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Judgment
22, 1956

No. 42 of 1955.

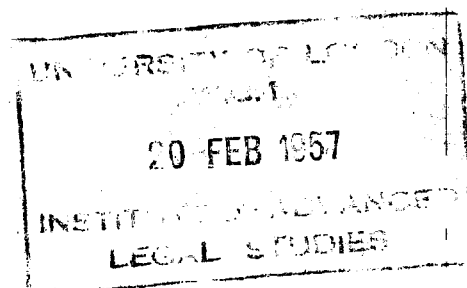
In the Privy Council.

ON APPEAL
FROM THE HIGH COURT OF AUSTRALIA

BETWEEN
HENRY GEORGE MARTIN (Plaintiff) *Appellant*
AND
SCRIBAL PROPRIETARY LIMITED (Defendant) *Respondent.*

RECORD OF PROCEEDINGS
(IN TWO VOLUMES)

VOLUME II
EXHIBITS
(Pages 231-352)



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In the Privy Council.

CITY OF LONDON
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ON APPEAL
FROM THE HIGH COURT OF AUSTRALIA.

20 FEB 1957

BETWEEN

HENRY GEORGE MARTIN (Plaintiff) *Appellant*

AND

SCRIBAL PROPRIETARY LIMITED (Defendant) *Respondent.*

RECORD OF PROCEEDINGS
VOLUME II

INDEX OF REFERENCE TO EXHIBITS

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	<i>Exhibits tendered by the Plaintiff :—</i>		
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B	Patent Specification No. 133163	31.12.1943	240
C	Original Application Patent No. 133163	31.12.1943	245
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D	Amended original Drawings	10.10.1944	261
E	Defendant's pen and carton referred to in Document No. 3 (to be produced)	Original exhibit	
F	Plaintiff's Notice to Admit and Defendant's Admission of Fact (see Documents Nos. 16 and 17)		
G	Alger's Report and Drawing relating to Exhibit " E "	4. 9.1950	265
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K	Laforest's Specification and Drawing.. .. .	Original exhibit	
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1	Patent Specification No. 122,073	8.12.1943	283
2	Exhibit 2. (Subject to the Ruling of His Honour Mr. Justice Sholl given on the 17th June 1953 and numbered 25 in the Index to Part I) :—		
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4	Defendant's Notice to Admit and Plaintiff's Admission of Fact (see Documents Nos. 18 and 19)		
5	Two writing instruments, one with ink	Original exhibit	
6	Exhibit 6. (Subject to the Ruling of His Honour Mr. Justice Sholl given on the 17th June 1953 and numbered 25 in the Index to Part I) :—		
	Letter from Patent Office to the Plaintiffs Patent Attorneys ..	19.10.1945	307
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II	Letter from the Plaintiff's Patent Attorneys to the Patent Office	18.12.1946	345
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In the Privy Council.

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RECORD OF PROCEEDINGS

10

VOLUME II

EXHIBITS.

Exhibit " A "—Dr. V. D. Hopper's Memorandum and Drawings.

PHYSICAL PRINCIPLES UNDERLYING ACTION OF THE BIRO PEN.

Exhibits.

A.
Dr. V. D.
Hopper's
Memoran-
dum and
Drawings.

To understand the operation of a ball pointed pen it is necessary to deal with the phenomena of surface tension and of viscosity. It will be convenient to discuss surface tension effects first and show how these enter into the action of the pen.

Surface Tension :

- 20 We often notice that certain insects are able to move about on the surface of water without sinking. They are held up by the resistance offered by the surface. It is possible to lay a thin sewing needle, previously slightly greased, upon the surface of water without it sinking. If we press the end of the needle so as to force it under the water the needle sinks. We can conclude from these observations that there is special property which occurs at the boundary of the liquid surface. If we pour a little mercury on the table we see that it forms small globules and the smallest ones are nearly perfect spheres. Small falling rain drops are also almost spherical in shape. Small bubbles of air in water are also
- 30 spherical and of course the ordinary soap bubble takes a spherical form. These results have been explained by assuming that the surface boundary is in a state of tension and this tends to reduce the surface to the smallest area. (The effect of gravity in the case of the larger mercury globules explains their non-sphericity).

Exhibits.

A.
 Dr. V. D.
 Hopper's
 Memorandum and
 Drawings,
continued.

A simple demonstration will illustrate that a liquid surface appears to be in a state of tension. (Fig. 1 and 2). If we dip a closed wire frame into a soap solution and then withdraw it the surface of the ring is covered with a very thin liquid film. A short loop of thread attached to the ring assumes an irregular shape as shown in Fig. 1. If the film is then broken inside the loop the latter springs out into a circle because the liquid particles outside the loop exert an even pull from all sides upon it, as shown in Fig. 2.

The magnitude of this surface tension can be measured by a simple experiment. A piece of wire ABCD is bent into the shape shown in Fig. 3. 10
 A thin wire EF is laid loosely across the horizontal frame and close to BC. This cross wire contains a small pan for holding weights. A little soap solution is brought between the frame and the cross wire by means of a small brush. When the whole apparatus is brought into the vertical position shown in the figure the movable cross wire does not fall away but is held up by the soap film. The movable wire is then loaded until the total weight just balances the maximum pull exerted by the film. The surface tension of the liquid is then equal to the total weight divided by twice the length EF (since the film has two surfaces). That is, the 20
 surface tension is defined as the magnitude of the force which acts in the liquid surface perpendicular to a line of unit length.

The magnitude of the surface tension of water at room temperature is about 75 dynes per centimetre i.e. less than 1/100 oz. per inch. For ball point pen ink it is about one half of this. Although this appears to be a very small quantity it exerts a considerable pressure effect when the surface of the liquid is curved.

Pressure difference created by a curved surface :

Let us blow two soap bubbles on two pipes as shown in Fig. 4. We make one large than the other and then connect them together so that the 30
 air can pass from one to the other. It will be noticed that the small bubble gets smaller, the air passing from this to the larger bubble. The explanation is that the pressure inside the smaller bubble is greater than that in the larger bubble. The pressure inside bubble A is greater than the outside air pressure and this difference can be shown to equal $\frac{4T}{r}$ where T is the surface tension of the liquid and r the radius of curvature of the surface. For the larger bubble the pressure inside that is also greater than outside air pressure and the difference in pressure is $\frac{4T}{R}$ where R is its radius. Since R is greater than r, the pressure inside B is less than the pressure inside A. When the two bubbles are connected the air in A passes to B 40
 until the radius of the meniscus at A is equal to that of the sphere at B (Fig. 5), i.e., the pressures are the same.

If we consider a small rain drop as shown in Fig. 6 where there is a single curved surface enclosing the liquid. The effect of the surface tension of the liquid is to cause an increase in pressure in the liquid relative to the air outside. The difference in pressure is now given by $\frac{2T}{r}$. The reason for $\frac{2T}{r}$ instead of $\frac{4T}{r}$ as in the earlier example is due to the fact that here we only have a single liquid-air surface contributing to the extra pressure. If we consider a small air bubble in a liquid (Fig. 7), the pressure

in the air inside the bubble is greater than the pressure in the liquid outside it and again this pressure difference is given by $\frac{2T}{r}$ since there is a single surface film separating the liquid from the air inside the bubble.

Exhibits.

A.
Dr. V. D.
Hopper's
Memoran-
dum and
Drawings,
continued.

An important conclusion can be drawn from these examples. Where we have a convex liquid-air surface as in the rain drop example, the pressure in the liquid is greater than the pressure of the air, but where we have a concave liquid-air surface, the pressure in the liquid is less than the pressure in the air. The pressure difference in each case is inversely proportional to the radius of curvature of the surface and is therefore very large for highly

10 curved surfaces.

If the small rain drop discussed above was distorted so as to be non-spherical, differences in pressure would be set up in different regions of the liquid owing to the different curvatures at the surface. The parts of the liquid would then move to equalize the pressure everywhere inside the small drop and it would recover its spherical shape. The smaller the drop the greater its resistance to deformation and an important consequence of surface tension is then the stability it gives to the liquid surface.

This pressure difference is not limited to drops or bubbles but is present whenever a liquid surface is curved.

20 *Liquid in contact with a solid :*

The effect of surface tension is attributed to the forces of attraction between the molecules of the liquid, and we refer to the attraction of liquid molecules with each other as cohesion. Just as the molecules of a liquid attract each other, there is also a corresponding attraction between the molecules of a liquid and those of a solid, e.g., of a wall in contact with it. This attraction is called adhesion. If adhesion is stronger than cohesion the liquid clings to the solid surface and forms a film on it.

If a small drop of water is placed on a horizontal glass surface we observe that it spreads over the surface and forms a small hillock as shown
30 in Fig. 8a. The angle between the surface of the liquid and the plate at the plate surface is called the angle of contact and is very small in the case of water on clean glass. Here the adhesion is large compared with the cohesion. In the case of a mercury globule on glass (see Fig. 8b) the angle of contact is large as cohesion is greater than adhesion for mercury on glass. The angle of contact of the ink used in the Biro pen relative to glass is also very small. If we place a sheet of glass vertically in water the liquid rises a little along the surface of the plate as in Fig. 9. It will be observed that the liquid makes the small angle of contact at the surface of the glass and also the liquid surface, for practical purposes, is horizontal at a distance
40 from the glass plate. In between, the liquid is curved making a concave liquid surface separating the liquid from the air. We remember that the pressure in the liquid immediately below a concave surface is less than the pressure of the air outside. The pressure at C is less than the pressure at A because there is a curved liquid-air surface at C but not at A. The pressure difference between C and A is balanced by the height of liquid between C and B, since the pressure at A and B are the same otherwise the liquid would not be at rest but would move along the line AB.

Exhibits. Rise of Liquid in a Capillary Tube :

A.
Dr. V. D.
Hopper's
Memoran-
dum and
Drawings,
continued.

If a series of glass tubes of diameters ranging from, say, 0.5 mm. to 5 mm. are held vertically in water it will be observed that the liquid rises in each tube. The rise is greatest in the tube with the smallest bore. We notice that the liquid surface in each tube is concave and the smaller the bore of the tube the greater the curvature of the meniscus. If the tube is not too large the result of the curve of the liquid up the tube wall is to produce a complete curve over the whole of the surface of the column. If the tube is wide enough the surface of the liquid in the centre of the tube will be practically flat, but as has been said, the smaller the tube the more marked the curvature. This result is indicated in Figs. 10a and 10b. 10

In Fig. 10a the pressure at A is less than the pressure in the air outside the meniscus and the difference is given by $\frac{2T}{r}$ where r is the radius of the meniscus at A. To satisfy the condition that the pressure along the line BDC is everywhere constant (otherwise the liquid would not be at rest) the liquid in the tube must take the position shown. The pressure difference between A and D is equal to the pressure created by the column of liquid above D.

In Fig. 10b the curvature at A is greater so that the pressure difference given by $\frac{2T}{r}$ is greater, and for equilibrium to be reached the liquid must rise higher in the narrower tube. Water will rise about 3.0 cm. in a clean glass tube of 1 mm. diameter, and only 1.5 cm. in a clean tube of 2 mm. diameter. 20

If we place a narrow tube shaped like a bottle with the top and bottom ends open into a liquid as shown in Fig. 11a we observe that the liquid rises a short distance up the tube as in the previous experiment. If, however, the tube is lowered until the liquid reaches the narrow part of the tube and then raised to the position shown in Fig. 11a we see that the height of the liquid reaches the same level as it would reach in a capillary tube of the same diameter as the narrow section of the tube. 30

Stability of a Liquid Column in a Tube open at both Ends to the Air :

So far we have been considering the behaviour of a column of water which is supported in a vertical tube by the pressure of the air upon the surface of the water into which it has been inserted. Let us now turn to a consideration of the behaviour of a column of water inside a tube open at both ends to the atmosphere. If we place water in a tube of uniform bore which is open to the air at both ends and hold the tube vertically, the water will slide down the tube. It will be observed that the meniscus at the two ends of the liquid column are of similar shape and are producing equal and opposite forces on the liquid column which balance each other. The remaining force of gravity acts on the liquid causing it to fall in the tube. (See Fig. 12a.) It is easy to see how the normal tendency of the column to fall out of the tube is affected by modifying the equality of the forces at the two surfaces of the liquid. If we close the top of the tube with a finger the column ceases to fall. The downward pressure of the air upon the top surface is reduced when the liquid falls a very small distance along the tube. This difference in pressure between the air in the closed section of 40

the tube and the air pressure at the bottom open end of the tube sets up a force which equals the weight of the water in the tube and the water does not fall any further.

Exhibits.

A.

Dr. V. D.
Hopper's
Memoran-
dum and
Drawings,
continued.

Now consider what happens if instead of closing the open end of the tube at the top we reduce the bore of the tube so that we have the situation as in Fig. 12b. The pressure in the liquid in the narrow tube at the uppermost portion is reduced in a somewhat similar way to that when we put our finger over the end of the tube with constant bore. The pressure at A is less than the pressure at B, the difference in pressure being
10 sufficient to hold up the liquid of height AB and cross sectional area corresponding to the dotted lines. The atmospheric pressure at C holds the remainder of the liquid in the tube. The smaller the diameter of the bore at A the greater will be the reduction of pressure at A and the longer will be the column of water that can be supported in the tube.

The Biro pen in effect consists of a tube acting as a reservoir for the ink with a small enough bore to produce a meniscus or curved surface with sufficient stability. This is connected to a narrower tube leading to the ball and housing. Between the ball and the housing there is a narrow circular gap. The meniscus with greater curvature is to be found between
20 the housing and the ball itself. The relative curvatures of the upper and lower menisci are such that the smaller one can support the column of ink. When the Biro pen is placed with the ball point upwards the result is similar to that shown in Fig. 12b, the narrow meniscus at A now being the meniscus between the ball and housing. In practical terms this means that the ink will not drop back bodily when the tube is inverted.

Before we leave this discussion on the effect of surface tension a final point is considered. If water is contained in a section of a capillary tube of uniform bore of 2 mm. diameter and the tube is held horizontal the water surfaces exposed to the air are concave and appear hemispherical.
30 Actually the water takes the shape shown in Fig. 13.

If a larger tube is used the points of contact with the surface at A and B move closer together and the points C and D move further apart. For a certain diameter of tube (about 5 mm. diameter) the water will run out of the tube along the bottom section CD. The rate at which it flows out and the manner of flow will be governed by the viscosity of the liquid which will be discussed later. This means that for the liquid to be stable in the reservoir the diameter of the tube should be less than about 5 millimetres.

Conclusion :

40 In a Biro pen, capillary forces are in the first place utilized to maintain the liquid column of ink in a certain position within the instrument—

(A) To maintain the liquid column at the writing end and to prevent it from dropping back bodily when the tube is inverted, and

(B) to maintain the continuity of the ink column in the reservoir by providing a meniscus which is strong enough to resist sudden shocks and also prevents the local disruption of the column leading to running out.

Exhibits.

VISCOSITY AND SURFACE TENSION.

A.
 Dr. V. D.
 Hopper's
 Memorandum and
 Drawings,
continued.

Ball point pens use viscous inks which have proved to be more suitable than aqueous inks. The viscosity of a liquid is its resistance to flow, e.g. when stirring or pouring it. Though this property intimately co-operates with the surface tension in the functioning of a ball point pen, the two properties are completely independent of one another. This co-operation is very effective due to the very high viscosity of ball pen inks which have the consistency of a paste and are about 10,000 times more viscous than aqueous inks. Their resistance to flow is therefore very high, and this materially assists in maintaining an unbroken column of ink in a capillary tube reservoir. 10

In spite of this assistance the high viscosity as such could not be relied upon to prevent the running out of a liquid from a tube. Viscosity cannot stop flow, it can only delay it. Only the effect of surface tension can stop flow completely.

This delaying action is, however, paramount in preventing the breaking up of the meniscus at the rear end of the ink column under the influence of shocks which are unavoidable in the use of writing instruments. One may say that the tension of the meniscus and the viscosity of the ink are co-operating like a spring and its shock absorber. The latter provides the cushion against large forces which, though acting only for a very short period, would break the spring. 20

The effect of viscosity can be illustrated by observing the difference between a glass of water and a glass of honey, when moved about. Both have approximately the same surface tension, but their viscosities are about as different as those of aqueous inks and ball pen inks. The slightest shock or wrong movement will lead to water splashing out of the glass. The glass filled with honey can be subjected to violent shocks or very rapid movements without significant disturbance. On the other hand, if given sufficient time, even small forces, as the liquid's own weight, are sufficient to make it flow, however slowly. 30

Melbourne.

June, 1953.

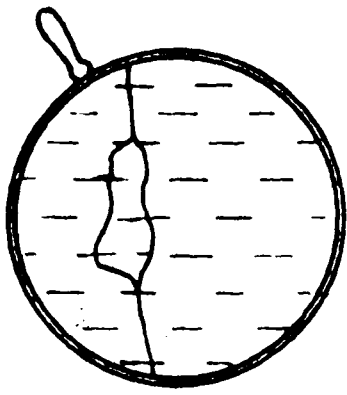


Fig. 1. Film covers all the area inside ring.

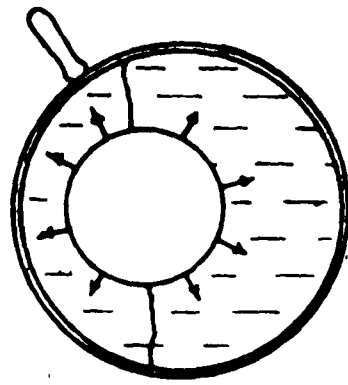


Fig. 2. Film removed from inside loop arrows indicate direction of surface tension.

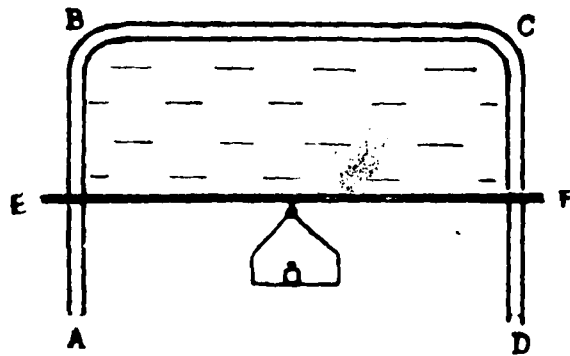


Fig. 3.

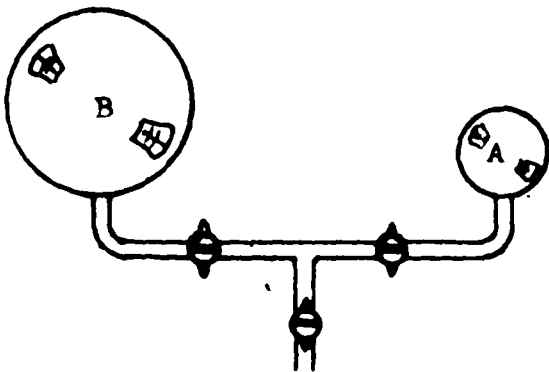


Fig. 4.

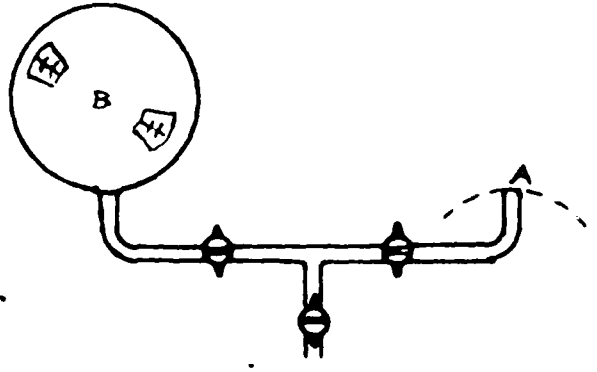


Fig. 5.

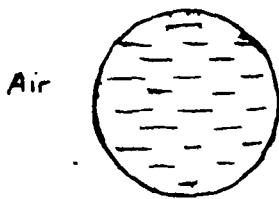


Fig. 6. Pressure in the liquid higher than in air

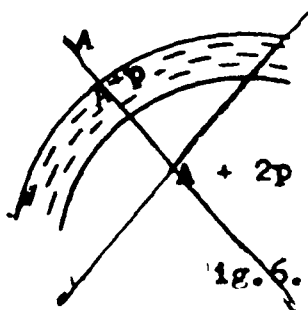


Fig. 6.

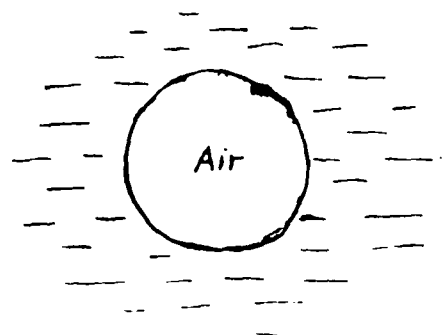


Fig. 7 Pressure in the liquid less than in air.

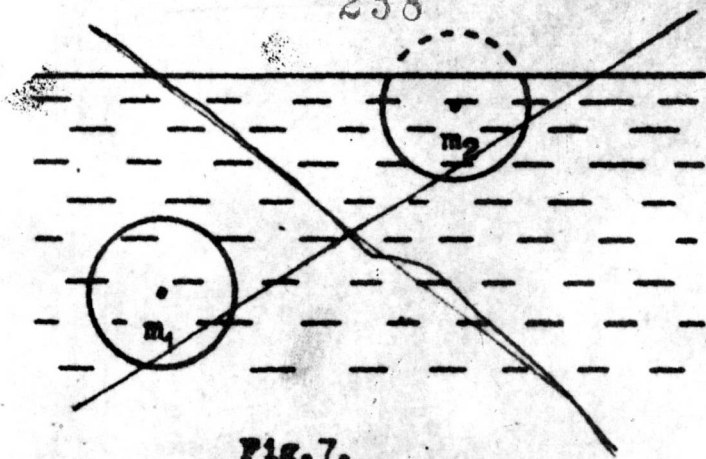


Fig. 7.



Fig. 8a.

For water on glass, θ , the angle of contact is very small. This is also true for the ink used in the Biro pen.

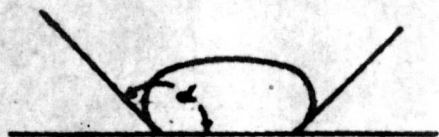


Fig. 8b.

Mercury on glass. The angle of contact is about 145° .

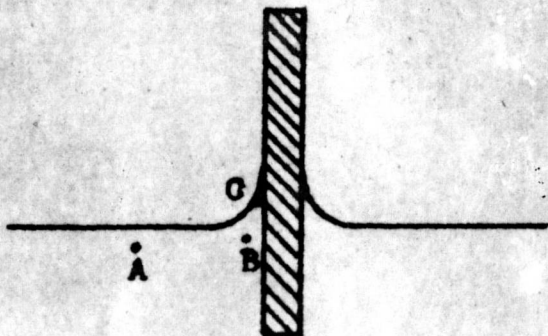
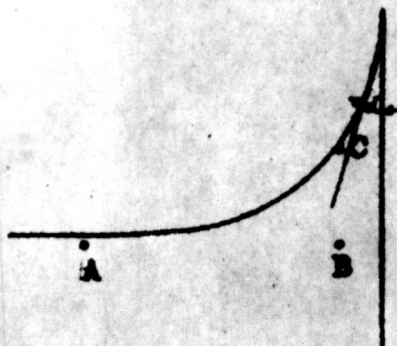
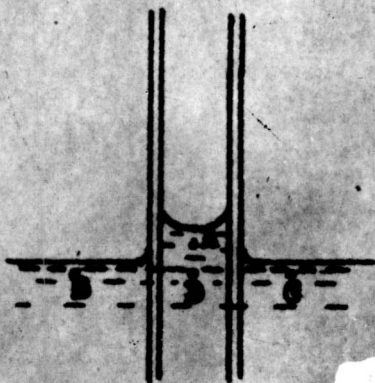
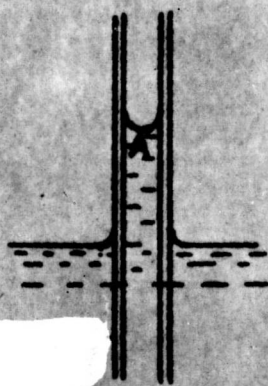


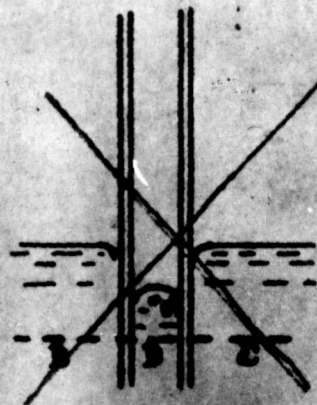
Fig. 9. Water rise at surface of glass plate.



(a)



(b)



(c)

Fig. 10

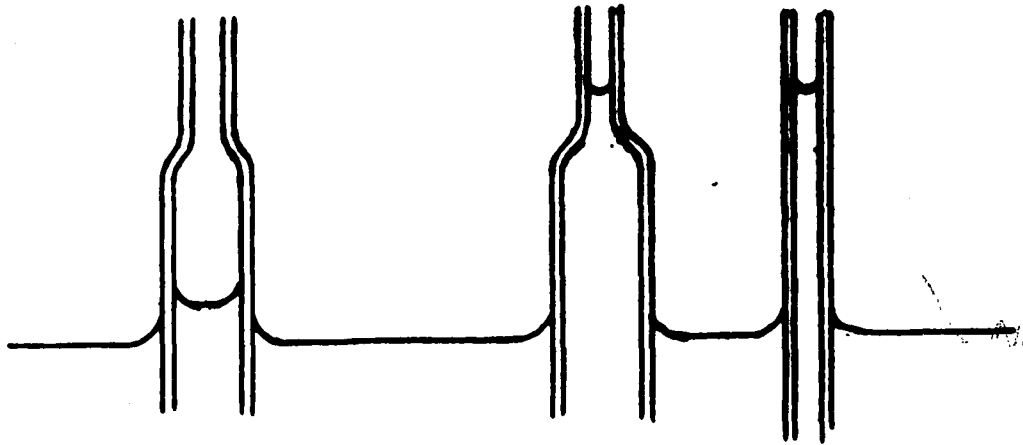


Fig.11a.

Fig.11b.

(a) Tube inserted in water showing rise due to the radius of the large section of tube.
 (b) Result when liquid is immersed until liquid reaches narrow part of the tube and is then raised to the position shown in Figure 11b.

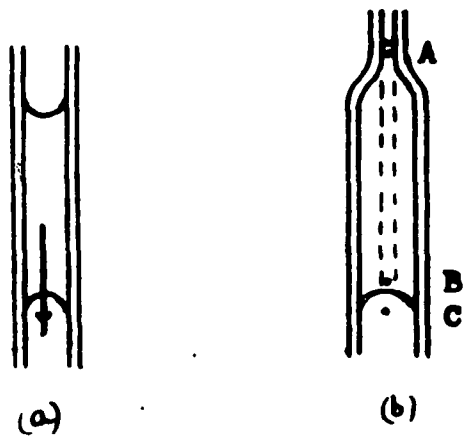


Fig.12. Liquid in tube held vertically in air.

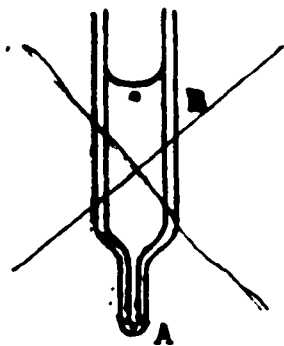


Fig.13.



Fig. 14.

Exhibit B - Patent Specification No 133163

COMMONWEALTH OF AUSTRALIA

PATENT SPECIFICATION

133,163

Application Date: 31st December, 1943. No. 12,499/43.

Complete Specification Published 19th February, 1948.
Complete Specification Accepted 14th June, 1949.

*Patent
No 133163
31 Dec 1943*

Class: 49.1.

Drawing attached.

COMPLETE SPECIFICATION.

"Improvements in writing instruments."

I, HENRY GEORGE MARTIN, British Subject, Public Accountant, resident of Avenida Roque Saenz Pena, No. 547, Buenos Aires, Argentina, whose Post-Office address is Avenida Roque Saenz Pena No. 547, Buenos Aires, Argentina, hereby declare this invention and the manner in which it is to be performed to be fully described and ascertained in and by the following statement:

This invention relates to writing instruments of the type in which a ball is mounted for rotation in a housing with part of the ball exposed and is supplied with ink from a suitable reservoir, the arrangement being such that as the ball is rotated such as by being moved relatively to and in contact with a writing surface the ball carries a quantity of ink through the housing, which ink is deposited on said surface and a trace is made.

An object of the present invention is to improve the construction of instruments of the aforesaid type. According to this invention, I provide an instrument of the type specified, having the ink reservoir constituted by a vented tube of cap-

illary size in which when charged with viscous ink a continuous liquid vein is maintained extending from the ball, and having a feed duct leading from the reservoir to the ball, the cross sectional area of which duct, particularly that portion adjacent the ball, being less than that of the reservoir. The expression 'a vented tube of capillary size' is employed herein in relation to the reservoir of a writing instrument of the type specified to mean a tube having an internal bore of between 1 and 4 m.m. (subject to a manufacturing tolerance of the order of +, -, 5%) so that when charged with a viscous ink the meniscus formed at the end of the ink column remote from the ball (at the interface between the ink, the air and the interior surface of the tube) is stable and will not break under shocks to which the instrument is subjected in normal use.

The tube is preferably in the form of a series of limbs, each substantially parallel to the longitudinal axis of the instrument so that a comparatively long length of continuous tube can be accommodated in a comparatively small compass such as the

usual type of fountain pen casing. The term "tube" as used herein where the context so permits includes a tube like duct formed in a body.

In order that the nature of the invention may be more readily understood reference will now be made to the accompanying drawings in which:—

Figure 1 is a cross sectional view illustrating by way of example one embodiment of the present invention.

Figure 2 is a diagrammatic representation of the embodiment illustrated in Fig. 1.

Figure 3 is a cross sectional view illustrating another embodiment.

Figure 4 is a cross section on line N-N Fig. 3.

Figure 5 is a cross section on line S-S Fig. 3.

Figure 6 is a diagrammatic representation of the embodiment illustrated in Figs. 3, 4 and 5.

The same numbers and letters of reference have been used to indicate like or corresponding parts in all the several views.

As will be seen by referring to the drawing a is the body part of the pen or holder, terminating in a point 1, whereat by means of a suitable housing 2, the small sphere or ball 3 which forms the writing element is rotatably mounted with part of the ball exposed; said ball is in contact with the ink supplied by the feed duct 4 which, in turn, receives its supply from the reservoir b. The feed duct 4, or at least that portion adjacent the ball, is of lesser sectional area than that of the reservoir, as indicated in Figures 2, 3 and 6, where reference 4a denotes the relatively smaller cross sectional portion of the feed duct. Similarly that portion of the feed duct of Figure 1 extending from a position such, for example, as indicated by line A to the ball recess will be of smaller cross section than that of the reservoir.

While the ball may be of any appropriate size, it is preferably of a diameter in the order of 1m.m.

The reservoir b is formed by a duct, forming an extension of the feed duct 4, constituted by a plurality of lengths or

duct sections 5, preferably arranged in parallel relationship to the longitudinal axis of the body of the holder a; the reservoir thus forms a series or group of duct sections occupying the greater part of the body a; said sections 5 are connected together and communicate in series, one in continuation of the other, so as to form, as a whole, one single channel, commencing at the inlet or air intake 6 and ending at the feed duct 4 of the ball 3.

This invention is adapted for construction in many ways, among which are to be particularly noted the embodiments shown in the several Figures of the accompanying drawings.

In the embodiment according to Fig. 1, the reservoir b is formed by a tube of capillary size which, being connected to the feed channel 4, extends parallel to the holder a, and as the tube is folded several times by a bend through 180°, the same will form a group of several sections 5 of reduced length with the bends 5' establishing communication between the several sections, so that all of the sections are connected in series. The ink reservoir b is removably housed within the holder a, which in this case is hollow.

The duct which forms the reservoir b is filled with a viscous or semi-fluid ink, thus establishing a fluid vein extending when the reservoir is full from a point near the inlet or air intake 6 to the ball 3, which is in contact with the ink; consequently when the ball is rotated such as by being rolled over a suitable surface, the ball will make a trace with the ink supplied from the said liquid vein.

In the embodiment of Figs. 3, 4, 5 and 6 the reservoir b is also formed by lengths or sections 5, but in this case, said sections are constituted by ducts formed in the body of the holder a.

Said ducts extend longitudinally in a parallel arrangement, and are closed at both ends, such as by means of the head piece c, constituting the point 1, and the head piece d. The head piece c is threaded at 7 into the body a, while the part d is threaded at 8 into said body a, as may be seen by referring to Fig. 3.

As shown, the channel sections 5 are enabled to communicate with each other, by means of passages 5', so that all the sections together form a continuous single linear duct.

One of the duct sections, indicated at 5'', ends with an air intake 6 preferably directed towards the point 1, but at a certain distance short of the same.

In the embodiment illustrated in Figs. 3, 4, 5 and 6, when the instrument is filled with ink, a liquid vein is established which extends without interruption up to the ball 3.

In all the embodiments the duct is charged with a viscous ink so that a continuous liquid vein is formed communicating with the ball 3.

It will be evident that in carrying the invention into practice, modifications may be introduced with regard to certain details of construction and shape of the instrument, without departing from the basic principles of the invention as set forth in the claims hereto annexed.

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:

1. An instrument of the type specified, having the ink reservoir constituted by a vented tube of capillary size in which when charged with viscous ink a continuous liquid vein is maintained extending from the ball, and having a feed duct leading from the reservoir to the ball, the cross sectional area of which duct, particularly that portion adjacent the ball, being less than that of the reservoir.

2. An instrument according to Claim 1 in which the tube is open to atmosphere at one end and the other end communicates with the ball.

5

3. An instrument according to any of the foregoing claims in which the tube is formed into limbs, substantially parallel to the longitudinal axis of the instrument.

4. An instrument according to Claim 3 in which the open end of the tube is directed towards but does not extend to the ball.

5. An instrument according to any of the foregoing claims in which the ink reservoir is adapted to be removably received within a casing.

6. An instrument according to any of the Claims 1 to 5 in which the tube is constituted by a duct formed in a body.

7. An instrument according to Claim 6 in which a series of parallel ducts is formed in a body positioned within an outer casing, said ducts being each connected by a passage, an end closure being provided (removably or otherwise) at each end of said body, one end of one duct being open to atmosphere and the arrangement and disposition of the parts being such that there is formed a single linear duct extending from the opening to atmosphere to the ball.

8. An instrument according to any of the foregoing claims when charged with a viscous or semi-fluid ink.

9. An instrument constructed and arranged substantially as described herein with reference to the accompanying drawings.

Dated this 18th day of December, 1946.

HENRY GEORGE MARTIN,

By His Patent Attorneys:
PHILLIPS, ORMONDE, LE PLASTRIER
& KELSON.

CECIL W. LEPLASTRIER,

Witness:—L. Spinks.

6

EXHIBITS.

**Exhibit " C "—Original Application.
Patent No. 133163.**

C.
Original
Application
Patent
No. 133163,
31st
December
1943.

133163
12499133163 ⁽²⁾ Australia

Referred to Examiner
C. S. TEECE
Commissioner of Patents
- 4 JAN 1944

COMMONWEALTH
31 DEC 1943

COMMONWEALTH OF AUSTRALIA
The Patents Act 1903-1935

RECEIVED
31 DEC 1943

APPLICATION FOR A PATENT

Subject

I, HENRY GEORGE MARTIN, British/Public Accountant, resident of Avenida Roque Saenz Peña N° 547, Buenos Aires, Argentina, whose Post-Office address is Avenida Roque Saenz Peña N° 547, Buenos Aires, Argentina, hereby apply that a Patent may be granted to me for an invention entitled "IMPROVEMENTS IN WRITING INSTRUMENTS", ~~details of which are attached hereto~~ and I do hereby declare that I am the assignee of LASZLO JOZSEF BAKO, resident of Oro Street N° 3040, Buenos Aires, Argentina, actual inventor of the invention, and I verily believe that I am entitled to such Patent under the provisions of the Patents Act ~~1903-1935~~ 1903-1935. And I further declare that I am in possession of the said invention, and that it is not in use within the Commonwealth of Australia by any other person or persons to the best of my knowledge and belief.

1911

RECEIVED
Date 31 DEC 1943
Time 10
13 : Receipt 12499
Application
Specification *Complete*
12 sheets
Drawings 3 sheets
66

AND I make this declaration, conscientiously believing it to be true.

Dated at Buenos Aires, Argentina, this 27th day of November, 1943.

Signed by the said
Henry George Martin
in the presence of:
Harris

Henry George Martin
(Signature of Applicant)

TO THE
Commissioner of Patents
Commonwealth of Australia.

I accept the Application
Deputy Commissioner of Patents
1 JUN 1944

1249943

133168

COMMONWEALTH OF AUSTRALIA
Patents Act 1903.

COMMONWEALTH
31 DEC 1913

APPOINTMENT OF AGENT AND OF ADDRESS FOR SERVICE

KNOW you that I, HENRY GEORGE MARTIN, English, Public Accountant, resident of Avenida Roque Saenz Peña N° 547, Buenos Aires, Argentina, whose Post Office address is Avenida Roque Saenz Peña N° 547, Buenos Aires, Argentina, hereby nominate, constitute and appoint Messrs. PHILLIPS, RONALD, LE PLASTRIER & KELSON, of 419, Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia, Registered Patent Attorneys, my Agents with full powers of substitution and revocation to obtain Letters Patent in the Commonwealth of Australia in my favour for my invention entitled: "IMPROVEMENTS IN WRITING INSTRUMENTS", and for that purpose to sign my name and as my act and deed to seal and deliver all documents (except such as are required by the Patent Act now in force and regulations to be executed by me, that my said Agents may think necessary or desirable, and I further empower my said Agents to alter and amend such documents whether originally executed by me or otherwise in any manner that may be necessary and authorize and request you to send all notices, requisitions and communications in connection with my said application to them at their address as above given.

Dated at Buenos Aires, Argentina, this 27th day of November, 1913.

Signed, Sealed and Delivered by the)

said Henry George Martin

Henry George Martin

in the presence of:

Augh Harris

TO THE
Commissioner of Patents
Commonwealth of Australia.

EXHIBITS.

Exhibits.

Exhibit " C "—Original Specification No. 133163.

Referred to Examiner
C. S. TEECE
Commissioner of Patents
4 Jan. 1944

Commonwealth
31 Dec. 1943
Patent Office

C.
Original
Specifica-
tion
No. 133163,
31st
December
1943,

133163

Original Specification No. 133163 Exhibit 3

10

(Patents)

COMMONWEALTH OF AUSTRALIA

Form C

THE PATENTS ACT 1903-1935

COMPLETE SPECIFICATION

" IMPROVEMENTS IN WRITING INSTRUMENTS "

I, HENRY GEORGE MARTIN, British Subject, Public Accountant,
resident of Avenida Roque Sanes Pena No. 547, Buenos Aires,
Argentina, whose Post-Office address is Avenida Roque Sanes
Pena No. 547, Buenos Aires, Argentina, hereby declare this invention,
and the manner in which it is to be performed to be fully described
and ascertained in and by the following statement :—

20

This invention relates to fountain pens and refers more particularly
to fountain pens of the kind which comprise an ink reservoir formed by an
extension of the channel for supplying the writing point with ink, a system
which by itself has yielded convenient results, although under certain
conditions of arrangement only, which should duly be taken into account
when considering the further development of the industry.

30

In fact, the extension of the feed channel for constituting the reservoir
by means of a duct of small section, allows of establishing a fluid vein of
constant position, after the manner of an automatically replaceable lead
rod in a pencil, but, in the provision of a duct of a certain length adapted
to be fed with a relatively ample amount, several difficulties are encountered,
owing to the necessity of arranging the duct in a winding or meandering
form, or of otherwise arranging the same in such a way that it will occupy
to the largest possible extent the capacity of the holder of the instrument.

In accordance with this invention, these difficulties are overcome
in a rather simple way, thereby allowing of the manufacture of fountain
pens at a low cost and adapted to receive a charge of considerable yield
and duration.

40

For this purpose, a feed channel consisting of several sections is
provided, so arranged that the whole of the sections will form a series or
group of duct sections, conveniently fitted in the body of the holder, thereby
using the space to the best advantage.

Exhibits.
 C.
 Original
 Specification
 No. 133163,
 31st
 December
 1943,
continued.

To this end, the duct sections, which form the ink reservoir, are connected together and communicate in series by means of passages leading from one section into the other, and as said sections are longitudinal and preferably parallel to the axis of the pen, the whole of the sections will be of a length several times that of the holder.

The duct consisting of a plurality of sections for forming the reservoir may be constructed in several manners, as use may be made in differently of a capillary tube folded into several lengths until forming a series or whole, or a group of channels or ducts may be bored in a block which may then be connected to, or form an integral part of the fountain pen, provided 10 the several sections of the duct be connected in series, so that one will be a continuation of another.

Besides the objects above stated, this invention also has other aims in view, among which is to be noted a reservoir in the shape of a vein of great length, with a minimum number of bends and occupying most of the body part of the holder of the fountain pen.

A further object consists in simplifying the construction of the instrument by arranging the ink reservoir as a channel which by forming an extension of the feed duct for the stylographic ball or point, will constitute the longitudinal sections by simply bending or folding the same 20 into a block.

Another object tends to secure a simple arrangement of the reservoir, by the provision of simple boring designed to form the ducts which communicate in series, one a continuation of the other.

A further object of the invention consists in using the very material of the holder of the pen as a basis in which to provide the channels or longitudinal sections which form the ink reservoir.

A still further object consists in preventing gravitation from influencing the reserved position of the instrument, for which purpose the end of the air intake of the duct is positioned to project toward the writing point 30 of the pen.

Other objects of the invention will appear when considering the detailed description of the same, which for purposes of clearness and ready understanding has been illustrated in several Figures showing, by way of example, some preferred embodiments of the improved fountain pen. In said drawings :

Fig. 1 illustrates a general view of the arrangement of the fountain pen, showing in particular the series or group of tubular sections which, by communicating in series, form the ink reservoir which occupies the greater part of the body of the holder: in this case, the ink reservoir 40 consists of a tube bent into sections grouped to form a series.

Fig. 2 is a diagrammatic representation of the embodiment shown in Figure 1, illustrating the manner of establishing a communication in series between the several sections of the duct, one a continuation of the other.

Fig. 3 shows a longitudinal section of another design of fountain pen, wherein the group of duct sections is constituted by longitudinal borings

provided in the very body of the holder, said duct sections being connected one to another in continuous communication, in order to obtain the series for forming the fluid vein when filling the same with ink.

Fig. 4 illustrates a cross section on the line N-N of Figure 3, showing the manner of communicating the several sections by means of passages, for obtaining the series and forming the duct which is to constitute the ink reservoir.

Fig. 5 shows a cross section on the line S-S Figure 3, illustrating the opposite part of the communications between the sections which forms the series or whole of the duct.

Fig. 6 is a diagrammatic representation of the embodiment of Figures 3, 4 and 5, giving a clear idea of the group of duct sections which by continuous communication of one with another form the series which constitute the duct serving as an ink reservoir.

Fig. 7 shows a perspective of another embodiment of the invention consisting of a group or series of duct sections formed by a striated body placed within a jacket or envelope which forms the body of the pen holder, said sections inter-communicating by means of passages by which to secure the arrangement in series for obtaining an ink reservoir in shape of the whole of the ducts : and finally,

Fig. 8 is a cross section of the body of the pen, according to the construction shown in the foregoing Figure 7.

The same numbers and letters of reference have been used to indicate like or corresponding parts in all the several views.

As will be seen by referring to the drawings, *a* is the body part of the pen or holder, properly ending with a point 1, at which, by means of a suitable mounting 2, the small sphere or ball 3 is adapted, which forms the writing element, said sphere being in contact with the ink supplied by the feed channel 4 which, in turn, receives its supply from the reservoir *b*.

As already stated before, the reservoir *b* is formed by a duct forming an extension of the feed channel 4, but comprising several particular features which constitute the basis of this invention.

In fact, said reservoir *b* is formed by a linear duct, constituted by a plurality of lengths or duct sections 5, preferably arranged as a whole and parallel to the body of the holder *a*, thus forming a series or group of duct sections which together occupy the greater part of the body *a* : said sections 5 are connected together and communicate in series, one in continuation of the other, so as to form, as a whole, one single channel commencing at the inlet or air intake 6 and ending at the feed duct 4 of the sphere 3.

This invention is adapted for construction in many ways, among which are to be particularly noted the embodiments shown in the several Figures of the accompanying drawings.

In the embodiment according to Figure 1, the reservoir *b* is formed by a duct or tube of the capillary type, which, being connected to the feed channel 4, extends parallel to the holder *a*, and as the tube is folded several times by a bend through 180°, the same will form a group of reduced length

Exhibits.

C.

Original
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tion
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 Original
 Specification
 No. 133163,
 31st
 December
 1943,
continued.

formed by several sections 5, with the bends 5' establishing communication between the several sections, so that all of the same will be connected in series. The whole of sections 5 forms a series housed within the holder *a*, which in this case is hollow.

The duct which forms the reservoir *b* is filled with a dense or semi-fluid ink, thus establishing a fluid vein extending from a point near the inlet or air intake 6 to the sphere 3, which is thus maintained in contact with the ink, in order that when causing the same to roll over a suitable surface, the sphere held by its mounting 2, will mark the strokes with the ink supplied from the channel containing said liquid vein.

10

In the embodiment of Figures 3, 4 and 5 the reservoir *b* is also formed by lengths or sections 5, but in this case, said sections are established by borings provided in the body of the holder *a*.

Said borings extend longitudinally in a parallel arrangement, so that the whole of sections or ducts 5 will form a group. The borings or sections 5 are closed at both ends, viz. : by means of the head piece *c*, corresponding with the point 1, and the head piece *d* which forms a sort of butt. The body part *c* is threaded at 7 into the body *a*, while the body *d* is threaded at 8 into said body *a*, as may be seen when referring to Figure 3.

In spite of the closure established by the body parts *c* and *d*, the channel sections 5 are enabled to communicate with each other, although in a particular manner, that is to say, each section 5 communicates with another section by means of a passage 5', so that all the sections will form a continuation in series, wherein the duct sections 5 will be connected, as shown in Figure 6, in continuation one with another by means of said passages 5' and thus form one single linear duct.

One of the duct sections, indicated at 5", ends with an inlet 6 which forms an air intake, directed towards the end of the point 1, but at a certain distance short of the same : this arrangement has for its object the prevention of the ink, when the pen is in a reversed position from being discharged by gravitation, whilst the section situated along the axial line of the instrument is that which is in direct communication with the feed duct 4.

In the embodiment in accordance with Figures 3, 4, 5 and 6, when filling the reservoir with ink, a liquid vein is established also in the corresponding duct, which must be maintained without interruption up to the sphere 3, in order to serve as a fountain for feeding the ink.

With reference, finally, to the embodiment shown in Figures 7 and 8, it will be seen that the reservoir *b* consists of a striated body *e*, arranged to fit snugly within the walls surrounding the cavity *a'* of the body *a*, which in this case is of tubular shape.

40

Said striated body *e* is formed with longitudinal grooves which together with the walls of the cavity *a'* constitute the duct section 5, thus arranged to form a group or series.

In the case shown in Figures 7 and 8, the whole of the striated body *e* fitted in the envelope *a*, is complemented by the body parts *c* and *d*, connected thereto by screwing at 7 and 8, in a manner similar to that

shown in Fig. 3: and the same as in the former case, the duct sections 5 communicate one with another in series, so as to obtain a linear duct for forming the reservoir *b*. The body *a* is axially provided with a bore which, by communicating in series with the other sections, forms the last section 5, for connection to the feed duct 4 which ends at the sphere 3.

As in the foregoing cases, this embodiment is charged with a dense ink, so as to establish a continual liquid vein, ending at the mounting piece of the sphere 3, for feeding the latter as a fountain pen.

From the foregoing description, it will be seen that the invention substantially consists in the provision of sectional ducts 5, arranged as a whole to form a series or group, by means of bends or passages 5', said duct sections communicating in series, one in continuation of another, so that the whole of duct sections will form one single duct, commencing at an inlet hole 6 and ending at a feed duct 4, connected to the mounting of the sphere, said duct constituting the reservoir *b*, to be filled with a dense or semi-fluid ink and to form therewith an uninterrupted liquid vein, extending to the mounting 2 of the sphere 3. Said duct sections may be formed by lengths of tubes, borings or by a combination of such elements, as illustrated by the embodiments shown in the several Figures of the accompanying drawings.

It should be understood that instead of a sphere, the stylographic point may comprise a pen or other common or known writing means.

It will also be evident that in carrying the invention into practice, modifications may be introduced with regard to certain details of construction and shape of the fountain pen, without departing from the basic principles of the invention, to be clearly set forth in the claims hereto annexed.

Having now particularly fully described and ascertained the nature of the my said invention and the manner in which the same it is to be performed, what is claimed and desires to secure by Letters Patent, is:—
I declare that what I claim is:—

1. Fountain pen, of the type in which the ink reservoir is an extension duct of the feed channel for the stylographic point, characterized by the fact that the duct which forms the ink reservoir consists of a series or group of duct sections, provided with means for communicating in series one section with another, so as to form one single linear duct or channel, extending from an inlet open to the air, to the feed channel of said stylographic point.

2. Fountain pen, in which the duct, which constitutes the ink reservoir, is formed by a series or group of duct sections connected together and communicating in series by means of communication passages from one section to another, so as to form one single channel, from the inlet, open to the air, to the feed channel of the stylographic point, characterized by the duct sections being arranged parallel one to another and longitudinally within the body of the pen holder, said sections being, in turn, parallel to the axis of said body of the holder.

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No. 133163,
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Exhibits.

C.

Original
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No. 133163,
31st
December
1943,
continued.

3. Fountain pen, in which the duct which constitutes the ink reservoir consists of a series or group of duct sections, connected together and communicating in series by communication passages extending from one section to another so as to form one single channel from an inlet open to the air to feed channel of the stylographic point, characterized by the fact that the inlet or air intake of the duct which forms the reservoir, is directed towards the stylographic point at a certain distance from the same.

4. Fountain pen, in which the duct which constitutes the ink reservoir consists of a group or series of duct sections connected together and communicating in series by communication passages from one section to another, so as to form one single channel from an inlet open to the air to the feed channel of the stylographic point, characterized by the fact that the series or group forming the whole of the duct sections of the ink reservoir occupies the greater part of the body of the holder proper of the fountain pen. 10

5. Fountain pen, in which the duct which constitutes the ink reservoir consists of a group or series of duct sections, connected together and communicating in series by means of communication passages from one section to another, so as to form one single channel extending from an inlet open to the air, to the feed channel of the stylographic point, characterized by the fact that the duct sections which form the general duct or reservoir proper consist of a tube folded several times with bends of 180° into sections of a length somewhat smaller than that of the holder of the pen, said sections being arranged as a whole so as to form the series or group housed within the cavity of the holder of the fountain pen. 20

6. Fountain pen, in which the duct which constitutes the ink reservoir consists of a series or group of duct sections, connected together and communicating in series by means of communication passages, from one section to another, so as to form one single channel, extending from an inlet open to the air, to the feed channel of the stylographic point, characterized by the fact that the duct sections which form the general duct or reservoir proper consist of bores formed in the body of the pen holder, which, being arranged jointly, communicate with each other by their ends, so as to constitute a linear channel. 30

7. Fountain pen, in which the duct which constitutes the ink reservoir consists of a series or group of duct sections, connected together and communicating in series one with another by means of communication passages extending from one section to the other so as to form one single channel extending from an inlet open to the air, to the feed channel of the stylographic point, characterized by the fact that the communication passages of the duct sections are formed by recesses complemented by head pieces at both ends of the main body part of the holder of the fountain pen. 40

8. Fountain pen, in which the duct which constitutes the ink reservoir consists of a series or group of duct sections, connected together and communicating in series by means of communication passages extending

from one section to another, so as to form one single channel, extending from an inlet open to the air, to the feed channel of the stylographic point, characterized by the fact that the duct sections which form the general channel or reservoir proper, are constituted by longitudinal grooves formed in a body enclosed within the cavity of the holder, said grooves being provided at their ends with recesses which form the communication passages from one section to another.

Exhibits.
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C.
Original
Specifica-
tion
No. 133163,
31st
December
1943,
continued.

9. Fountain pen, in which the duct which constitutes the ink reservoir consists of a series or group of duct sections, connected together and
10 communicating in series by means of communication passages extending from one section to another, so as to form one single channel, extending from an inlet open to the air, to the feed channel of the stylographic point, characterized by comprising a striated body housed within the holder, said strias or grooves forming the duct sections provided with communication passages extending from one to another, so as to constitute a general duct or channel, the whole of the grooves being headed by body parts adapted to both ends of the main body part of the holder of the fountain pen.

10. Fountain pen, in which the duct which constitutes the ink
20 reservoir consists of a series or group of duct sections, connected together and communicating in series by means of communication passages extending from one section to another so as to form one single channel extending from an inlet open to the air to the feed channel of the stylographic point characterized by the fact that the channel or duct which forms the reservoir ends with a mounting provided with a small loose sphere which constitutes the writing point.

11. Fountain pen, in which the duct which constitutes the ink
30 reservoir consists of a series or group of duct sections, connected together and communicating in series by means of communication passages extending from one section to another, so as to form one single duct or channel, extending from an inlet open to the air, to the feed channel of the stylographic point, with a charge of dense ink filling the entire extension of said general duct formed by said sections, said charge constituting an uninterrupted liquid vein extending to the stylographic point, all as above described, for the purpose set forth and with reference to the accompanying drawings.

Dated this 30th day of December A.D. 1943.

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

40

PHILLIPS, ORMONDE LE PLASTRIER & KELSON.
Cecil Le Plastrier.

L. SPINKS,
Witness.

EXHIBITS.

Exhibit " C "—Original Drawings No. 133163.

Exhibits.

C.
Original
Drawings
No. 133163,
31st
December
1943.

Exhibit C
Animal Drawings

Fig. 1

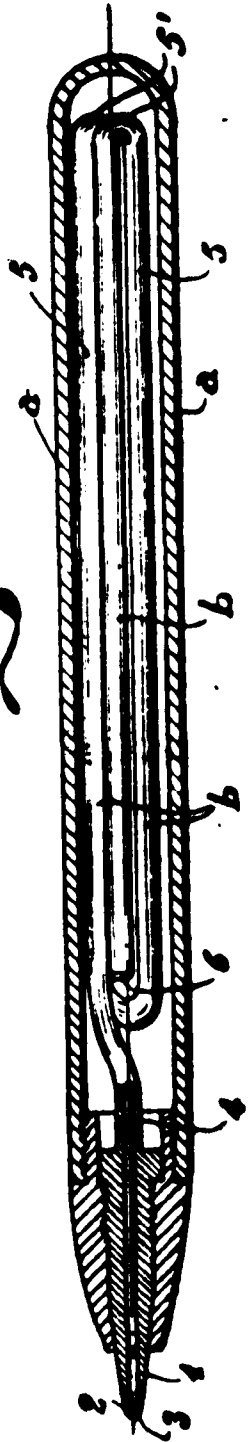


Fig. 2



Fig. 4

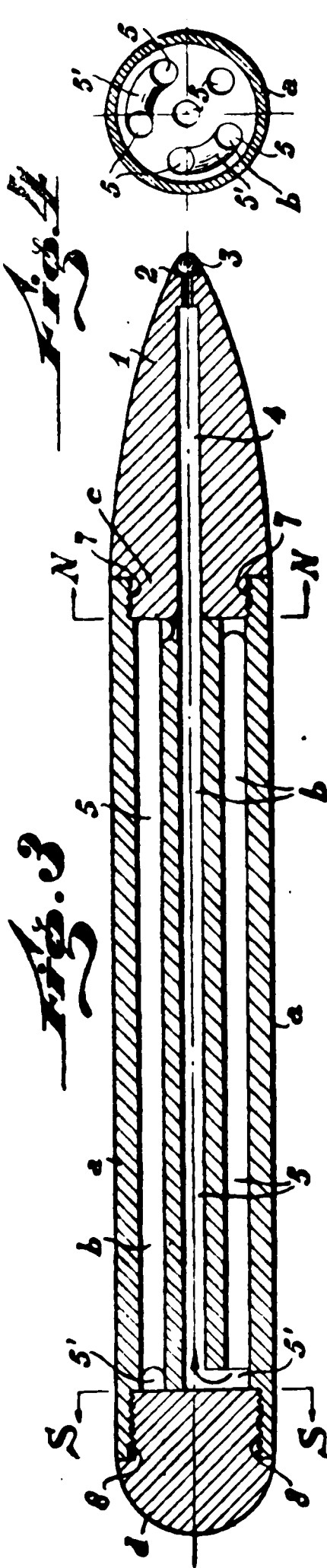


Fig. 5

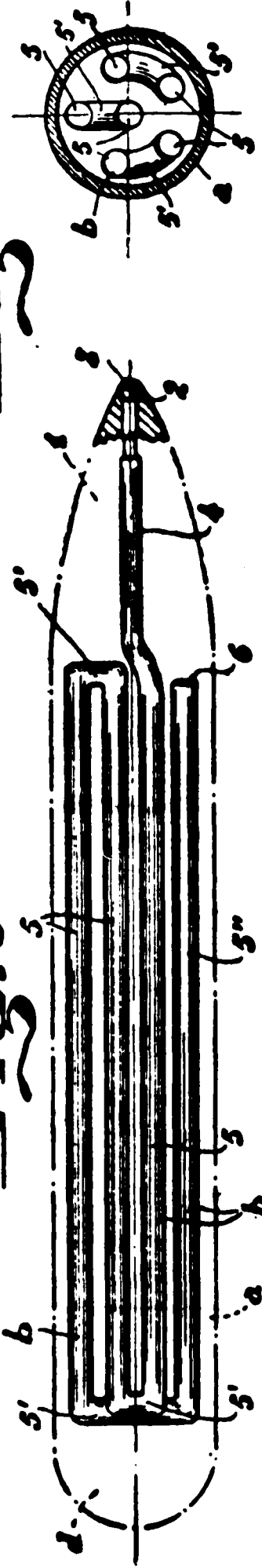


Fig. 6



EXHIBITS.

Exhibit " D "—Amended Original Drawings.

Exhibits.

D.
Amended
Original
Drawings,
10th
October
1944.

K.D
Martin & Scribner
1848

Fig. 1

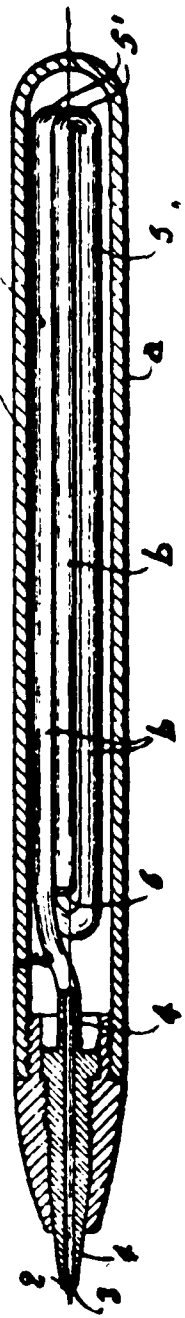
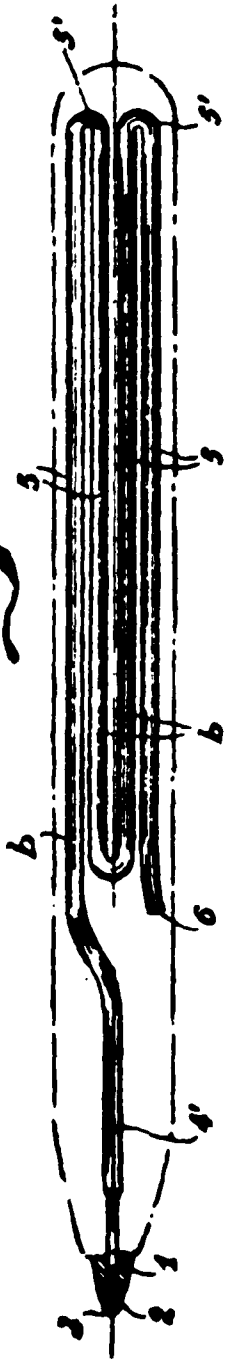


Fig. 2



HENRY GEORGE MARTIN
by -

No 12493
DATED 3-12-48

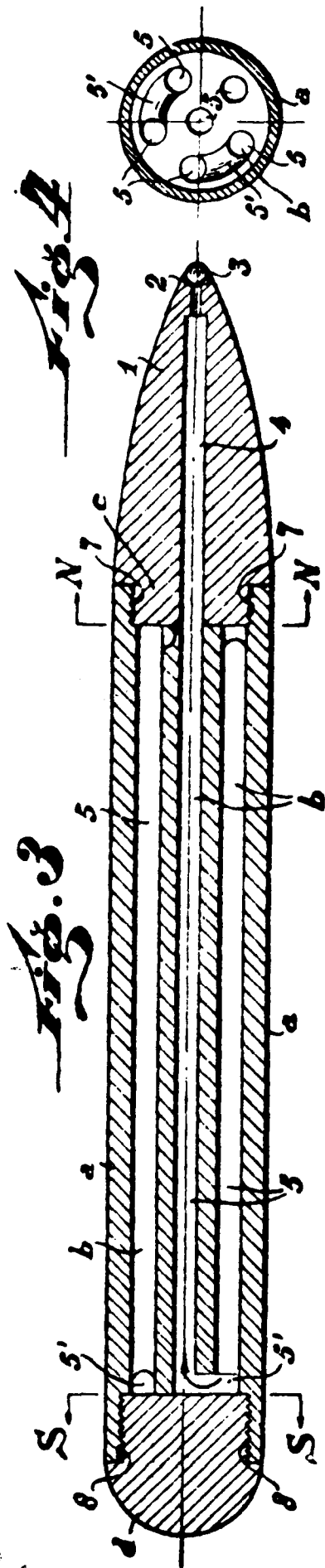


Fig. 3

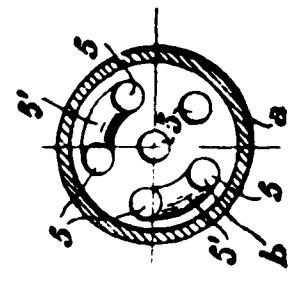


Fig. 4



Fig. 5

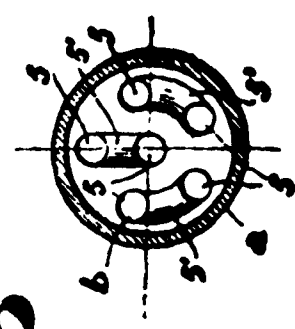


Fig. 6

HENRY GEORGE MARTIN

FIG. 8

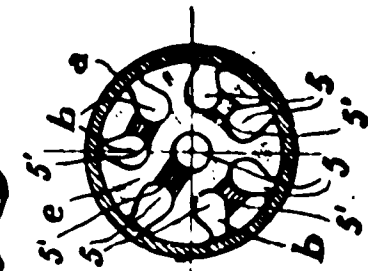
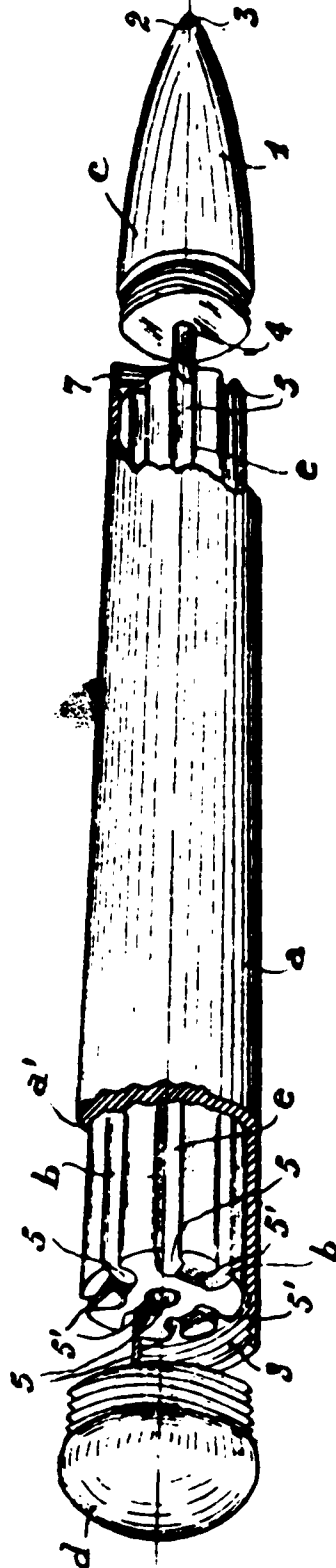


FIG. 7



HENRY GEORGE MARTIN
by -

EXHIBITS.

Exhibits.

Exhibit " G "—Alger's Report and Drawing Relating to Exhibit " E "

C. R. ALGER & SON

25, 27, 29 Market Lane,
Melbourne.

4th September, 1950.

G.
Alger's
Report and
Drawing
relating to
Exhibit E,
4th
September
1950.Messrs. Phillips Ormonde
LePlastrier & Kelson,
37 Queen Street,
Melbourne.

10

REPORT ON DISSECTION OF SCRIBAL PEN.

Reference is made to the drawing attached and marked Appendix B.

The reservoir is a straight length of brass tube, 3.5 ins. (89 mm.) long by 0.106 ins. (2.695 mm.) bore by 0.155 ins. (4.047 mm.) outside diam. It is open at one end. The other end is tightly pressed (to the extent of 0.0004 ins.) over a turned and recessed portion of the ball assembly, hereinafter referred to as the nib.

This nib is of brass, and the external measurements are as shown on the drawing. Communicating with the reservoir is a Capillary of 0.066 ins. Diam. (1.69 mm.) bore extending in to the nob 0.238 ins. (6 mm.). This then closes down to a Capillary of 0.059 ins. diam. (1.52 mm.) for a length of 0.302 ins. (7.7 mm.) to a cored portion which leads into a final Capillary of 0.0215 ins. bore (0.547 mm.) for a length of 0.084 ins. (2.156 mm.) to where it is coned outwards to a diam. of 0.040 (1.02 mm.) into which the ball fits, and is retained by light spinning over of the brass at the tip of the nib.

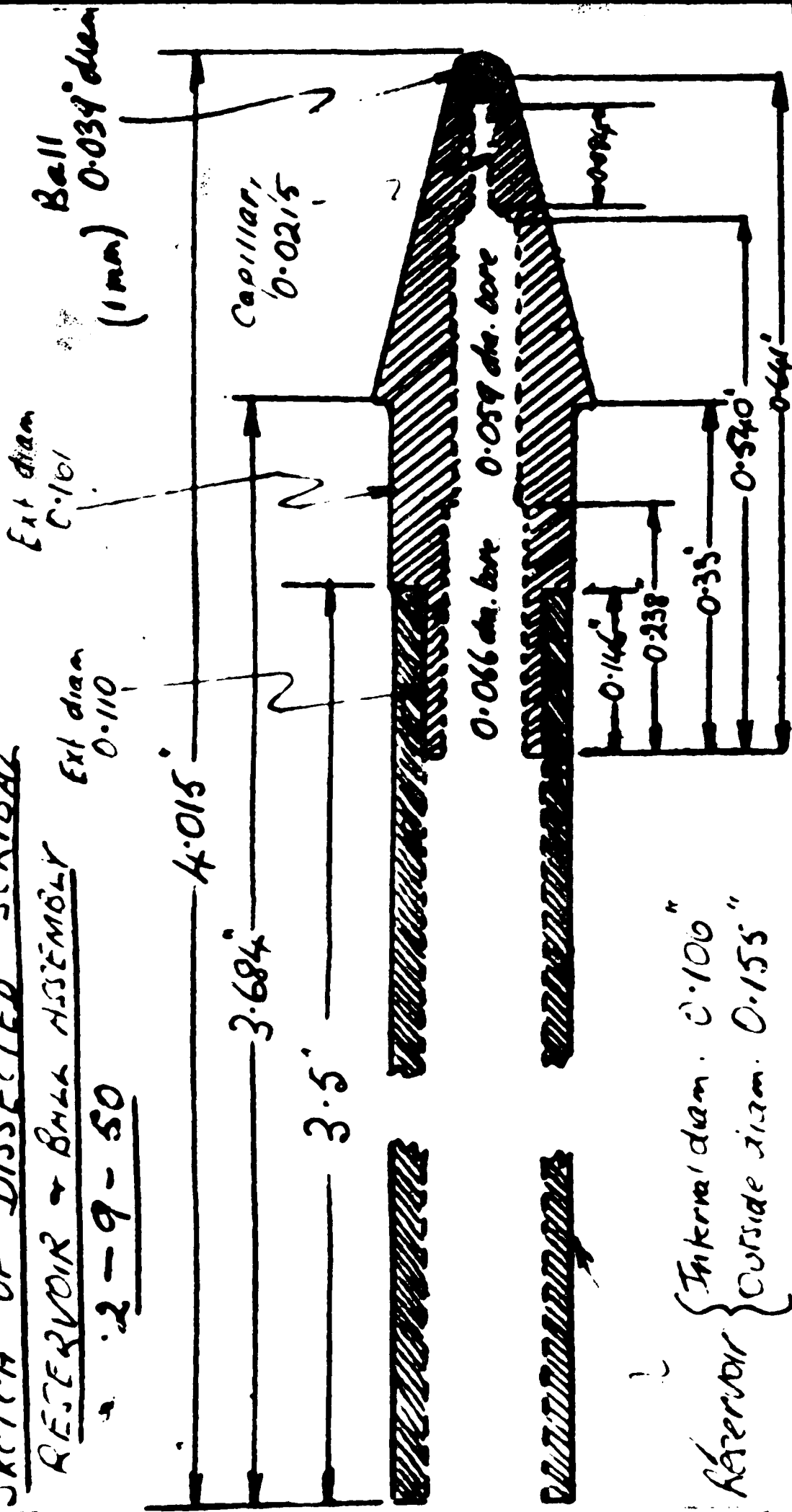
(Sgd.) C. R. ALGER.

C. ALGER & SON.

SKETCH OF DISSECTED SCRIBAL

RESERVOIR & BALL ASSEMBLY

2-9-50



EXHIBITS.

Exhibits.

 Exhibit " J "—Alger's Report Relating to Exhibit " H."

C. ALGER & SON,
 Scientific Instrument
 Makers.

25, 27, 29 Market Lane,
 (Off 122 Bourke St.),
 Melbourne.

12th May, 1947.

J.
 Alger's
 Report
 relating to
 Exhibit
 " H,"
 12th May
 1947.

REPORT ON SCRIBAL PEN.

Reference is made to the drawing attached and marked Appendix A.

The reservoir a is a straight capillary tube of .120 inches (3.0479 mm.)
 10 inside diameter with an open end b. It is made of brass and is 3.25 inches
 (82.542 mm.) in length.

At remote end c towards the writing point the reservoir a is affixed
 to a tubular member d, which in turn is affixed within the " nose or nob
 portion " e of the instrument.

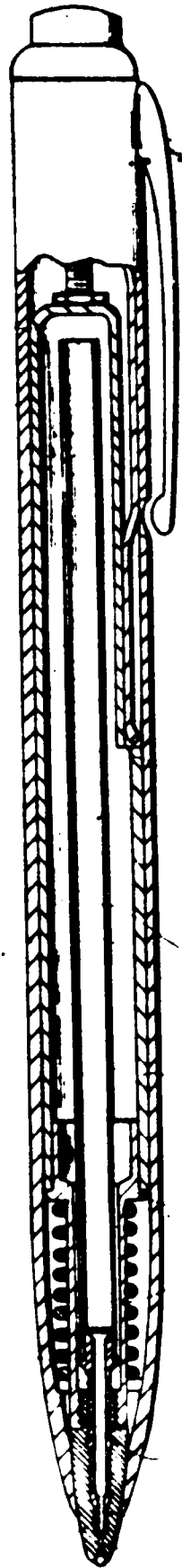
The tubular member d is provided with a capillary f $\frac{17}{32}$ inches
 (13.493 mm.) long and 0.046 inches (1.1682 mm.) diameter, followed by
 capillary g which is $\frac{7}{64}$ inches (2.7779 mm.) long and of diameter varying
 between 0.02 and 0.035 inches (.50795 to .88892 mm.).

The capillary g leads into a further capillary h formed within the nose
 20 or nib section e which capillary h communicates with the socket housing
 the ball j. The capillary h is 0.050 inches (1.270 mm.) in length and
 0.018 inches (.45716 mm.) diameter.

The ball j is 0.039 inches (.9905 mm.) diameter.

The nose or nib portion e screws into a tubular connecting piece k,
 to the remote end of which a barrel portion l is affixed. The barrel
 portion l is recessed to accommodate a clip influenced spring, and has an
 orifice m communicating with atmosphere.

(Sgd.) C. H. ALGER.



b

m

a

l

h

f

j

h

g

c

d

e

EXHIBITS.

Exhibit " L.1."—U.S.A. Specification No. 2,258,841.

Exhibits.

L.1.
U.S.A.
Specifica-
tion No.
2,258,841,
14th
October
1941.

271

Ed. L. 1).
Martin & Co.
in Buffalo

Oct. 14, 1941.

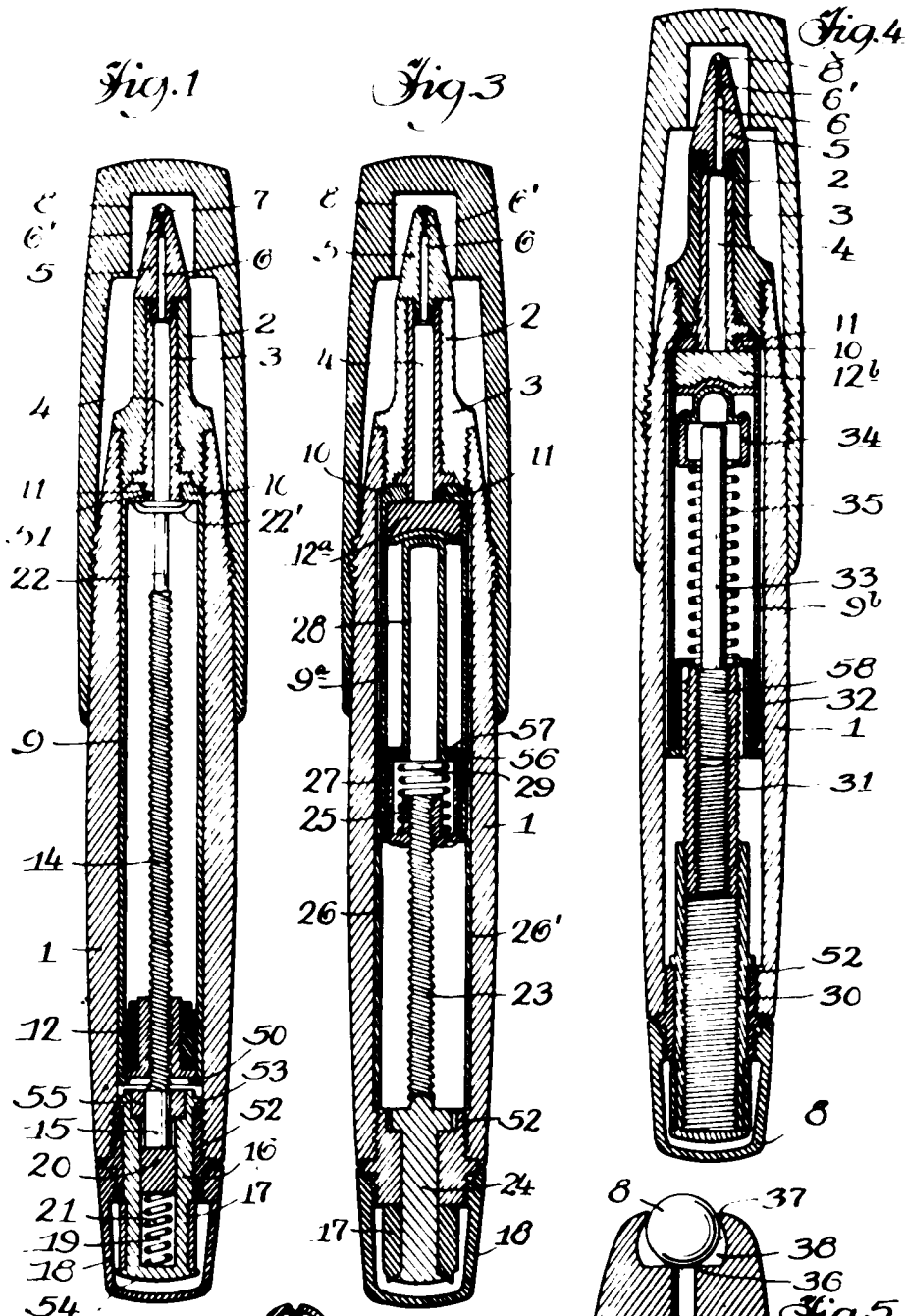
L. J. BIRO

2,258,841

FOUNTAIN PEN

Filed April 23, 1941

2 Sheets—Sheet 1



Witness:
Chas. X. Hensch.

INVENTOR:
Laszlo Jozsef Biro.
BY *Parkinson & Lane*
Atty.

Oct. 14, 1941.

L. J. BIRO

2,258,841

FOUNTAIN PEN

Filed April 23, 1941

2 Sheets-Sheet 2

Fig. 6.

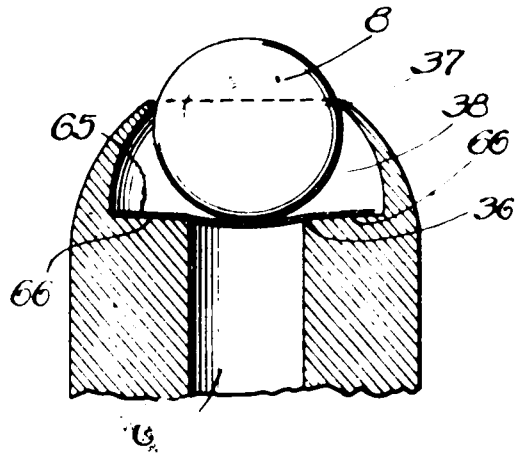
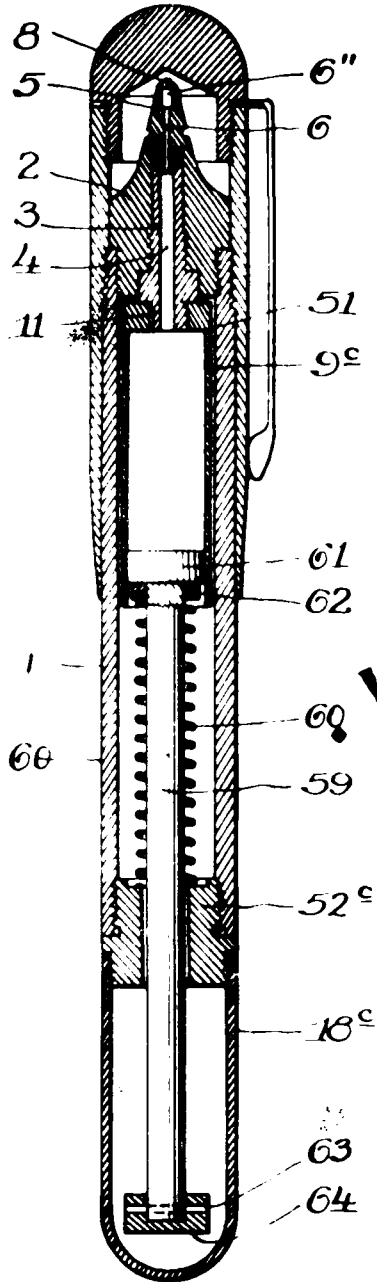


Fig. 7.

Witness:
Chas. L. Kirsch

INVENTOR
Jaszi Jozsef Biro.
BY *Parkinson & Lane*
Attys.

UNITED STATES PATENT OFFICE

2,258,841

FOUNTAIN PEN

Laslo Josef Biro, Buenos Aires, Argentina, assignor to Luis Lang, Buenos Aires, Argentina

Application April 23, 1941, Serial No. 389,830

19 Claims. (Cl. 138-43)

This invention relates to fountain pens, and more particularly to fountain pens of the type for use with a writing material of a pasty consistency and having a replaceable cartridge or container for the ink paste, which may be removed when the ink is exhausted and a full cartridge or container be inserted into the fountain pen hollow barrel.

Preferably my new fountain pen has a ball point, which ball is rotatably mounted in the forward end of the tip, means being provided for feeding the ink to the ball and from the ball to the paper in such manner as to result in great efficiency, and enable continuous and satisfactory use of the pen. I have provided a ball point fountain pen such as to prevent too rapid drying of the ink and at the same time obviate too much looseness of the ball in its inclosure.

Fountain pens using pasty writing material and having a ball point, as known prior to my invention, have necessitated the use of means for bringing a relatively large area of the ball into constant contact with the writing material and a relatively large clearance for the ball, since the heretofore available writing pastes dried too rapidly and caused clogging of the writing point.

In order to ensure prompt absorption of the contained moisture of the writing paste, when writing therewith, it is highly desirable that the paste be applied to the paper in a very thin coat. I have provided a new writing paste as described and claimed in my copending application Serial No. 389,829, filed April 23, 1941, which is especially adaptable in my present novel fountain pen. The new features of my present fountain pen, together with my new writing paste just referred to, provide a new combination of results never attainable prior to my invention.

Among the objects of my invention is to obviate the disadvantages and to accomplish the advantages referred to above.

A further object is to provide a ball-pointed fountain pen of the general type indicated above and described hereinafter, which shall be particularly adapted to be used in conjunction with pasty writing material having a relatively high humidity content.

A still further object of my invention is to provide a fountain pen of the type described, which shall expend only a very thin coat of pasty material to the paper or other writing surface when used with writing pastes of high humidity content and high viscosity.

Another object is to provide a fountain pen in

which the writing ball shall be supported only along two contact circles whereby the gap between the ball and its supporting contact circles is reduced to a minimum and results in the production of only a thin coating of writing paste during the writing operation.

A further object is to provide a fountain pen in which means are provided for the insertion and removal of a paste reservoir or cartridge separately obtainable and designed to be readily inserted into the fountain pen hollow barrel when the previous one has become exhausted and has been removed from the barrel.

A still further object is to provide novel means for expelling under proper pressure the writing paste from the cartridge or container to the ball point in order to give maximum efficiency and the best results in the writing operation.

Another object is to provide a leaf spring in the ball enclosure for urging the ball with proper pressure into contact with the curled forward edge of the ball enclosing walls or cup.

A still further object is to provide means for the quick and easy removal and replacement of the ink cartridge or container.

Other objects, advantages and capabilities inherently possessed by my invention will later more fully appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein preferred embodiments I wish it understood that the same are susceptible of modification and change without departing from the spirit of my invention.

This application is a continuation-in-part of my application Serial No. 247,969, filed December 27, 1938.

In the drawings:

Fig. 1 is a longitudinal section taken on a median plane of one form of my invention.

Fig. 2 is a transverse section of the cartridge or container for the writing paste.

Fig. 3 is a view similar to Fig. 1 but showing a modification of my invention.

Fig. 4 is a view similar to Fig. 1 but showing a still further modification of my invention.

Fig. 5 is a fragmentary longitudinal section taken on a median plane through the writing ball and its seating or support.

Fig. 6 is a view similar to Fig. 1 but showing another form of my invention, and

Fig. 7 is a view similar to Fig. 5 but showing a different form of support for the writing ball.

Referring first to the form of my invention shown in Fig. 1, my novel fountain pen comprises a hollow barrel 1, one end of which has screwed into it a feeder in the form of a hollow body portion 2 containing a tube 3 tightly fitting therein and having a longitudinal central bore 4. The end of the feeder remote from the barrel 1 has screwed into it a writing head 5, the free end of which carries the rotatable writing ball 6 supported to rotate about any axis in an enlarged cavity 38 (Fig. 5), which in the assembled pen is in communication, except for such interruption as occurs from the presence of the ball, with the bore 4 of tube 3 by a relatively narrow passage 6 extending longitudinally centrally of the writing head and terminating just below the cavity 38 in a still narrower longitudinal bore 6'. The free edges of the wall or walls defining the enlarged cavity 38 are spun or crimped over to provide an annular retaining and contact edge 37, between which and the circular opening 36 of the outlet 6' the ball 6 is rotatably held so that said ball is in contact with its support only along the two circles defined by said spun-over wall and said opening 36 as seen in Fig. 5.

In the embodiment shown in Fig. 7, I have provided more or less narrow leaf spring 65 of less width than the diameter of the opening 36, so that said leaf spring extends across said opening and extends at both ends over the two shoulders 66, which shoulders in effect form the inner end of the cavity 38. By this construction the ball is constantly spring-urged into contact with the upper circular seating edge 37. This spring 65 provides an intimate contact between the ball and the seating edge 37 while the pen is at rest, but permits the ball to move slightly away from the said seating edge during the act of writing to allow passage of the proper amount of paste on the ball surface as the ball rotates during the writing operation. This construction of the ball support may be adopted in any of the other embodiments shown and described in this specification if desired.

Referring again to Fig. 1, the main portion of the interior of the barrel has removably positioned therein a tubular casing or cartridge 9 which forms a container for the writing paste, said casing being preferably made of metal so that it will readily withstand handling and transportation and also prevent evaporation of the moisture content of the ink paste. The rear end of the casing 9 is spun or crimped over to form a shoulder or stop 50 against which a piston 12 contacts when in its lowermost position in the container 9. Piston 12 is located within the casing 9 and has a longitudinally threaded opening adapted to be threaded onto corresponding threads on screw 14 disposed longitudinally within said casing. To prevent rotation of the piston 12 with relation to the container 9 upon rotation of the screw 14, grooves (not shown) are provided at diametrically opposite points therein adapted to engage ribs 13, 13' (Fig. 2) formed longitudinally on the inside of said container 9.

The forward end of the casing 9 is partially closed by an end wall 10 having an internally threaded opening 51 formed therein adapted to have screwed thereinto an externally threaded connecting member 11 former upon the rear end of tube 3. When the ink container is not in use in the fountain pen, the opening 51 is adapted to receive a threaded stopper (not shown), cork

or other closure means for closing the container or cartridge while being stored.

The forward end 22 of the screw 14 is supported by a resilient bridge member 22' which, as shown, throughout the greater part of its length is spaced away from the inner end of bore 4 in order to keep the rear end of opening 51 (when the container is not in use in the pen), and the rear end of bore 4 of tube 3 (when assembled to the casing) clear so as to ensure free passage through bore 4 for the writing paste. As stated, the bridge member 22 is made of resilient material to permit it to move forwardly under pressure of rod 14, 22, and to return to its original shape when the pressure of said rod thereagainst is relieved.

Screw 14 at its rear end projects beyond the cartridge or container 9 and is formed of square or other non-circular cross-section at 15, or splined to enable it to be coupled in driven engagement with a driving member 16 rotatably mounted in a bearing 52 threaded into the rear end of the barrel 1 and projecting therebeyond to receive a screw cap or end closure 18. This construction enables the end portion 15 of screw 14 to have longitudinal movement when desired but at the same time rotate with the driving member 16. Near the forward end of the driving member 16 is provided an annular flange 53 which abuts against the corresponding end of the bearing 52 to prevent withdrawal of the driving member rearwardly of the pen. Said driving member 16 projects rearwardly beyond the bearing 52, and has secured to it in a circumferential groove a knurled or roughened sleeve 17 adapted to serve as a gripping and driving surface. The sleeve 17 abuts against the rear end of the bearing 52 and prevents forward movement of the driving member 16 while permitting rotation thereof. The rear extremity 54 of driving member 16 is spun over to retain the sleeve 17 in position.

The driving member 16 is formed with an interior bore 19 to receive a plunger 20 which is urged toward the forward end of the member 16 by having coil spring 21 located in bore 19, the forward end of said bore being partially closed by an annular ring 55 which acts as a stop to limit the forward movement of the plunger 20 inside the bore, and also to act as a coupling member to receive the squared or non-circular cross-section end 15 of the screw 14.

The function of the spring 21 is to exert pressure on the writing paste, said pressure being transmitted thereto through the screw 14 and piston 12 against the yielding reaction of the bridge member 22'. The positioning rearwardly of the screw 14 of the spring pressing means 21 enables the use of a short spring with a consequent saving of space, which is utilized to increase the capacity of the paste cartridge or container 9.

The thread on the screw 14 terminates some distance rearwardly of its forward end to provide for disengagement of the piston 12 from said screw 14 when the piston reaches the unthreaded portion of screw 14, as it does approximately at the time when the supply of paste in the container 9 is exhausted. By this arrangement the user of the pen is enabled to tell when the paste in the container 9 is empty and the piston 12 consequently at its forward end of travel, as it will then be disengaged from screw threads 14, and continued rotation of the driving member 16 will give no sensation of pressure as

it would when the piston is forcing paste out of the container.

With the parts in the position shown in Fig. 1, with the container 8 full of paste, the spring 21 exerts pressure on the paste as explained above to force the paste along the bore 4 of the feeder member into the passage 6 and along the constricted bore 6' into the enlarged hollow or ball cavity 28.

Very little paste penetrates into the ball chamber or cavity 28 until the ball has been rotated in the act of writing, and the double circular contact of the ball with its two supports is sufficient combined with the selected strength of spring 21 to prevent the paste from being forced too rapidly past the ball. It is to be understood that in the illustrated position of parts in Fig. 1, the spring 21 is at least partially compressed causing yielding of the resilient bridge member 22'. As the paste is used spring 21 distends maintaining pressure until a quantity of paste has been used such as to relieve the compressive action of spring 21 on the bridge member 22' owing to completion of the distention of the spring 21. Under these conditions the supply of paste to the ball 8 will diminish, thus indicating that the parts must be adjusted. Adjustment is effected by rotation of the driving member 16 to cause forward movement of the piston 12, thereby restoring the pressure conditions referred to. When the contents of container or cartridge 8 have been exhausted and the piston 12 has been disengaged from screw 14 at the forward end of said screw, the empty container 8 may be removed from the barrel 1 and a fresh full container inserted by unscrewing feed member 2 from the barrel and withdrawing it together with the container 8 to which it is removably secured. Upon removal of the empty container 8 and the feeder member 2 the latter may be then unscrewed from the container, or vice versa, and a full fresh container screwed onto the externally threaded connecting member 11, it being understood that the sealing plug will have first been removed from the opening 81 of the container. The new container is then inserted into the barrel and the feeder member screwed thereinto to lock the container in position. Should it happen that during the unscrewing of the feeder member from the barrel it becomes unscrewed from the empty container, the latter may readily be shaken or otherwise pulled out of the hollow barrel.

The embodiment shown in Fig. 1 involves discarding the screw 14 and piston 12 together with the empty casing 8, as the operator of the fountain pen would not be readily able to insert the screw 14 into a new full container. This is, of course, undesirable as it tends to increase the cost of the refills. This difficulty, however, can be readily overcome while still keeping within the scope of the present invention by adopting the modified construction shown in Fig. 3 in which the feeding screw 23 is integral with a solid driving member 24 and has threaded onto it a nut 25 adapted to be guided for longitudinal but non-rotative movement with relation to the barrel by means of the ribs 26 and 26' fixed at suitably spaced intervals and adapted to be longitudinally slidably received in corresponding notches in the nut 25. Said screw 23 is connected by means of a coupling member 27 to a hollow stem 28, the rearward end of which lies within said coupling member 27 and has a flange 28 where by it is loosely secured thereto, said flange 28 being urged

into contact with an inturned rib 27 of the coupling member 27 by a coil spring 29 located within the coupling member and positioned around the nut 25 against one end of which one end of the spring 29 compressively contacts.

The piston 12' of the form shown in Fig. 3 is part of the casing assembly and is adapted to be propelled forwardly of the pen by said hollow stem 28, which is itself caused to advance by rotation of the driving member 24 which causes the nut 25 and its associated parts, including the stem 28, to travel along the screw 23. In the drawings, the parts of the embodiment of Fig. 3 are shown when the piston has reached the forward end of its travel, that is to say, when the charge of ink paste in the container 8 has become exhausted and it is necessary to insert a refill. It will be noticed that all that is discarded with the container 8' is the piston 12', which can be made of comparatively cheap material.

The form shown in Fig. 4 is a modification of that shown in Fig. 3 and is intended to permit the use of a longer container than Fig. 3, it being observed that to save the feeding screw of Fig. 1 the casing in Fig. 3 had to be reduced considerably in length, thus reducing the useful life of a charge.

In the form shown in Fig. 4, instead of the solid driving member 24 of Fig. 3, a hollow internally threaded elongated driving sleeve 30 is provided which is in threaded engagement with an internally and externally threaded sleeve 31 rigidly connected to a cup-like member 32 guided to move longitudinally of the barrel 1. The sleeve 31 has screwed into it a threaded portion 33 of a stem 34, the forward end of which has mounted on it for free rotational movement a pusher head 34 adapted to engage the rear end of the piston 12', which piston forms part of the container assembly as in Fig. 3. Between the pusher head 34 and the cup-like member 32 is interposed a coil spring 35 to provide for compression of the writing paste to force the same through bore 4 as in the preceding embodiments.

When the casing 8' is full and has been assembled in the barrel of the pen, the whole of sleeve 31 must lie within the threaded bore of the driving sleeve 30. When in this position with the stem 34 fully screwed into the sleeve 31, the cup-like member 32 will enclose the forward end of the driving member 30 and thus permit of a longer casing or container 8' within the barrel 1 than the casing 8' of Fig. 3.

Fig. 6 shows a simplified form of construction of my invention in which the feeding screw has been omitted, and which simplified form of Fig. 6 has the advantage that the writing paste is continuously under feeding pressure so that no screwing forward of the piston advancing parts by hand is required. In this example, the piston 61 of the casing or container 6' is a relatively thick disc of paraffin-wax-impregnated leather, the cost of which is negligible, so that the discarding of the piston together with the empty container is a matter of no practical consequence. The piston 61 is continuously under the pressure of the feeding spring 60, one end of which is in contact with the forward end of a bearing and coupling member 62' which connects the rear end cap 60' to the barrel 1.

The other end of spring 60 contacts the rear face of an annular ring 62 fixed on the end of a plunger rod 63, which slidably and rotatably passes through an opening in the bearing and

coupling member 82, and the rearward end of which has secured to it, as by a cotter or pin 83, a knob 84 to facilitate retraction of the rod 80 and ring 82 when inserting a refill in the barrel. Access to the knob or handle 84 is gained by unscrewing the end cap 18. In this modification it has been found advisable to substitute an outlet 8' of somewhat larger diameter than the passage 8 for the constricted opening 8' of the other embodiments, owing to the fact that as the piston 81 approaches the forward end of the casing or container 8* by reason of the using up of the paste the thrust of the spring 88 weakens and the presence of the larger outlet 8' assists in maintaining the flow.

It will be noted that in all of the embodiments of my invention and particularly those of Figs. 3, 4 and 6, the piston is left inside the casing when the latter is discarded upon becoming empty. As previously stated, the cost of the piston is negligible but apart from this it is distinctly advantageous to have the piston associated with the casing or refill rather than separable therefrom, as otherwise a user in fitting the piston to a new casing might cause air to be entrapped between the piston and the paste, which entrapped air under the pressure of the feeding devices and because of the pasty nature of the writing material would permeate the paste and form small bubbles therein, giving rise to interruptions in the flow. Furthermore, the supplying to the user of a refill in the form of a clean metal casing, with the piston properly positioned and assembled by the manufacturer, not only ensures the user against the above mentioned trouble but enables him to recharge the pen without any messy handling of a used piston and without risk of accidentally ejecting paste on the piston end of the casing.

It will be obvious to those skilled in the art that there are various modifications in the construction of my novel pen, and although I have hereinabove described certain preferred embodiments, I wish it understood that the same are susceptible of modification and change without departing from the spirit of my invention.

Having now described my invention, I claim:

1. In a fountain pen of the type adapted to be charged with writing material of a pasty consistency, a hollow barrel, a closure removably supported on said barrel at the forward end thereof, said closure having a bore extending longitudinally therethrough and communicating with the interior of the barrel, the forward portion of said closure having a transversely extending supporting face on all sides of the forward end of said bore, said closure having a hollow nose portion extending forwardly from said supporting face, a ball on said supporting face in line with said bore, the forward edge of the hollow nose portion being curled over to provide a circular edge of smaller diameter than the ball, the said parts being so constructed and arranged that the ball is rotatably held between said curled edge and supporting face to permit a thin film of ink to be carried by the ball from within to outside the curled edge for writing purposes, said nose portion being formed with an ink receiving cavity laterally around the ball from the supporting face to the curled edge, a removable container for pasty ink in said barrel, a piston in the container, and a piston rod for said piston and removable from the container while the container is being removed from the barrel.

2. A fountain pen according to claim 1, in

which is provided a spring continuously pressing against the piston for continuously supplying writing paste to the ball.

3. In a fountain pen of the type adapted to be charged with writing paste, a hollow barrel, a closure removably supported on said barrel at the forward end thereof, said closure having a bore extending longitudinally therethrough, the forward portion of said closure having an enlarged cavity, the side walls forming the cavity having an open forward end and inwardly bent forward edges, said bore extending from the interior of the barrel to the cavity, a spring strip extending across the floor of the cavity and across the end of the bore, the length of the strip being greater than the diameter of the bore and the width of the strip being substantially less than said bore diameter, and a ball rotatably mounted between said strip and said inwardly bent edges of the cavity.

4. A fountain pen according to claim 3 in which the diameter of the ball is such that the ball will be normally urged by the strip against said bent edges.

5. In a fountain pen of the type adapted to be charged with writing paste, a hollow barrel, a feeder element detachably secured to the forward end of the barrel, said feeder element having a longitudinal bore therethrough, a ball rotatably mounted in the tip of the feeder element and seated in a cavity, said bore being in communication with the interior of the barrel and the cavity, a container adapted to contain writing paste and removably mounted in the barrel, a piston in the container in contact with the rear end of the writing paste, a piston rod in loose and removable contact with the rear face of the piston, a shoulder in the rear end of the barrel, a coil spring surrounding the piston rod and held in compression between said shoulder and the piston, the piston remaining in the container when the container is removed from the barrel, and the piston rod and coil spring remaining in the barrel upon removal of the container.

6. A fountain pen according to claim 5, in which the container is removably attached to the feeder element and removable therewith from the barrel.

7. A fountain pen of the type adapted to be charged with a writing material of a pasty consistency, comprising a hollow barrel having a forward end and a rear end, an internal screw thread in each of said ends, a feeder adapted to be screwed into said forward end and having a duct coaxial with said barrel and an externally threaded connecting member projecting rearwardly of said feeder, a writing ball support secured to the forward end of the feeder the end of said support remote from the feeder being free and having formed therein an enlarged hollow having a bottom and a surrounding side wall, a circular opening in said bottom, a passage in said support coaxial with said duct and said barrel, and establishing communication between said duct and said enlarged hollow through said circular opening, a ball adapted to convey writing paste to the surface to be written on, said ball being located in said enlarged hollow and said side wall being inturned to provide a circular contact edge contacting the forward side of said ball, a separable paste containing casing located within said barrel and having a forward end with a threaded perforation adapted to have screwed thereinto said connecting member, said casing having a rear end with an inwardly ex-

tending lip, a resilient bridging member located within the forward end of the casing, a rod extending from said bridging member lengthwise through said casing and having a rear end projecting beyond the rear end of the casing, said rear end of said rod being non-circular in cross-section, a screw thread cut on said rod and extending from said non-circular rear end to a point short of the bridging member, a piston mounted in screwed engagement on the threaded portion of the rod and located at the rear end of said casing in abutment against said lip, guiding means provided lengthwise internally of said casing for guiding said piston and preventing rotation thereof, a bearing secured in the rear end of the barrel, a driving member rotatably mounted in said bearing, said driving member having a non-circular opening therein adapted to receive the non-circular end of said rod to establish driving connection therewith, a blind bore extending lengthwise of said driving member and of greater diameter than said non-circular opening, a plunger within said blind bore and displaceable lengthwise thereof and a spring located in said blind bore between the blind end thereof and the plunger, whereby in the assembled condition of the parts the paste contained in the casing is subjected to pressure to urge it towards said ball and said plunger may be manually moved forward by rotation of said driving means to take up room left by the using up of said paste and upon exhaustion of the charge in said casing said piston becomes disengaged from the thread on the rod to indicate the necessity for renewal of the charge.

8. A fountain pen according to claim 7 in which said ball is seated on said circular opening whereby it is held between only two contact edges.

9. A fountain pen according to claim 7 in which a leaf spring is provided in said enlarged hollow, said leaf spring extending across said circular opening and being of width less than the diameter thereof and arranged to urge said ball against said circular contact edge.

10. A fountain pen of the type adapted to be charged with writing material of a pasty consistency, comprising a hollow barrel having a forward end and a rearward end, an internal screw thread in each of said ends, a feeder adapted to be screwed into said forward end and having a duct coaxial with said barrel and an externally threaded connection member projecting rearwardly of said feeder, a support secured to the forward end of the feeder, the end of the support remote from the feeder being free and having formed therein an enlarged hollow having a bottom and a surrounding side wall, a circular opening in said bottom, a passage in said support coaxial with said opening, said duct and the barrel and establishing communication between said duct and said enlarged hollow, a ball adapted to convey writing paste to the surface to be written on, said ball being located in said enlarged hollow and said side wall being inturned to provide a circular contacting edge in contact with the part of the ball remote from the barrel, a separable paste containing casing located within said barrel and having a forward end with a threaded perforation adapted to have screwed thereto said connecting member, said casing having a rear end with an inturned lip, a piston located within said casing against said lip and displaceable lengthwise of said casing, and driving means for said piston including a bearing mounted within the rear end of the barrel, a

screwed stem having an integral non-threaded rear end rotatably journaled in said bearing, a nut threaded on the screwed portion of said stem, a hollow cup-like member secured to said nut and having a perforation adapted to allow the stem to pass therethrough as the nut is caused to travel therealong, a hollow push member extending through said perforation and adapted to permit said stem to extend thereto, said hollow push member having an outwardly flanged rear end whereby it is loosely connected to said cup-like member and a spring within said cup-like member seated between said nut and said outward flange, said hollow push member being adapted to engage the rear face of the piston in the assembled condition of the parts and to transmit thereto the pressure of the spring and the forward movement of said nut on rotation of the non-threaded portion of the stem, thereby to force the paste charge of the casing towards the ball, and whereby on exhaustion of the charge said casing may be removed from said barrel independently of the stem and driving means and a fresh casing and piston inserted to recharge the pen.

11. A fountain pen according to claim 10, in which said ball is seated on said circular opening while in contact with said circular edge, whereby it is held between only two circular contact edges.

12. A fountain pen according to claim 10, in which a leaf spring is located in said enlarged hollow across said circular opening, said spring being of width less than the diameter of the circular opening and having said ball in contact therewith whereby said ball is spring urged towards said circular contact edge.

13. A fountain pen of the type adapted to be charged with a pastry writing material, comprising a hollow barrel having an internally threaded forward end and a rearward end, feeder means adapted to be screwed into said forward end and having a duct coaxial with the barrel and an externally threaded connection member projecting rearwardly of said feeder, a support secured to the forward end of the feeder, the end of the support remote from the feeder being free and having formed therein an enlarged hollow having a bottom and a side wall, a circular opening in said bottom, a passage in said support coaxial with said duct and said opening and establishing communication between said duct and said enlarged hollow, a ball adapted to convey pasty writing material to the surface to be written on, said ball being located in said enlarged hollow, and said side wall being inturned to provide a circular contacting edge in contact with the ball on the side thereof remote from the barrel, a separable paste containing casing located within said barrel and having a forward end with a threaded perforation adapted to have screwed thereto said connection member, said casing having a rear end with an inturned lip, a piston in said casing in abutment against said lip when the casing is full of paste and adapted to be displaced lengthwise of the casing, to force out paste through said perforation, said duct, said passage and said opening into said enlarged hollow and into expending contact with said ball, driving means mounted in said barrel and independent of said casing for driving said piston forward, said driving means comprising a bearing in the rear end of the barrel, a hollow internally threaded tubular member rotatably

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mounted in said bearing and projecting forwardly and rearwardly therebeyond, an internally and externally threaded hollow sleeve in screwed engagement with said tubular member, a push member having a threaded rear portion screwed into said sleeve and a forward portion having secured thereto a head adapted to engage said piston in the assembled condition of the pen, a cup-like member rigidly mounted on the forward end of the sleeve, said cup-like member having its opening directed rearwardly to embrace the forward projection of the tubular member on retraction of said threaded sleeve, and a spring extending between said cup-like member and said head whereby pressure is transmitted to the paste and upon exhaustion of the charge in the casing the casing may be removed for replacement independently of the driving means.

14. A fountain pen according to claim 13, in which said ball is seated on said circular opening while in contact with said circular contacting edge, whereby it is held between only two circular edges.

15. A fountain pen according to claim 13, in which a leaf spring is provided in said circular hollow, said leaf spring extending across said circular opening and being of width less than the diameter thereof, and said ball being in contact with said spring whereby it is resiliently urged into intimate contact with said circular contacting edge.

16. A fountain pen of the type adapted to be charged with a pasty writing material, comprising a hollow barrel having an internally threaded forward end and a rear end, feeder means adapted to be screwed into said forward end and having a duct coaxial with the barrel, and an externally threaded connection member projecting rearwardly from said feeder, a support secured to the forward end of the feeder the end of the support remote from the feeder being free and having formed therein an enlarged hollow having a bottom and a surrounding side wall, a circular opening in said bottom, a passage in said support coaxial with said barrel and said opening, and establishing communication between said duct and said enlarged hollow, a ball adapted to convey pasty writing material to the surface to be written on, said ball being located in said enlarged hollow, said side wall being intumed to provide a circular contact edge contacting said ball on the side thereof remote from said opening, a separable

paste containing casing located in said barrel and having a forward end with a threaded perforation therein adapted to have screwed thereinto said connection member, and a rear end with an intumed lip, a piston located in said casing in abutment against said lip when said casing is full of paste and adapted to be displaced lengthwise of said casing to force paste through said perforation, said duct, said passage and said opening into expending contact with said ball, driving means mounted in said barrel for driving the piston forward, said driving means comprising a bearing mounted in the rear end of the barrel, a rod extending through said bearing in slidable and rotatable relation therewith, said rod having a head on its forward end adapted to engage said piston and a knob on its rearward end adapted to facilitate retraction of said rod, and a spring extending between the forward end of said bearing and said head and adapted to urge said head forward whereby to apply a continuous expending pressure to the paste within the casing while permitting ready removal of the casing and the piston upon exhaustion of the charge independently of said driving means.

17. A fountain pen according to claim 16, in which said ball is seated on said circular opening while in contact with said circular contacting edge, whereby it is held between only two circular edges.

18. A fountain pen according to claim 16, in which a leaf spring is provided in said enlarged hollow, said leaf spring extending across said circular opening and being of width less than the diameter of said opening, said ball being in contact with said spring whereby it is normally urged into intimate contact with said circular contacting edge.

19. In a fountain pen of the type adapted for use with writing paste, a hollow barrel, a closure removably supported on said barrel at the forward end thereof, said closure having rotatably mounted in its forward end a ball, a container mounted in said hollow barrel and adapted to contain writing paste, means for feeding writing paste from the container to the ball, and means for removably mounting the container in the barrel so that when the writing ink in the container is exhausted the container may be removed from the barrel and a fresh container inserted thereinto.

LASZLO JOZSEF BIRO.

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Patented Dec. 2, 1941

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UNITED STATES PATENT OFFICE

2,265,055

FOUNTAIN PEN FOR PULPY INK

László János Biró, Budapest, Hungary, assignor
to Luis Lang, Buenos Aires, ArgentinaApplication December 27, 1938, Serial No. 247,969
In Hungary November 23, 1938

2 Claims. (Cl. 128—43)

The present invention relates to a fountain pen, which is provided instead of the usual writing pen with a rotatably mounted small ball, which constitutes the writing means. It is well known to fill fountain pens of this kind with a dense, pulpy ink in order that the fountain pen may be used after filling it once during an essentially longer time than when using liquid ink.

However, the known fountain pens of such construction have worked very unsatisfactorily, as the pulpy ink must be of a quickly drying nature in order to become promptly dry on the writing surface and not to be blurred. However, this property of the pulpy ink entailed that the small quantity of pulpy ink which remained around the writing ball after writing became quickly dry and formed a hard layer, which prevented the rotation of the small ball; but the ball has to continuously turn during writing in order to carry the ink or dye from the interior of the pen to the paper. Or, in order that the pen should be always ready for use, the pulpy ink should remain moist in the open air contrary to its formerly mentioned property.

One object of the invention is to satisfy both contrary requirements. With this object in view the pulpy ink is made of a mixture of two ingredients, one of which is a quickly drying viscous material and the other one a non-drying, preferably even hygroscopic liquid. Both materials should be of such nature that they can be easily separated from each other by physical means. By this it is attained that the quantity of pulpy ink remaining around the ball after writing does not dry, but is maintained moist as it contains a non-drying liquid, while the non-drying ingredient of the ink will be immediately absorbed by the paper during writing and thus is it removed from the pulp and the remaining other ingredient will quickly dry. Every writing surface employed in practice shows a certain absorptive power for moisture which affords the absorption of the small moisture contents of the pulp.

The viscous (pulpy) drying material may be for instance glue or a polysaccharid and the non-drying liquid may be cholesterolised oil or for example glycerine. It is preferable, in general, to use as a non-drying or hygroscopic liquid a fatty material or at least a material having the properties of fats, as such materials lubricate the writing ball, moreover, it has been found that they satisfy also other practical requirements. The pulp is made for example in such a manner that a powdery aniline color is dissolved in about

the same quantity of glycerine and to the solution 35 to 40 per cent viscous dextrin is added, which is obtained in such a way that to powdery dextrin water is admixed and the mixture is heated. Also other materials may be added to this mixture, for example a small quantity of vinegar, which renders the colour more vivid and conserves the pulp. For the latter purpose also carbolic acid may be used. As in the finished pulp the colored liquid forms only a mixture with the dextrin, it may be easily separated from the same by simple physical means. Thus, owing to the absorptive capillary action of the paper the non-drying ingredient penetrates into the same so that it is separated from the dextrinous part.

In order that a pulpy ink of this kind may be readily used, the ball has to apply the pulp in a very thin layer to the paper, as otherwise the latter cannot absorb the whole fluid contents of the pulp and the written text will not dry. The thin layer has the further advantage that the consumption is low and thus one filling may be used for a very long time. Consequently, to this pulp a fountain pen is employed the writing ball of which is in contact with its bearing along two circles only and by this a relatively tight mounting of the ball is attained, so that the same may carry only a very thin layer of the pulp. The ball is easily set in rotation even at the beginning of writing in spite of its tight mounting as it is always surrounded by the moist pulp. Finally, as the pulp of the above composition is very dense it cannot be filled into the fountain pen by its user himself, the less, as if an air bubble is coming into the pulp it hinders the operation of the pen. By this reason, according to the invention, the fountain pen is provided with a container for the pulp, which may be easily interchanged and thus after the consumption of the pulp contents of the pen the empty container is cast off and is substituted by another container filled in the factory.

The annexed drawing illustrates by way of example three embodiments of the fountain pen constructed in accordance with the invention.

Fig. 1 represents an enlarged axial section of the first embodiment.

Fig. 2 is a sectional view of the container of the pulpy ink.

Figs. 3 and 4 are axial sections of two other embodiments equally on an enlarged scale.

Finally, Fig. 5 represents the writing ball and the bearing thereof on a still more enlarged scale and partly in section.

In the embodiment according to Fig. 1 the

outer part of the fountain pen is constituted by a hollow body 1, on one end of which a closing member 2 is fastened by its threads. The latter contains a sleeve 3 and a relatively wide channel 4, in the interior of which the pulpy material is forwarded to a head portion 5 of metal in the centre of which there is a tighter channel 6. At the end of the latter channel, in a substantially ball-shaped depression of the head portion 5 a small ball 8 can freely rotate. The end portion 6' of the channel 6 is sufficiently tight to be able to hold the ball 8. In the hollow body 1 of the fountain pen a tube portion 9 is contained, which is preferably made of metal and constitutes an interchangeable container for the pulpy ink. The threaded hole of the covering part 10 of this container is closed by a stopper before use. When interchanging the container 9, the closing member 2 is screwed off, so that together with this portion also the empty container is pulled away from sleeve 1. Now, the stopper is removed from the covering part 10 of the new container, whereafter it may be screwed onto the extension 11 of sleeve 3 and introduced into the fountain pen together with the closing member 2.

The end of the container 9, which in the drawing is the lower one, is closed by a piston 12, which is longitudinally shiftable in this container along both guiding grooves 13 and 13'. Fig. 2 These grooves may be constituted for example by two longitudinal ribs of the metallic tube 9, which are opposite to one another. The piston 12 is provided with internal threads and it is screwed to a bolt 14, the end of which being without the tube 9 and being provided with ribs, by which it is connected to a rotatable sleeve 15. This sleeve is mounted at the bottom of the fountain pen and has a handle member 17 which is accessible after removing the closing cap 18. In a hole 19 of the sleeve 15 a piston 20 is shiftable, which is pressed by a spring 21 against the end portion 15' of the bolt 14, in order that the contents of the container 9 should be maintained under pressure.

The upper end 22 of the bolt 14 does not extend to the bottom of the container 9, but it bears on the covering part 10 of the container 9 by means of an elastic stop 22' in order not to hinder the action of spring 21. This end of the bolt 14 is not threaded in order that the piston 12, at the end of its stroke, should no longer engage the bolt.

Due to the fact that the spring 21 is arranged behind the bolt 14 it is possible to employ a short spring and a long container which can receive much pulp. If the container 9 is filled with pulpy ink, an axial pressure is exerted on the piston 12 by the bolt 14 so that the pulpy ink is maintained under pressure. After consumption of a certain quantity of the pulpy ink, the spring 21 is extended so that the pressure exerted on the pulpy ink is reduced; this pressure is restored by turning the member 16 and the bolt 14, which causes a pushing forward of the piston 12. As a reaction of this pressure the spring 21 will be compressed. As soon as the whole supply of pulpy ink is consumed the bolt 14 disengages piston 12 and when turning the member 16 no resistance may be felt, from which it may be seen that the container 9 is empty and is to be substituted by another one.

A slight disadvantage of the described embodiment consists in that when the container is empty, the bolt 14 cannot be used either, as it is not possible to screw the same into another full con-

tainier. Consequently, at this embodiment the spare containers are to be sold with a bolt 14. This drawback is not present in the embodiment represented in Fig. 3. The screw 23 is integral with the bolt 24, which is rotatable in the protecting cap 18 of the fountain pen. The bolt 23 moves the nut 25 in axial direction, and the nut is guided by bars 26 and 26' being in the hollow body 1 of the fountain pen. The nut 25 is connected by means of a cap-like member 27 to a hollow bolt 28 which actuates the piston 12 of the container 9 for the pulpy ink, whereby between the nut 25 and the hollow bolt 28 a spiral spring 29 is inserted. Fig. 3 shows the piston 12 at the end of its stroke. If the container 9 is filled with ink and the piston 12 is at the bottom of the container, also the nut 25 is situated at the lower end of the bolt 23 and the latter extends to the bottom of the hollow bolt 28. This fountain pen works in a similar manner as the embodiment according to Fig. 1, the main difference consisting in that when the container 9 is empty and is thrown away, only the piston 12 is to be cast off therewith, while the bolt 23 remains in the fountain pen. Before inserting the new container of pulpy ink into the fountain pen the bolt 23 is to be turned until the nut 25 is brought to its lower extreme position.

The embodiment represented in Fig. 4 is similar to the construction shown in Fig. 3, however, it differs from the same in that it allows a lengthening of the tube-like container 9. With this object in view, in this embodiment instead of the rotating member 24 according to Fig. 3 a sleeve 30 provided with inner threads is employed, which operates another sleeve 31 provided with outer threads. The latter is rigidly connected with a cap 32 guided in the hollow body 1 in lengthwise direction, furthermore with a bolt 33, on the end of which a rotatable connecting member 34 is mounted, the latter transfers the pressure of spring 35 to the piston 12 of the container 9. If the container 9 is filled with pulpy ink, the whole sleeve 31 is in the driving sleeve 30 and the cap 32 slides on the end portion of the sleeve 30, by which the tube-like container 9 may be lengthened as compared with the container of the embodiment according to Fig. 1.

As it follows from the above developments, the member pressing out the pulp, for instance piston 12, cannot be removed from the container, consequently when the container is empty, this member must be thrown away with the container and the spare containers are to be sold together with such a piston. This is preferable on account of the fact that if the end of each container would not be closed by its own piston, that is if the user himself should insert the piston of the fountain pen into the new container, an air bubble could easily remain between the piston and the pulp which would be very detrimental for the operation of the fountain pen.

In the known fountain pens working with a ball, the latter is mounted in a ball-shaped depression. This bearing must have a very exact finish, as the least discrepancy from the spherical surface causes in practice a loosening of the ball in its bearing which prevents a good working of the fountain pen.

According to the invention this disadvantage is avoided in such a way that according to Fig. 5 the broader part of the bearing is widened, so that the ball bears only at its writing part and opposite thereto on an annular surface 37 and 38 respectively of the said bearing. By this it

is attained that the finishing of the bearing depression is rendered very simple as only these two annular surfaces are to be made exact. The ball is continuously in precise contact with these annular surfaces and thus between the ball and these surfaces only the slight interspace is present, which is unavoidable on account of the not fully smooth surface of the used material. This small space suffices for applying the formerly mentioned very thin color-layer to the writing surface. This embodiment has the further advantage that the annular space assures beside the ball a small quantity of pulpy ink, which renders possible a uniform supply of the pulpy ink to the said ball and surely prevents a drying up of the ink as at the leaving place of the pulpy ink there is a greater quantity of the non-drying liquid.

I claim:

1. In a fountain pen with a rotatably mounted small ball as writing means for pulpy ink, an interchangeable container for the pulpy ink, a piston in the said container for pressing the pulpy ink forward, a screw bolt screwed into the said piston and adapted to forward the said piston if rotated, the end of the said screw bolt projecting out of the said piston and of the said container, a spring acting onto the said end of the screw bolt and adapted to hold the pulpy ink under pressure, the said container being adapted to be

replaced after use together with the said piston and the said screw bolt by a filled container of similar description provided with a piston and a screw bolt, this second mentioned container corresponding to the component parts of the fountain pen.

2. In a fountain pen of the type having a barrel and ball at the outer end of the barrel acting as a writing means for pulpy ink, an interchangeable tube like container for the pulpy ink in the barrel, a piston in the said container for pressing the pulpy ink forward, means for exerting pressure on the said piston including a rotatable driving sleeve mounted at the inner end of the barrel and provided with inner threads, a driven sleeve provided with outer threads and in threaded engagement within the driving sleeve, a cap member mounted on said driven sleeve, a bolt on the outer end of said driven sleeve and passing through said cap member a spring surrounding said bolt, a rotatable connecting member mounted on the outer end of said bolt to transfer the pressure of said spring to the piston, the driven sleeve fitting entirely within the driving sleeve, when the piston is in its retracted position, and the cap member sliding over the driving sleeve when it is desired to effect a lengthening of the tube like container.

LÁSZLÓ JÓZSEF BIRÓ.

Dec. 2, 1941.

L. J. BIRO

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FOUNTAIN PEN FOR PULPY INK

Filed Dec. 27, 1938

Fig 1

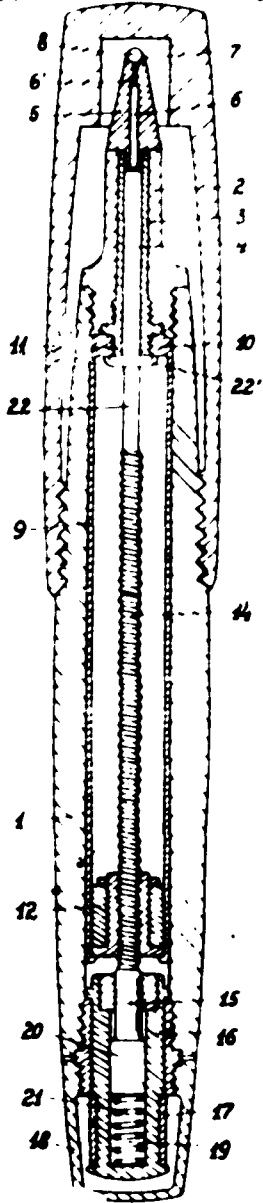


Fig 3

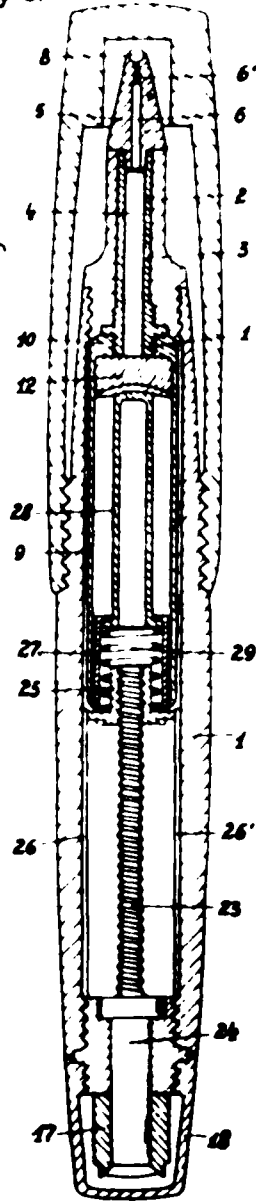
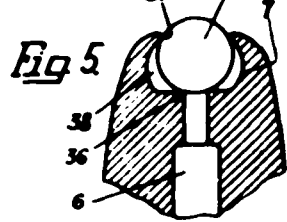
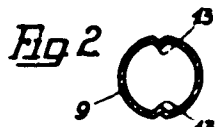
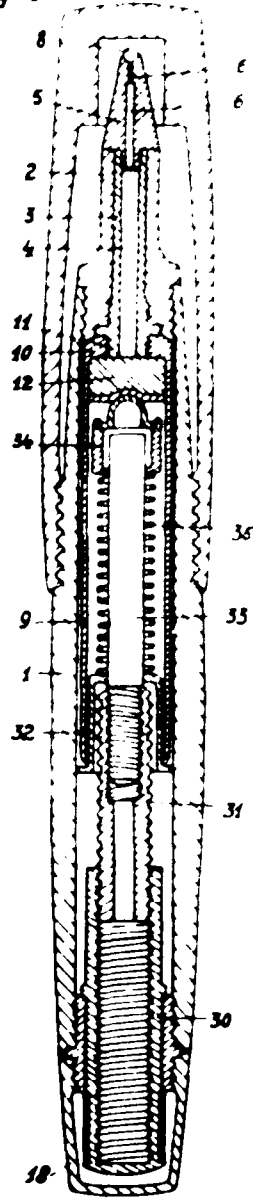


Fig 4



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COMMONWEALTH OF AUSTRALIA.

PATENT SPECIFICATION

122,073

Application Date : 8th Dec., 1943. No. 12,167/43.

Applicant (Assignee of Actual Inventor) ... HENRY GEORGE MARTIN.
Actual Inventor ... LASZLO JOZSEF BIRO, of Argentina.
Application and Complete Specification ... Accepted, 21st August, 1946.
Acceptance Advertised (Sec. 50) ... 5th September, 1946.

1
 Patent
 Specification
 No. 122,073
 8 December
 1943

Class 49.1.

Drawings (2 sheets) attached.

COMPLETE SPECIFICATION.

"Improvements in writing instruments."

I, HENRY GEORGE MARTIN, British Subject, Public Accountant, resident of Avenida Roque Saenz Pena No. 547, Buenos Aires, Argentina, whose Post Office address is Avenida Roque Saenz Pena No. 547, Buenos Aires, Argentina, hereby declare this invention and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

This invention relates to improvements in fountain pens of the ball tip type, and particularly to means for providing a regular ink feed to the ball constituting the active or writing element of said instrument.

The most suitable ink for ball-tip fountain pens is so-called "dense" ink, which is very adhesive, and the ball, in rotating, will transfer to the exterior a regular and sufficient quantity to make neat and normal strokes.

Although dense, such ink is sufficiently fluid to pass through small orifices, and it is therefore difficult to prevent leakage while still providing a permanently open

air intake and one object of this invention is to prevent leakage even when the pen is held with the air intake downwardly.

In the case of a barrel-shaped reservoir, the mass of ink will change its position as the instrument is moved about, so that when the tip of the pen is raised contact between the ink and the ball is lost, with the result that normal working of the instrument may be interrupted or impaired; another object of the invention is to overcome this difficulty.

Another object of this invention is to provide an ink reservoir wherein gravity does not alter the position of the ink and wherein the charge is kept in a satisfactory condition and forms a continuous vein of liquid to provide a continuous feed as and when required without delay or interruption.

A still further object is to provide an ink reservoir of simple structure which will at the same time be strong.

A still further object is to provide means for replacing the charge of ink

by having detachable reservoirs.

A still further object is to provide a simple writing instrument of the fountain-pen type which will not require auxiliary means for causing the ink to reach the writing ball.

According to the present invention an instrument of the ball tip type is provided in which the ink reservoir is formed by one or more conduits starting at an air intake, and after following an extended path, communicating with the recess for said ball, the said conduit or conduits being of so small a cross section that a suitable ink cannot escape from the air intakes under the effect of gravity.

According to one method of carrying the invention into effect the ink reservoir is constituted by one or more conduits arranged in the form of a helical coil.

The above and other objects and advantages of the present invention will become apparent from the following description, when read in conjunction with the accompanying drawings illustrating, by way of example some of the preferred embodiments of the invention, and wherein:—

Figure 1 is a view of one form of the writing instrument, partially in section so as to disclose the interior thereof;

Figure 2 is a cross-sectional view taken along the line **N-N** of Figure 1;

Figure 3 is a schematic view of the helical conduit constituting the ink reservoir of another form of writing instrument;

Figure 4 and Figure 5 show further embodiments;

Figure 6 is a schematic view of another form of conduit;

Figure 7 shows a further embodiment, wherein the reservoir is constituted by a detachable member within the fountain-pen casing; and

Figure 8 is a view showing the separation of the reservoir.

The same reference characters are used to indicate like or corresponding parts or elements throughout the drawings.

As may be seen from the drawings **a** is the casing of the writing instrument terminating in a tip **b** carrying the writing ball **1**. This ball is suitably mounted so as to project sufficiently to engage the writing surface. The ball is held by its housing **2** sufficiently tightly to form a closure but the ball is free to rotate and

hold a coating of ink which will pass out of the instrument when the ball is rotated in writing.

In order to constitute the housing for said ball **1**, said tip **b** is provided with a recess **3** with which the ink feeding channel **4** receiving the liquid from the reservoir **c** communicates.

Said reservoir **c** is constituted by at least one conduit **5**, which is preferably helical and, as shown in the drawings, starts at the air-intake **6**, extending to the feeder **4**.

In the embodiment of Figure 1, the reservoir **c** is formed by combining a body **7** and a cylinder **8** constituted by the casing **a**. For this purpose, said body **7** is threaded so as to provide a helical channel **5'**. The throat of said channel **5'** is relatively small, for example of a section of less than 5 m.m.². The body **7** will cooperate with the cylinder **8** so that when the body **7** is housed within said cylinder, the channels **5'** will be closed by the said cylinder **8**. Under these conditions, said channels **5'** will form a coil-like conduit capable of containing a continuous vein of liquid ink.

In the schematic embodiment in Figure 3, the conduit is constituted by a tube having a small section made in the form of a helical coil.

The embodiment shown in Figure 4 comprises a helical conduit similar to that of Figure 1, but with the difference that channel **5'** is formed by a screw-thread provided on the inner wall of cylinder **8**. In this case, the body **7** is smooth and upon being inserted into the threaded wall forming the channel **5'**, said body **7** will close the channel and form a helical conduit **5**, capable of containing a vein of liquid ink, extending from the air-intake **6** to the feeding channel **4**. In this embodiment the air intake **6** is protected by a cap **9** having an orifice **6'**.

Figure 5 shows a further embodiment of the invention, similar to that of Figure 1 in that the reservoir consists of a conduit formed by a cylinder **8** and body **7**, except that in this instance, the threaded body **7** has two adjacent channels following the same helical course, after the fashion of a screw with two threads. The starting point of each channel will constitute an air intake **6**, and both the screw

threads terminate at the feeding channel 4, as shown.

Figure 6 illustrates a further embodiment of the invention, wherein the conduit 5, instead of being helical, is formed by annular convolutions which are not circumferentially closed, but communicate in series so as to form a coil which, when charged with ink, will contain a vein of liquid extending from the air intake 6 to the feeding channel for said ball 1.

In the embodiment of Figures 7 and 8, the reservoir c is formed in a member which is independent of the casing a and detachably housed within the said casing. In this instance, the reservoir c is formed by a member c having a cylinder 10 terminating in a nozzle 10', through which the tube 4' of feeder 4 is screwed. Within said cylinder 10, is a body 7 which, being threaded as in the embodiment of Figure 1 co-operates with the walls of said cylinder 10 so as to form a helical conduit 5 terminating at the tube 4' so that when charged with ink, it will contain a vein of liquid which will reach the ball 1 in the same manner as in the previous embodiments.

Inasmuch as the casing a will serve as a casing for the member c constituting the reservoir c, it will be sufficient to detach said casing as shown in Figure 8, in order to remove the member c'. In order to remove said member c' it should be unscrewed from tube 4' when it will be free for removal and replacement. Thus, when the ink in the fountain-pen has been exhausted, the charge may be replaced through the simple replacement of said member c' and body 7 together constituting the reservoir.

From the foregoing it may be seen that in any of the embodiments illustrated in the different figures, the reservoir c' is constituted by a conduit starting at the air intake 6 and ending at the feed channel 4.

In charging the writing instrument with dense ink, all the cavities of the system constituted by the channels should be filled, or, in other words, there should be a full charge, from the air intake 6 to the ball 1.

Inasmuch as the conduit 5 of said reservoir c is of small section, when charged

with ink it will contain an uninterrupted vein of liquid, as if it constituted an extension of channel 4. Due to this and other relatively adjusted arrangement of said ball 1 in the setting 2, whereby the tip of the instrument remains closed, the ink cannot discharge by gravity.

Notwithstanding the adjustment of the setting 2, the ball 1 will act as an intermediary means between the ink charge and the writing surface, since due to the adhesive properties of the ink, upon rotating said ball it will be coated therewith, said coating passing out of the instrument so as to define perfectly regular strokes.

As the ink is used through use of the instrument, the charge in the form of a vein of liquid will be displaced so as to occupy the space of the portion carried out by the ball.

Said vein of liquid remains uninterrupted and is displaced as a whole the rear terminal thereof being in contact with the atmosphere by means of said air intake 6, and therefore the continuity thereof will subsist as the ink is used, and there will be no risk of interruptions.

The vein of ink reaches the ball through the feeding channel 4, and is always in contact therewith so that the feed will be permanent and the instrument will at all times be ready for use.

Inasmuch as the reservoir c is formed by a coil of small section the instrument may be placed in any position and used in any manner without the vein of liquid being affected by gravity.

It is obvious that in carrying the invention into practice, several changes in construction and detail will occur, to those skilled in the art, without departing from the scope of the invention as clearly set forth in the appended claims.

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:—

1. Improvements in writing instruments of the ball-tip type, wherein the ink reservoir of said instrument is formed by one or more conduits starting at an air intake and, after following an extended path, communicating with the recess for said ball, the said conduit or conduits be-

122,073

ing of so small a cross-section that a suitable ink cannot escape from the air intake under the effect of gravity.

2. Improvements in writing instruments as claimed in Claim 1 wherein the conduit or conduits constituting the reservoir is or are in the shape of a helical coil.

3. Improvements in writing instruments as claimed in Claim 1 or Claim 2, wherein the conduit forming the ink reservoir is formed by the combination of a threaded body snugly fitted within a cylinder formed by the casing of the instrument.

4. Improvements in writing instruments as claimed in Claim 1 or 2 wherein the conduit forming the ink reservoir is formed by the combination of a body snugly fitted within an inwardly threaded cylinder constituting the casing of the instrument.

5. Improvements in writing instruments as claimed in Claim 1 wherein said reservoir is constituted by a plurality of helical conduits terminating at the feed channel for said ball.

6. Improvements in writing instruments as claimed in Claim 1, wherein said

ink reservoir is formed within a member detachably fitted within the casing of said instrument.

7. Improvements in writing instruments as claimed in Claim 1 and 6 wherein said member fitted within said casing is screwed to a tube constituting an extension of the ball feeding channel.

8. Improvements in writing instruments as claimed in Claim 1, wherein the conduit of said reservoir is formed by unclosed annular convolutions successively communicating with each other.

9. Improvements in writing instruments as claimed in Claim 1, wherein said conduit is smaller than 5 m.m. in section.

Dated this 4th day of September, A.D. 1946.

HENRY GEORGE MARTIN, 20

By his Patent Attorneys,

PHILLIPS, ORMONDE, LE PLASTRIER & KELSON,

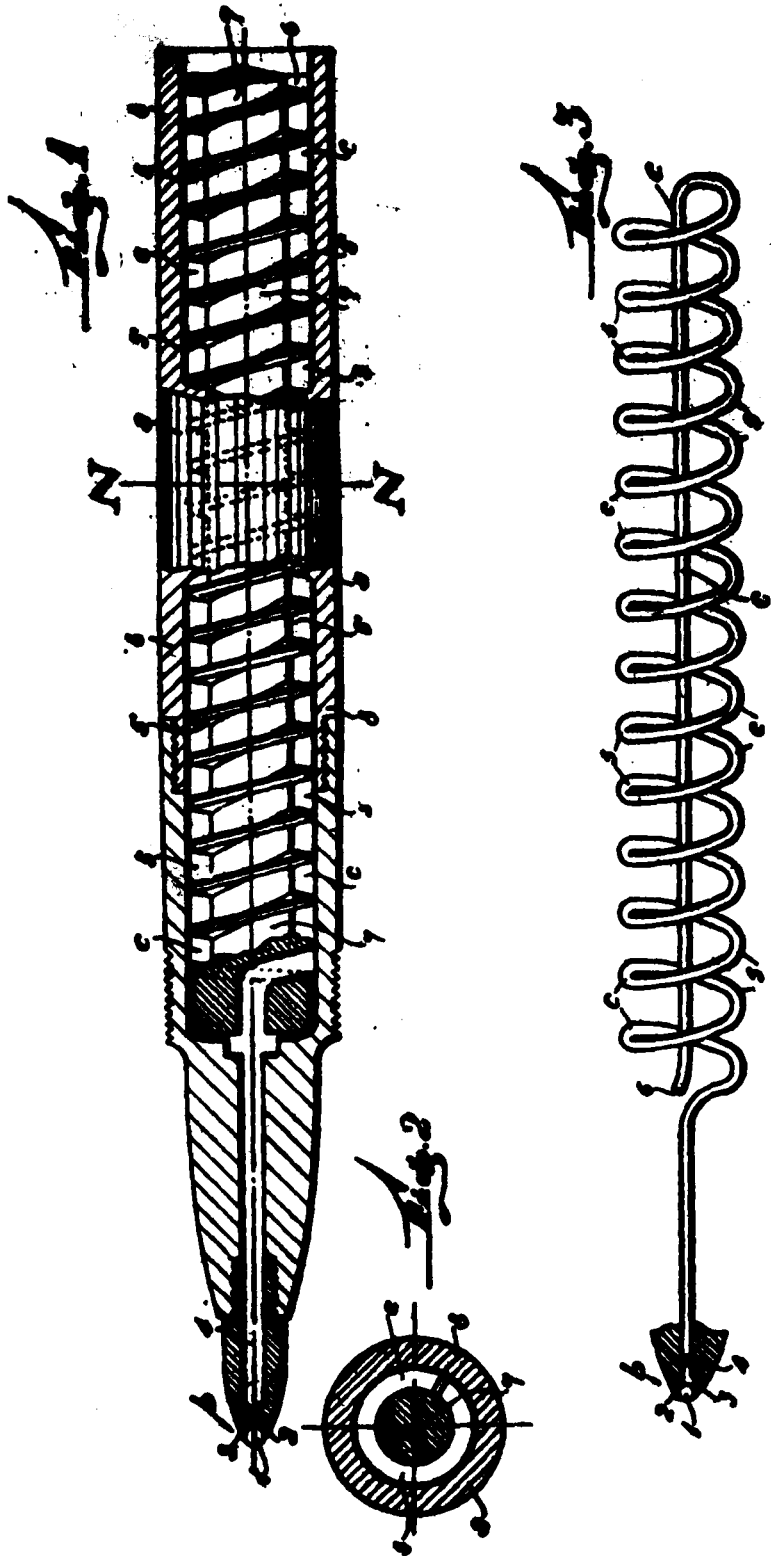
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Fellows Patent Institute of Attorneys of Australia. 25

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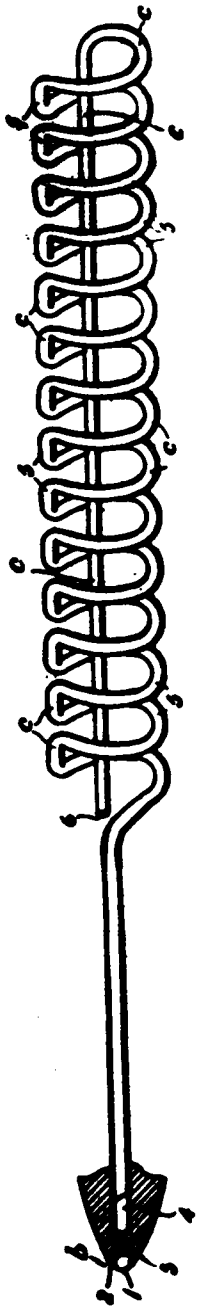
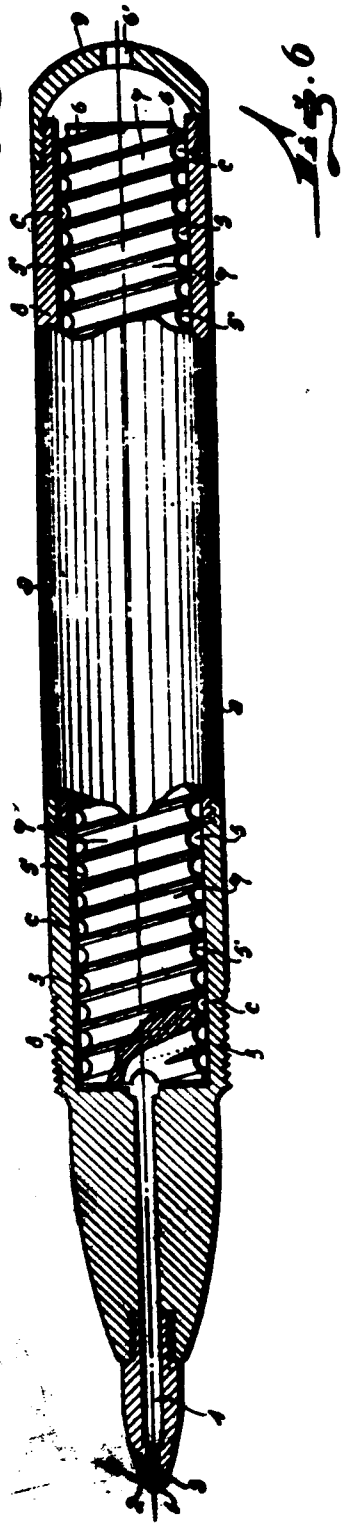
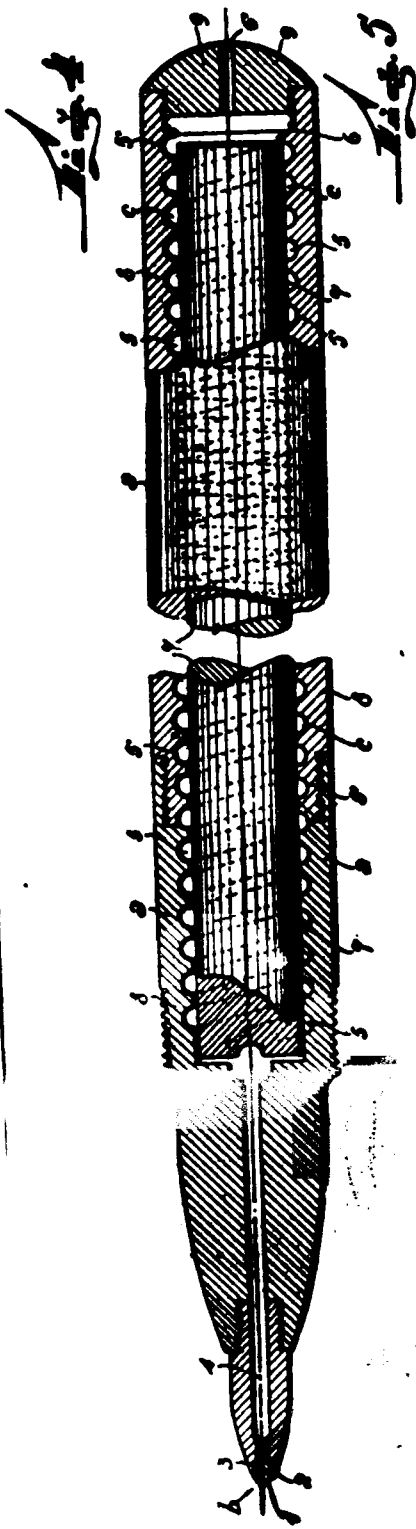


Fig. 7

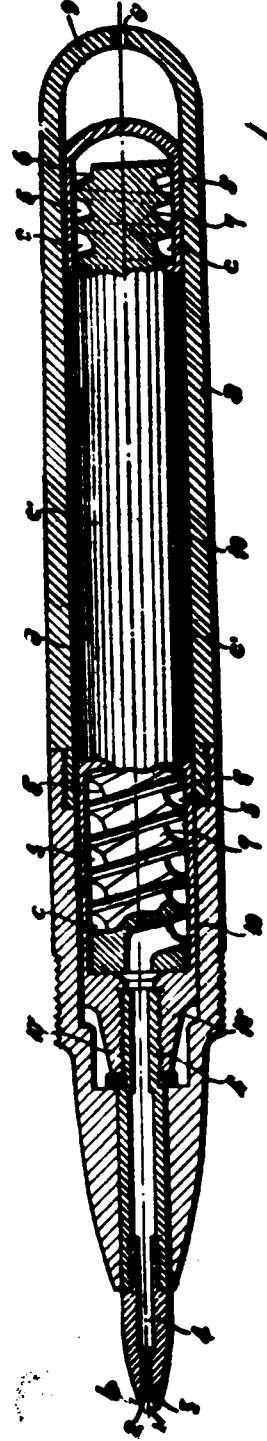
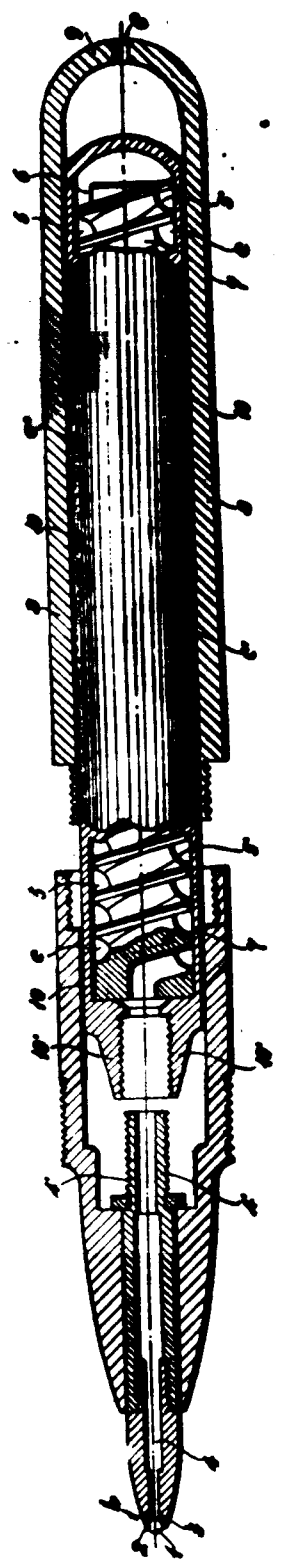


Fig. 8



EXHIBITS.

—
Exhibit " 2 "—Amended Specification No. 133163 with red ink alterations.
—————

Exhibits.

—
2.
Amended
Specifica-
tion
No. 133163
with
red ink
alterations,
18th
December
1946.

72

290

Revised
(Subject to
objection)



BATCH

Patent Office Form 88.

The "original" Specification is forwarded herewith for printing in standard form; to be read and revised at the Printing Office.

Heading Sheet,

prepared by

COMMONWEALTH OF AUSTRALIA.

PATENT SPECIFICATION.

133,163

Application Date:

31st Dec, 1943 No 12,477/43

~~Under International or Interoceania Arrangements~~

Complete Specification Published

19th February 1948

Complete Specification Accepted

14th June, 1944

Classes

49

~~No drawing~~

Drawing attached.

~~Drawing (sheet) attached~~

COMPLETE SPECIFICATION.

Improvements in writing instruments

This invention relates to writing instruments of the type in which a ball is mounted for rotation in a housing with part of the ball exposed and is supplied with ink from a suitable reservoir, the arrangement being such that as the ball is rotated such as by being moved relatively to and in contact with a writing surface the ball carries a quantity of ink through the housing, which ink is deposited on said surface and a trace is made.



An object of the present invention is to improve the construction of instruments of the aforesaid type. According to this invention, I provide ^{specified, having} an instrument of the said type ~~is provided~~

~~in which the ink reservoir for the ball is constituted by a vented tube of capillary size in which when charged with viscous ink a continuous liquid vein is maintained extending from the ball, and having a feed duct leading from the reservoir to the ball, the cross sectional area of which duct, particularly that portion adjacent the ball, being less than that of the reservoir. The capillary~~
~~rotatably mounted ball. It is preferably in the form of a~~
~~vented tube of capillary size is employed herein in relation to the reservoir of a writing instrument of the~~
~~series of limbs, each substantially parallel to the longitudinal~~
~~axis of the instrument so that a comparatively long length of~~
~~tolerance of the order of $\pm 5\%$ so that when charged with a viscous ink the meniscus formed at the end~~
~~of the ink column remote from the ball (at the interface between the ink, the air and interior surface of~~
~~the tube) is stable and will not break under shocks to which the instrument is subjected in normal use.~~

~~of the tube remote from that end which is open to atmosphere~~
~~The tube is preferably in the form of a series of limbs, each substantially parallel~~
~~conveniently communicates with the ball by way of a duct which~~
~~to the longitudinal axis of the instrument so that a comparatively long length of continuous tube can~~
~~be accommodated in a comparatively small compass such as the usual type of fountain pen casing. The~~
~~diameter or cross sectional area of the tube or is smaller. The~~

term "tube" as used herein where the context so permits includes a tube like duct formed in a body.

In order that the nature of the invention may be more readily understood reference will now be made to the accompanying drawings in which:-

Figure 1 is a cross sectional view illustrating by way of example one embodiment of the present invention.

25

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START

Figure 2 is a diagrammatic representation of the embodiment illustrated in Fig. 1.

Figure 3 is a cross sectional view illustrating another embodiment.

Figure 4 is a cross section on line M-N. Fig. 3.


Figure 5 is a cross section on line S-S Fig. 3.

Figure 6 is a diagrammatic representation of the embodiment illustrated in Figs. 3, 4 and 5.

~~Figure 7 is a perspective view of yet another embodiment and~~

~~Figure 8 is a cross section view on Fig. 7.~~

The same numbers and letters of reference have been used to indicate like or corresponding parts in all the several views.

As will be seen by referring to the drawing  the body part of the pen or holder, terminating in a point 1, whereat by means of a suitable housing 2, the small sphere 11 3 which forms the writing element is rotatably mounted with part of the ball exposed; said ball is in contact with the ink supplied by the feed ^{duct} channel 4 which, in turn, receives its

supply from the reservoir b.
While the ball may be of any appropriate size, it is preferably of a diameter on the order of 1/16 in.
The reservoir b is formed by a duct, forming an extension of the feed ^{duct} channel 4, constituted by a plurality of lengths or duct sections 5, preferably arranged in parallel relationship to the longitudinal axis of the body of the holder a; the reservoir thus forms a series or group of duct sections occupying the greater part of the body a; said sections 5 are connected together and communicate in series, one in continuation of the other, so as to form, as a whole, one single channel, commencing at the inlet or air intake 6 and ending at the feed duct 4 of the ball 3.

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The feed duct 4, or at least that portion adjacent the ball, is of lesser cross sectional area than that of the reservoir, as indicated in Figs. 2, 3 and 5, where reference 4a denotes the relatively smaller cross sectional portion of the feed duct. Similarly that portion of the feed duct of Figure 1 extending from a position such, for example, as indicated by line A to the ball recess will be of smaller cross section than that of the reservoir.

This invention is adapted for construction in many ways, among which are to be particularly noted the embodiments shown in the several Figures of the accompanying drawings.

In the embodiment according to Fig. 1, the reservoir b is formed by a ^{cur} capillary ~~duct or tube~~ which, being connected to the feed channel 4, extends parallel to the holder a, and as the tube is folded several times by a bend through 180°, the same will form a group of several sections 5 of reduced length with the bends 5' establishing communication between the several sections, so that all of the sections are connected in series. The ink reservoir b is removably housed within the holder a, which in this case is hollow.

The duct which forms the reservoir b is filled with a viscous or semi-fluid ink, thus establishing a fluid vein extending when the reservoir is full from a point near the inlet or air intake 6 to the ball 3, which is in contact with the ink; consequently when the ball is rotated such as by being rolled over a suitable surface, the ball will make a trace with the ink supplied from the said liquid vein.

In the embodiment of Figs. 3, 4, 5 and 6 the reservoir b is also formed by lengths or sections 5, but in this case, said sections are constituted by ducts formed in the body of the holder a.

Said ducts extend longitudinally in a parallel arrangement, and are closed at both ends, such as by means of the head piece c, constituting the point 1, and the head piece d. The head piece c is threaded at 7 into the body a, while the part d is threaded at 8 into said body a, as may be seen by referring to Fig. 3.

As shown, the channel sections 5 are enabled to


communicate with each other, by means of passages 5', so that all the sections together form a continuous single linear duct.

5 One of the duct sections, indicated at 5", ends with an air intake 6 preferably directed towards the point 1, but at a certain distance short of the same.

In the embodiment illustrated in Figs. 3, 4, 5 and 6, when the instrument is filled with ink, a liquid vein is established which extends without interruption up to the ball 3.

10 ~~With reference to the embodiment shown in Figs. 7 and 8,~~ it will be seen that the reservoir b is constituted by a striated body e, arranged to fit snugly within the cavity a' of the body a, which in this case is of tubular shape.

Said striated body e is formed with longitudinal grooves which together with the wall of the cavity a' constitute the duct sections 5.

15  After inserting the striated body e within the body a, the parts c and d are fitted by screwing at 7 and 8, in a manner similar to that shown in Fig. 3; in this embodiment also, 20 the duct sections 5 communicate one with another in series, so as to constitute a continuous linear duct forming the reservoir b. The body c is provided with an axial bore forming part of said duct which communicates with the feed duct 4 closed by the ball 3.

25 In all the embodiments the duct is charged with a viscous ink so that a continuous liquid vein is formed communicating with the ball 3.

It will be evident that in carrying the invention into practice, modifications may be introduced with regard to

295

AMENDED

124.9913

133163

certain details of construction and shape of the instrument,
without departing from the basic principles of the invention,
as set forth in the claims hereto annexed.

AMENDED 1249913
133163

HAVING NOW FULLY described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:

- 1 tube specified, having the ink reservoir constituted by a vented tube of*
1. An instrument of the ~~said type in which the ink reservoir~~ *in which when charged with viscous ink a continuous liquid vein, substantially that form* ~~for the ball is constituted by a capillary tube~~ *of the ball, extending from the ball, and having a feed duct leading from the reservoir to the ball, the*
 2. An instrument according to Claim 1 in which the tube is open to atmosphere at one end and the other end communicates with the ball.
 3. An instrument according to Claim 2 in which the tube communicates with the ball by way of a duct of the same or smaller cross-sectional area or diameter than the tube.
 4. An instrument according to any of the foregoing claims in which the tube is formed into limbs, substantially parallel to the longitudinal axis of the instrument.
 5. An instrument according to Claim 4 in which the open end of the tube is directed towards but does not extend to the ball.
 6. An instrument according to any of the foregoing claims in which the ink reservoir is adapted to be removably received within a casing.
 7. An instrument according to any of the Claims 1 to 6 in which the tube is constituted by a duct formed in a body.
 8. An instrument according to Claim 7 in which a series of parallel ducts is formed in a body positioned within an outer casing, said ducts being each connected by a passage, an end closure being provided (removably or otherwise) at each end of said body, one end of one duct being open to atmosphere and the arrangement and disposition of the parts being such that there is formed a single linear duct extending from the opening to atmosphere to the ball.
 9. An instrument according to any of the foregoing claims when charged with a viscous or semi-fluid ink.

cross-sectional area of which duct is smaller than that of the reservoir

particularly that portion adjacent the ball, being less than that of the reservoir

10



An.

297 AMENDED 12499 43
133163

9
An instrument constructed and arranged substantially
as described herein with reference to the accompanying drawings.



Dated this 15th day of December 1946.

HENRY GEORGE MARTIN
By his Patent Attorneys:
PHILLIPS, ORMOND, ~~MASTRIK~~ & NELSON

MEMBER FIRM OF PATENT ATTORNEYS
OF AMERICA

Leslie W. Le Plastrier

L. Spinks
WITNESS:

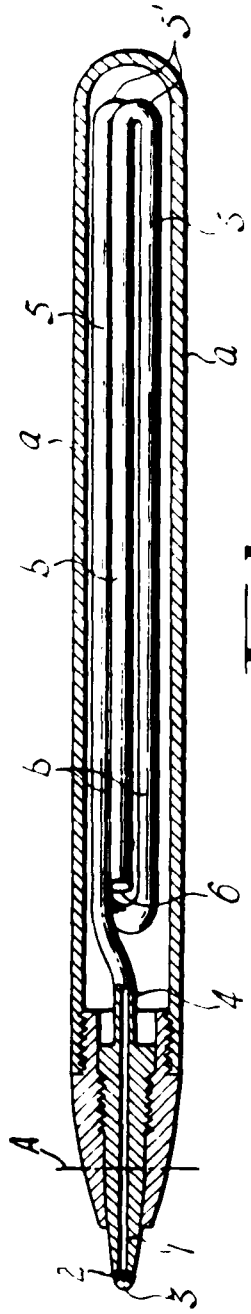


FIG. 1.

133163 E

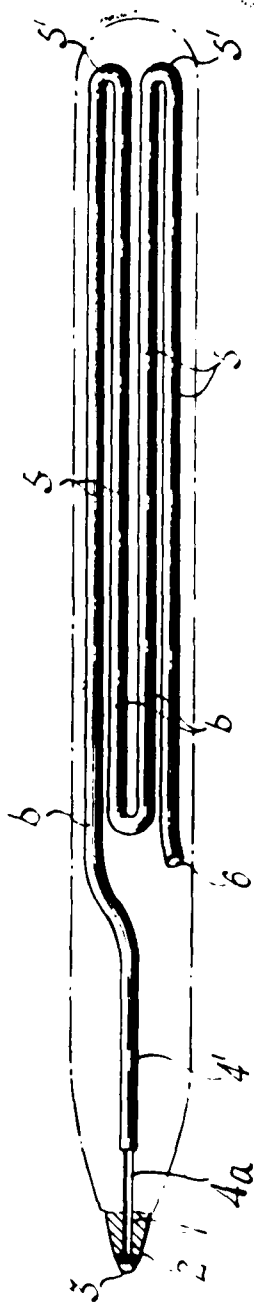


FIG. 2.

HENRY GEORGE MARTIN
BY:

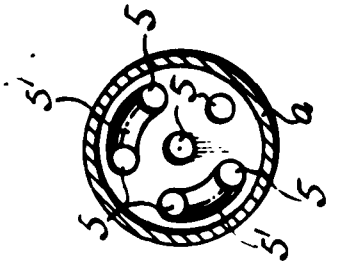


FIG. 4.

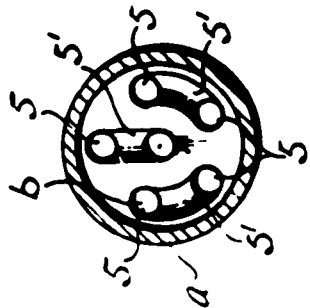


FIG. 5.

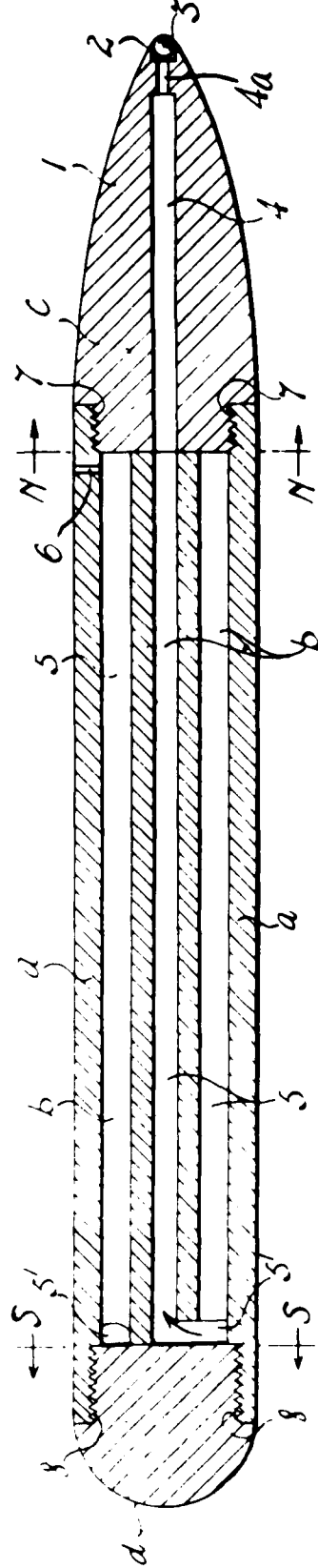


FIG. 3.

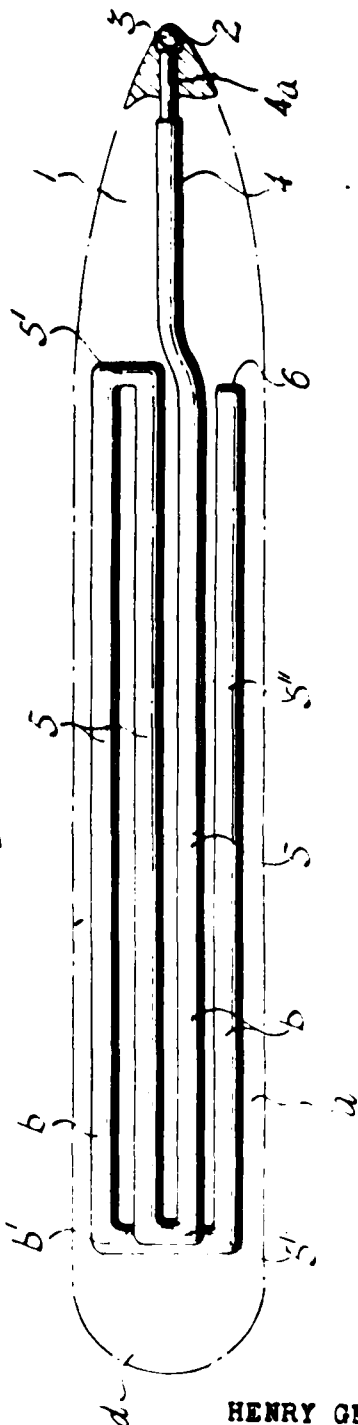


FIG. 6.

HENRY GEORGE MARTIN
BY:

391331

EXHIBITS.

Exhibits.

Exhibit " 2 "—Sheet of Proposed Amendments.

THE COMMISSIONER OF PATENTS : 28th January, 1948

IN THE MATTER of Application No. 12,499, filed 31st December, 1943, in the name of HENRY GEORGE MARTIN.

2.
Sheet of
proposed
amend-
ments,
28th
January
1948.

SHEET OF PROPOSED AMENDMENTS.

1. Page 2, line 14, after "atmosphere" insert "(or could, for example, be fitted with a rubber tube so long as the said end is under the influence of atmospheric pressure)."

10 2. Page 2, between lines 25 and 26, insert a paragraph reading :—

"The invention may be said to consist primarily of a writing instrument having a ball tip and an ink reservoir which consists of a tube which at the one end communicates with a recess for the ball and at the other end is under the influence of the atmospheric pressure, characterized in that the inner cross sectional area of the tube throughout that portion of its length which is adapted to contain ink and the viscosity of the ink are mutually determined in such way that the ink extends as an un-broken continuous vein in a direction from the ball, where it is maintained by capillary action, and likewise by capillary action and the viscous resistance of the ink is prevented from flowing out through the said other end on the normal use of the pen."

20

3. Page 5, line 21, after "duct" insert "extending from an air intake 6 and."

4. Cancel Claim 1 and replace by the following :—

"A writing instrument having a ball tip and ink reservoir which consists of a tube which at the one end communicates with a recess for the ball and at the other end is under the influence of the atmospheric pressure, characterized in that the inner cross sectional area of the tube throughout that portion of its length which is adapted to contain ink and the viscosity of the ink are mutually determined in such way that the ink extends as an unbroken continuous vein in a direction from the ball, where it is maintained by capillary action, and likewise by capillary action and the viscous resistance of the ink is prevented from flowing out through the said other end on the normal use of the pen."

30

5. In Figures 3 and 7 of the drawings, show an air intake as indicated by the numeral 6 on prints of the two sheets of drawings annexed hereto.

Dated this 28th day of January A.D. 1948.

40

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

GS/MS

Exhibits.

EXHIBITS.

2.
Sheet of
proposed
amend-
ments,
16th
November
1948.

Exhibit " 2 "—Sheet of Proposed Amendments.

THE COMMISSIONER OF PATENTS : 16th November, 1948.

IN THE MATTER of Application No. 12,499, filed 31st December,
1943, in the name of HENRY GEORGE MARTIN.

SHEET OF PROPOSED AMENDMENTS.

6. Page 2, replace the second paragraph by the following :—

“ An object of the present invention is to improve the construction of instruments of the aforesaid types. According to this invention, I provide an instrument of the type specified, having the ink reservoir constituted by a vented tube of capillary size in which when charged with viscous ink a continuous liquid vein is maintained extending from the ball, and having a feed duct leading from the reservoir to the ball, the cross sectional area of which duct is less than that of the reservoir. The expression ‘ a vented tube of capillary size ’ is employed herein in relation to the reservoir of a writing instrument of the type specified to mean a tube the cross sectional shape of which is devoid of sharp corners and the internal diameter of which is not more than 3·5 mm. nor less than 0·5 mm., and which is vented at a location remote from the ball in such manner that when charged with ink the end of the ink column or vein is exposed to atmospheric pressure. The tube is preferably in the form of a series of limbs, each substantially parallel to the longitudinal axis of the instrument so that a comparatively long length of continuous tube can be accommodated in a comparatively small compass such as the usual type of fountain pen casing. The term ‘ tube ’ as used herein where the context so permits includes a tube like duct formed in a body.”

7. Page 3, cancel lines 9, 10 and 11 relating to Figures 7 and 8 of the drawings.

8. Page 3, between lines 20 and 21, insert the following :—

“ While the ball may be of any appropriate size, it is preferably of a diameter in the order of 1 mm.”

9. Page 5, cancel lines 10 to 24 inclusive.

10. Cancel Claim 1 and replace by the following :—

“ 1. An instrument of the type specified, having the ink reservoir constituted by a vented tube of capillary size in which when charged with viscous ink a continuous liquid vein is maintained extending from the ball, and having a feed duct leading from the reservoir to the ball, the cross sectional area of which duct is less than that of the reservoir.”

11. Cancel Claim 3.
12. Change the ordinal of Claim 4 to 3.
13. Change the ordinal of Claim 5 to 4 and, in line 1, change "Claim 4" to "Claim 3."
14. Change the ordinal of Claim 6 to 5.
15. Change the ordinal of Claim 7 to 6 and, in line 1, change "Claims 1 to 6" to "Claims 1 to 5."
16. Change the ordinal of Claim 8 to 7 and, in line 1, change "Claim 7" to "Claim 6."
- 10 17. Change the ordinals of Claims 9 and 10 to 8 and 9.
18. Cancel Figures 7 and 8 of the drawings.

Dated this 16th day of November A.D. 1948.

HENRY GEORGE MARTIN,
By his Patent Attorneys :—

GS/MS

Exhibits.

2.
Sheet of
proposed
amend-
ments,
16th
November
1948,
continued.

Exhibits.

EXHIBITS.

2.
Sheet of
proposed
amend-
ments,
10th
March
1949.

Exhibit " 2 "—Sheet of Proposed Amendments.

THE COMMISSIONER OF PATENTS : 10th March, 1949.

IN THE MATTER of Application No. 12,499, filed 31st December,
1943, in the name of HENRY GEORGE MARTIN.

SHEET OF PROPOSED AMENDMENTS :

19. In the first paragraph of Item 6 of the amendments, dated 16th November, 1948, delete the word " is " in line 11 and replace by the following :—

" particularly that portion adjacent the ball, being." 10

20. In proposed Claim 1, as set out in Item 10 of the amendments dated 16th November, 1948, delete the word " is " in the second last line and replace by " , particularly that portion adjacent the ball, being."

21. Page 3, lines 19 and 22, change " channel " to " duct." (This amendment is suggested in order to preserve consistency of terms.)

22. Page 3, at the end of line 20, insert the following :—

" The feed duct 4, or at least that portion adjacent the ball, is of lesser cross sectional area than that of the reservoir, as indicated in Figures 2, 3 and 6, where reference 4a denotes the relatively smaller cross sectional portion of the feed duct." 20

23. Page 4, line 5, change " capillary duct or tube " to read " tube of capillary size." (This amendment is also submitted in order to preserve consistency in terms.)

24. In Figures 2, 3 and 6 insert the reference ' 4 ' and lead-in lines denoting that portion of the feed duct adjacent the ball 3 which is of smaller cross sectional area than the reservoir channel.

Dated this 10th day of March A.D. 1949.

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

GS/MS

30

EXHIBITS.

Exhibits.

 Exhibit " 2 "—Sheet of Proposed Amendments.

 2.
 Sheet of
 proposed
 amend-
 ments,
 11th
 March
 1949.

THE COMMISSIONER OF PATENTS : 11th March, 1949.

IN THE MATTER of Application No. 12,499 filed 31st December,
 1943, in the name of HENRY GEORGE MARTIN.

SHEET OF PROPOSED AMENDMENTS.

25. In the first paragraph of Item 6 of the amendments, dated 16th November, 1948, replace the sentence commencing in line 12 by the following :—

- 10 “ The expression ‘ a vented tube of capillary size ’ is employed herein in relation to the reservoir of a writing instrument of the type specified to mean a tube having an internal bore of between 1 and 4 mm. (subject to a manufacturing tolerance of the order of +, -, 5%) so that when charged with a viscous ink the meniscus formed at the end of the ink column remote from the ball (at the inter-face between the ink the air and interior surface of the tube) is stable and will not break under shocks to which the instrument is subjected in normal use.”

Dated this 11th day of March A.D. 1949.

20

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

GS/MS

*Exhibits.***EXHIBITS.**

2.
 Sheet of
 proposed
 amend-
 ments,
 16th May
 1949.

Exhibit " 2 "—Sheet of Proposed Amendments.**THE COMMISSIONER OF PATENTS :***16th May, 1949.*

**IN THE MATTER of Application No. 12,499, filed 31st December,
 1943, in the name of HENRY GEORGE MARTIN**

SHEET OF PROPOSED AMENDMENTS.

26. After the sentence inserted at the end of line 20, Page 3, vide amendment No. 22, dated the 10th March, 1949, insert the following :—

“ Similarly that portion of the feed duct of Figure 1 extending 10
 from a position such, for example, as indicated by line A to the ball
 recess will be of smaller cross section than that of the reservoir.”

27. In Figure 1 of the drawings, insert the vertical line and reference A, indicating the same as shown in red on the attached print.

Dated this 16th day of May A.D. 1949

HENRY GEORGE MARTIN,
 By his Patent Attorneys :—

Letter Form No. 41 (a).

EXHIBITS.

Exhibits.

Exhibit " 6 "—Letter from Patent Office to the Plaintiff's Patent Attorneys

6.
Letter from
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
19th
October
1945.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF PATENTS,

Patent Office,
Canberra, A.C.T. Oct. 19, 1945.

Gentlemen,

Application No. 12499/43 HENRY GEORGE MARTIN.

With reference to your Application for a patent numbered as above,
10 I have to inform you that the examiner has reported thereon as follows :—

The title has not been stated as prescribed for the reason that it does not sufficiently indicate the subject matter of the invention, which is concerned with a fountain pen.

The invention has not been described as prescribed for the reason that it does not fully describe and ascertain the invention with reference to the embodiment of Figures 3 and 7, as the inlet open to air, which is a feature of the claims, in not shown.

At line 22 page 2, the word " reserved " should read " reversed."

The application and specification are not as prescribed, for the reason
20 that the drawings are not prepared as prescribed, being blue prints.

Amended drawings were lodged 10th October, 1944, but are not as prescribed. The lines of the drawings are not of even thickness and gradation, and the reference characters are not clearly shown.

The amended drawings, especially figures 1, 2, 5 and 6, are not suitable for reproduction.

I am further directed to inform you that the Examiner has, under the provisions of Section 41, cited an application which is not yet open to inspection. You will be formally advised if and when the cited application becomes open to inspection. If necessary an extension of time for
30 acceptance will be granted under the provisions of Regulation 14 (2) (d).

Argument in rebuttal of the Examiner's objection or amendment with the view to the removal thereof may be submitted in writing for further reference to the Examiner. Every answer to the Examiner's objection will be officially regarded as a request for a further report by the Examiner

Exhibits. unless a notification that the applicant desires to be heard by the Commissioners, in accordance with the provisions of Sec. 119 of the Act, is lodged at the Patent Office.

6.
Letter from
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
19th
October
1945.
continued.

Messrs. Phillips, Ormonde,
Le Plastrier & Kelson,
Patent Attorneys,
Melbourne, Vic.

A. A. STIRLING,
Chief Examiner of Patents.

Particular attention is drawn to Sections 42, 45, 46, and 119 of the Patents Act 1903-1946 and Regulations 61 to 63 inclusive of the Patents Regulations 1912 printed on the back hereof. 10

As proceedings under the Patents Act 1903-1946 and Patents Regulations 1912 are subject to limitations of time, attention is also drawn to the provisions of Sections 38 and 48 of the Patents Act 1903-1946 and Regulations 14 of the Patents Regulations 1912, also printed on the back hereof.

Amendments proposed by way of answer to Examiner's Reports must be presented on sheets of paper separate from correspondence and the documents.

Proposed amendments to the drawings must be shown so as to clearly set out the proposed amendment. 20

EXHIBITS.

Exhibits.

Exhibit " 6 "—Letter from Patent Office to the Plaintiff's Patent Attorneys.

6.

Letter from
the
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
2nd
December
1946.

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF PATENTS.

BH

Patent Office,
Canberra, A.C.T.
Dec. 2-1946.IN THE MATTER of Application No. 12499/43 for Letters
Patent by HENRY GEORGE MARTIN.

10 Gentlemen,

With reference to your Application for a patent numbered as above, I have to inform you that the cited application No. 12167/43 (122,073) is now open to public inspection, and the Examiner's report thereon is as follows :—

“ To the best of my knowledge the invention is already the subject of a prior application for a Patent in the Commonwealth or in any State for the reason that the invention is already the subject of application No. 12167/43, Class 49.1 by same applicant lodged 8th December, 1943.

20 This objection is based upon claim 1. When the claim of the cited case is considered in relation to figure 6 thereof, it is clear that the subject of claim 1 of the present application is claimed.”

(D. J. WILKIE),

Acting Asst. Chief Examiner of Patents.

Messrs. Phillips, Ormonde Le Plastrier & Kelson,
37-41 Queen Street,
Melbourne, Vic.

*Exhibits.***EXHIBITS.**

6.
 Letter from
 Patent
 Office to
 the
 Plaintiff's
 Patent
 Attorneys,
 26th
 August
 1947.

Exhibit " 6 "—Letter from Patent Office to the Plaintiff's Patent Attorneys.

Letter Form No. 41 (A).

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF PATENTS.

DFP

Patent Office,
 Canberra, A.C.T.
 26th Aug. 1947.

Gentlemen,

Application No. 12499/43 HENRY GEORGE MARTIN.

10

With reference to your Application for a patent numbered as above, I have to inform you that the examiner has further reported thereon as follows :—

Further in response to official letter of 19th October, 1945 and 2nd December, 1946, the Attorneys with a letter dated 18th December, 1946, lodged on 18th December, 1946, amended specification and drawings. These lodgments are not adequate to remove all the objections communicated.

2. The Attorneys in a letter dated 18th December, 1946, requested the withdrawal of the objection to the title. In view of the submission of 20 amended claims, this objection to title is withdrawn.

3. No submissions have been made in reply to the objection of paragraph 2 of the official letter of 19th October, 1945, regarding the air inlet. The manner in which the relevant duct communicates with the atmosphere must be clearly illustrated in respect of all embodiments.

4. Further, the following objections obtain in respect of the amended specifications and drawings :—

(A) The meaning of " capillary tube " in relation to the invention described and claimed has not been defined in the specification. Having regard to the state of the art and the 30 importance of this term in defining the invention, a more adequate explanation should be given.

(B) The word " preferably " page 2, line 13, is objectionable. If it is intended to include, within the scope of the invention, a form which comprised a tube which is not open at one end, then such a form should be fully described.

(c) To the best of my knowledge the invention is already patented in the Commonwealth for the reason that the invention forming the subject of the present application is already patented under Patent Serial No. 122,073 (12167/43) sealed 2nd January, 1947, class 49.1, by H. G. Martin.

5. Claims 1 to 3 of the cited specification are in fact claims to an instrument of the type in question in which the ink reservoir is constituted by a capillary tube.

10 Argument in rebuttal of the Examiner's objection or amendment with the view to the removal thereof may be submitted in writing for further reference to the Examiner. Every answer to the Examiner's objection will be officially regarded as a request for a further report by the Examiner unless a notification that the applicant desires to be heard by the Commissioner, in accordance with the provisions of Sec. 119 of the Act, is lodged at the Patent Office.

A. A. STIRLING,
Chief Examiner of Patents.

20 Messrs. Phillips, Ormonde, Le Plastrier & Kelson,
37-41 Queen Street,
Melbourne, Vic.

Particular attention is drawn to Sections 42, 45, 46, and 119 of the Patents Act 1903-1946 and Regulations 61 to 63 inclusive of the Patents Regulations 1912 printed on the back hereof.

As proceedings under the Patents Act 1903-1946 and Patents Regulations 1912 are subject to limitations of time, attention is also drawn to the provisions of Sections 38 and 48 of the Patents Act 1903-1946 and Regulations 14 of the Patents Regulations 1912, also printed on the back hereof.

30 Amendments proposed by way of answer to Examiner's Reports must be presented on sheets of paper separate from correspondence and the documents.

Proposed amendments to the drawings must be shown so as to clearly set out the proposed amendment.

Exhibits.

6.
Letter from
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
26th
August
1947,
continued.

*Exhibits.***EXHIBITS.**

6.
Letter from
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
11th March
1948.

Exhibit " 6 "—Letter from Patent Office to the Plaintiff's Patent Attorneys.

Letter Form No. 41 (a).

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF PATENTS.

Patent Office.
Canberra, A.C.T. 11th Mar. 1948.

Gentlemen,

Application No. 12499/43 HENRY GEORGE MARTIN.

With reference to your Application for a patent numbered as above, 10
I have to inform you that the examiner has further reported thereon as follows :—

In further response to official letter of 26th August, 1947, the attorneys with a letter dated 28th January, 1948, lodged on 30th January, 1948, a statement of proposed amendments and argument in rebuttal to the objections taken.

2. Proposed amendments 1, 3 and 5 will remove the objection communicated in paragraph 3 of the official letter.

3. Proposed amendments 2 and 4 are not acceptable. The new claim is directed to an instrument characterised by a specific result. This 20
feature was nowhere suggested in the specification originally filed. Even if it could be regarded as envisaged by that document, then on the same basis, it is a result and which is an essential characteristic of the claims of the prior Patent, and accordingly the objection under Section 41A still obtains. It is noted that no details, as to the manner in which the result is to be attained, have been given.

4. The remarks on page 2, paragraph 1, of the attorneys' letter are not agreed with. Such an interpretation is nowhere obtainable from the original specification, whereas the contrary is plainly stated throughout 30

5. It is difficult to understand precisely what is the import of page 1, paragraph 3, of the attorneys' letter, but the cited specification is, in fact, a prior Patent. In this regard, a fuller statement of reasons would be helpful.

The time for acceptance has been extended to 13.6.48 and the time for sealing has been extended to 13.10.48, under the provisions of Section 9 of the Patents, Trade Marks, Designs and Copyright (War Powers) Act 1939-40.

Argument in rebuttal of the Examiner's objection or amendment with the view to the removal thereof may be submitted in writing for further reference to the Examiner. Every answer to the Examiner's objection will be officially regarded as a request for a further report by the Examiner unless a notification that the applicant desires to be heard by the Commissioner, in accordance with the provisions of Sec. 119 of the Act, is lodged at the Patent Office.

Messrs. Phillips, Ormonde,
Le Plastrier & Kelson,
10 37-41 Queen Street,
Melbourne, Vic.

H. DAVIES,
Assistant Chief Examiner.

Exhibits.
6.
Letter from
Patent
Office to
the
Plaintiff's
Attorneys,
11th March
1948,
continued.

Particular attention is drawn to Sections 42, 45, 46, and 119 of the Patents Act 1903-1946 and Regulations 61 to 63 inclusive of the Patents Regulations 1912 printed on the back hereof.

As proceedings under the Patents Act 1903-1946 and Patents Regulations 1912 are subject to limitations of time, attention is also drawn to the provisions of Sections 38 and 48 of the Patents Act 1903-1946 and Regulation 14 of the Patents Regulations 1912, also printed on the back hereof.

Amendments proposed by way of answer to Examiner's Reports
20 must be presented on sheets of paper separate from correspondence documents.

Proposed amendments to the drawings must be shown so as to clearly set out the proposed amendment.

*Exhibits.***EXHIBITS.**

6.
Letter from
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
24th
December
1948.

Exhibit " 6 "—Letter from Patent Office to the Plaintiff's Patent Attorneys.

Letter Form No. 1 (a)

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF PATENTS.

Patent Office,
Canberra, A.C.T.

24th Dec. 1948.

Gentlemen,

Application No. 12499/43 HENRY GEORGE MARTIN.

10

With reference to your Application for a patent numbered as above, I have to inform you that the examiner has further reported thereon as follows :—

In response to official letter dated 11th March, 1948 the attorneys with letter dated 16th November, 1948 lodged a statement of proposed amendments to the " Amended " Specification and Drawings lodged 18th December, 1946.

2. Whilst the proposed amendments will remove the objections communicated, consequential objections obtain for the following reasons :—

(1) The specification as proposed to be amended does not fully describe and ascertain the Invention and the manner in which it is to be performed for the reason that apart from the reference in the preamble that a specific feature of the Invention is a restricted feed duct, nowhere in the description has this feature been fully described in relation with the figures or referred to in conjunction with a reference indicating such part on a drawing. 20

(2) The statement of the Invention claimed is not a distinct statement for the reason that proposed amended claim 1 :—

(A) includes a restricted feed duct between the capillary reservoir and the ball which feature has not been fully described in the specification. (B) The said restricted feed duct was not claimed in the original specification lodged with the application ; or ascertained or described therein as constituting a feature of the Invention. 30

The time for acceptance has been extended to 13.3.49, and the time for sealing has been extended to 13.7.49, under the provisions of Section 9 of the Patents, Trade Marks, Designs and Copyright (War Powers) Act 1939-1940.

Argument in rebuttal of the Examiner's objection or amendment with the view of the removal thereof may be submitted in writing for further reference to the Examiner. Every answer to the Examiner's objection will be officially regarded as a request for a further report by the Examiner unless a notification that the applicant desires to be heard by the Commissioner, in accordance with the provisions of Sec. 119 of the Act, is lodged at the Patent Office.

Exhibits.
 ———
 Letter from
 Patent
 Office to
 the
 Plaintiff's
 Patent
 Attorneys,
 24th
 December
 1948.
continued.

10 Messrs. Phillips, Ormonde,
 Le Plastrier & Kelson,
 37-41 Queen Street,
 Melbourne, C.1, Vic.

T. LEAPER,
 Asst. Chief Examiner.

Particular attention is drawn to Sections 42, 45, 46, and 119 of the Patents Act 1903-1946 and regulations 61 to 63 inclusive of the Patents Regulations 1912 printed on the back hereof.

As proceedings under the Patents Act 1903-1946 and Patents Regulations 1912 are subject to limitations of time, attention is also drawn to the provisions of Sections 38 and 48 of the Patents Act 1903-1946 and Regulation 14 of the Patents Regulations 1912, also printed on the back hereof.

20 Amendments proposed by way of answer to Examiner's Reports must be presented on sheets of paper separate from correspondence and the documents.

Proposed amendments to the drawings must be shown so as to clearly set out the proposed amendment.

*Exhibits.***EXHIBITS.**

6.
 Letter from
 Patent
 Office to
 the
 Plaintiff's
 Patent
 Attorneys,
 27th April
 1949.

Exhibit " 6 "—Letter from Patent Office to the Plaintiff's Patent Attorneys.

Letter Form No. 41 (A).

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF PATENTS.

Patent Office,
 Canberra, A.C.T.

27th Apr. 1949.

Gentlemen,

Application No. 12499/43 HENRY GEORGE MARTIN

10

With reference to your application for a patent numbered as above, I have to inform you that the examiner has further reported thereon as follows :—

In response to official letter 24th December, 1948, the attorney with letters dated 10th and 11th March, 1949 lodged on 14th March, 1949, amendment items 19 to 25 which will overcome objections to the description and claims.

2. Objection still obtains for the reasons that :—

(A) Figure 1 is described as being an embodiment of the Invention, but does not include a restricted feed duct—the essential feature of the Invention, and 20

(B) The statement of the invention claimed is not a distinct statement for the reason that claim 9 is directed to all the figures of the drawings including Figure 1 of the drawings which figure does not include or show the restricted feed duct—the essential feature of the Invention. The time for acceptance has been extended to 13-6-49 and the time for sealing has been extended to 13-10-49 under the provisions of Section 9 of the Patents, Trade Marks, Designs and Copyright (War Powers) Act 1939-1940.

Argument in rebuttal of the Examiner's objection or amendment with the view to the removal thereof may be submitted in writing for further reference to the Examiner. Every answer to the Examiner's objection will be officially regarded as a request for a further report by the Examiner 30

unless a notification that the applicant desires to be heard by the Commissioner, in accordance with the provisions of Sec. 119 of the Act, is lodged at the Patent Office.

Messrs. Phillips, Ormonde,
Le Plastrier & Kelson,
37-41 Queen Street,
Melbourne C.1, VIC.

T. LEAPER,
Asst. Chief Examiner.

Exhibits.

6.

Letter from
Patent
Office to
the
Plaintiff's
Patent
Attorneys,
27th April
1949.

continued.

Particular attention is drawn to Sections 42, 45, 46, and 119 of the
10 Patents Act 1903-1946 and Regulations 61 to 63 inclusive of the Patents
Regulations 1912 printed on the back hereof.

As proceedings under the Patents Act 1903-1946 and Patents
Regulations 1912 are subject to limitations of time, attention is also drawn
to the provisions of Sections 38 and 48 of the Patents Act 1903-1946 and
Regulations 14 of the Patents Regulations 1912, also printed on the back
hereof.

Amendments proposed by way of answer to Examiner's Reports
must be presented on sheets of paper separate from correspondence and
the documents.

20 Proposed amendments to the drawings must be shown so as to clearly
set out the proposed amendments.

EXHIBITS.

Exhibit " 7 "—Piece of Paper held vertically and written on by Dr. Fehling.

Exhibits.

7.

Piece of
paper held
vertically
and
written on
by Dr.
Fehling.

EXHIBITS.

Exhibit " 8 "—Piece of Paper written on by Dr. Fehling with pen held at an angle.

8.

Piece of
paper
written on
by Dr.
Fehling
with pen
held at
an angle.

320

Summer
Summer
Summer
Winter

See 925
Mudic on Sandal 1/14/44
See Shell 9
Ev

EXHIBIT 7.

Summer
Summer

See 927
Mudic on Sandal 1/14/44
See Shell 9
Ev

EXHIBITS.

Exhibit " I "—Examiner's Report (tendered by Defendant with Exhibit " 2 " but rejected).

Exhibits.

I.
Examiner's
Report,
23rd
August
1945.

3.64.

graduation, and the ³²⁴reference characters are not clearly shown.

The ^{references} drawings, especially figures 1, 2, 5, are not suitable for reproduction.

Paragraph 5.

5. In the reason that the invention is already the subject of application No 12167⁴³, Class 49.1, by same applicant, [as in this case] lodged 8th Dec. 1940. This objection is based upon Claim 1. When the claim of the cited case is considered in relation to figure 6 thereof, it is clear that the subject of claim 1 of the present application is claimed. [Application No 12161⁴³ is not open to public inspection].

- Note:
- (a) a True Copy Specification has not been lodged
 - (b) True Copy Drawings were not lodged with the application.
True Copy Drawings were lodged on the 10th October, 1941, and will meet official requirements.
 - (c) In the cited application No 12167⁴³ Figure 3a is shown on the drawings, but is not specifically referred to in the specification, and action has been suggested by the Attorney to delete it.
This figure shows the subject matter of the present application, and while it remains as part of the application, supports the objection of prior application cited above in respect to Fig. 6 of that application.
 - (d) Extension of time for acceptance is necessary.

[Signature]

Temp. Exam. Pat. File 1.

The Commissioner of Patents

[Signature]
8/2/45

EXHIBITS.

Exhibit " I "—Examiner's further Report (tendered by Defendant with Exhibit " 2 " but rejected).

Exhibits.

I.
Examiner's
further
Report,
30th June
1947.

PATENTS ACT 1903-1946.

Examiner's Further Report.

Application No. 12499 of 1943

Application.

~~Provisional Specification.~~

Complete Specification.

Date of Application. 31st Dec, 1943.

~~Grant Specification.~~

This—

In response to official letters of 19th October, 1945 and 2nd Dec. 1946, the attorney with letter dated 18th December, 1946. Lodge on 18th Dec. 1946. Amended specification & drawings. These lodgements are not adequate to remove all the objections communicated.

(In reply.)

The attorney in letter dated 18th Dec. 1946 requests the withdrawal of the objection to the title. In view of the submission of amended claims, this objection to title is withdrawn.

No submissions have been made in respect to the objection of paragraph 2 of the official letter of 19th October 1945 regarding the air in the manner in which the relevant duct communicates with the atmosphere must be clearly illustrated in respect of all embodiments.

Further, the following objections obtain in respect of the amended specifications and drawings:— (a) the meaning of "capillary tube" in relation to the invention described and claimed has not been defined in the specification. Having regard to the state of the art and the importance of this term in defining the invention

Ch. No. 50.

REPORT APPROVED.

[Handwritten signatures and dates]
5/7/1947
Chief Examiner.

est. a more adequate explanation should be given.

Patent Office Form 1 B (c).

(b) The word "preferably" page 2 line 13, is objectionable. If it is intended to include, within the scope of the invention, a form which comprises a tube which is not open at one end, then such a form should be fully described.

(c) To the best of my knowledge the invention is already patented in the Commonwealth (Section 41a) for the reason that the invention forming the subject of the present application is already patented under Patent Serial No 122, 073 (12167/43) sealed 2nd Jan 1947 Class 49.1 by H. G. Martin (Argentina).
Claims 1 to 3 of the cited specification ^{is} in fact a claim to an instrument of the type in question in which the ink reservoir is constituted by a capillary tube.

H. G. Martin
Temp. Exam. Pat. Sec. 1.
30. 6. 47

THE COMMISSIONER OF PATENTS.

G. H. Rawlins
Examiner of Patents.
X 7 1947

DIRECTION

Deputy Commissioner of Patents.

NOTE 1. Reasons in support of negative findings must be numbered to correspond with the objections to which they relate.
2. Where opinions of an extra statutory nature are furnished for the information of the Commissioner they should be set out in a separate statement.

EXHIBITS.

Exhibit " I "—Examiner's further Report (tendered by Defendant with Exhibit " 2 " but rejected).

Exhibits.

I.
Examiner's
further
Report,
10th
February
1948.

Examiner's Further Report.

Application No. 12499 of 1947

Application.

~~Provisional Specification.~~

Complete Specification.

Date of Application. 31st Dec, 1947.

~~Gen. P. Specification.~~

Time—

In response to official letter of 26th August 1947 the attorneys with letter dated 28th Jan. 1948, lodged on 30th Jan. 1948 a statement of proposed amendments and argument in rebuttal to objections taken.

In reply.

Proposed amendments 1, 3 & 5 will remove the objection communicated in para 3 of official letter.

Proposed amendments 2 and 4 are not acceptable. The new claim is directed to an instrument characterised by a specific result. This feature was nowhere suggested in the specification originally filed. Even if it could be regarded as envisaged by that document, then on the same basis it is a result which is an essential characteristic of the claims of the prior Patent, and accordingly the objection under Sec. 41(a) still obtains. [Incidentally] It is noted that no details as to the manner in which the result is to be attained, have been given.

The remarks on page 2, para. 1 of the attorneys' letter are not agreed with. *Att. No. 10 2. 48.*

REPORT APPROVED.

W. J. Davis

W. J. Davis
Acting Chief Examiner.

20 / 2 / 19 48

Such an interpretation is nowhere obtainable from the original specification, whereas the contrary is plainly stated throughout that document.

It is difficult to understand precisely what is the import of page 1, para. 3, of the attorneys letter; the cited specification is in fact a prior patent. In this regard a fuller statement of reasons would be helpful.

Note 1. a further extension of time for acceptance is necessary. In this regard see the submission contained in the last four paras. of the attorneys letter dated 20/12/1948

Note 2. The "amended" original drawings - Figs 1 & 2 are not within this file.

H. Warner
Tech. Exam. Pat. Office
10. 2. 48.

THE COMMISSIONER OF PATENTS.

J. A. Brown/nd
Examiner of Patents.
19 2 1948

DIRECTION

Deputy Commissioner of Patents.

9 FEB 1948

Note.—1. Reasons in support of negative findings must be numbered to correspond with the objections to which they relate.
2. Where opinions of an extra statutory nature are furnished for the information of the Commissioner they should be set out in a separate statement.

EXHIBITS.

Exhibit " I "—Examiner's further Report (tendered by Defendant with Exhibit " 2 " but rejected).

Exhibits.

I.
Examiner's
further
Report,
25th
November
1948.

PATENTS ACT 1903-1946.

Examiner's Further Report.

Application No. 12499 of 1943

Date of Application. 31st Dec., 1943.

~~Application~~

~~Provisional Specification.~~

Complete Specification.

~~C.A.P. Specification.~~

Time

In response to official letter dated 11th March 1948 the attorney, with letter dated 16th November 1948, lodged ^{on 17/11/48} a statement of proposed amendments to the "Amended" Specification and Drawings lodged 15th Dec 1946.

whilst the proposed amendments will remove the objections communicated, consequential objections obtain for the following reasons:-

- (i) the Specification as proposed to be amended does not fully describe and ascertain the Invention and the manner in which it is to be performed for the reason that apart from the reference in the preamble that the specific feature of the Invention is a restricted feed duct, nowhere in the description has the

6th Mar 25/1948

REPORT APPROVED.

Superintendent
Chief Examiner.
29/11/1948

feature been fully described in relation with the figures or even referred to in conjunction with a reference indicating such part on the Drawing.

(ii) The statement of the Invention claimed is not a distinct statement for the reason that proposed "Amended Claim 1

(a) includes a restricted feed duct between the capillary reservoir and the ball, which feature has not been fully described in the Specification.

(b) ^{as was} includes a restricted feed duct ^{not} previously claimed ⁱⁿ the "original" specification lodged with the application; or ascertained or described therein as constituting a feature of the Invention.

Note Extension of time for acceptance has been granted to 13th Dec, 1948.

Hurman
Temp Exa. Pat. Act.
25/11/48.

THE COMMISSIONER OF PATENTS.

J. M. Hurman
Examiner of Patents.
29 11 19 48

DIRECTION

Deputy Commissioner of Patents.

19

ETC

NOTE.—1. Reasons in support of negative findings must be numbered to correspond with the objections to which they relate.

2. Where opinions of a purely statutory nature are furnished for the information of the Commissioner they should be set out in a separate statement.

2000-4/48-5000.

EXHIBITS.

Exhibit " I "—Examiner's further Report (tendered by Defendant with Exhibit " 2 " but rejected).

Exhibits.

I.
Examiner's
further
Report,
28th
March
1949.

PATENTS ACT 1903-1946.

Examiner's Further Report.

Application No. 12499 of 1943

Date of Application. 31st Dec., 1943.

~~Application~~
~~Provisional Specification~~
Complete Specification.
~~Gr.P. Specification~~

Time

In response to Official Letters (26th Aug., 1947 and) 24th Dec., 1948; the attorney with letters dated 10th and 11th March 1949, lodged on 14th March 1949, amendment Items 19 to 25 which will overcome objections to the description and claims. (with respect to Figures 2 to 6.)

REPORT APPROVED.

Objection 4(b) of Official letter 26/8/47 is overcome by Amendment Item 6, lodged 18th Nov., 1948, by omission of objection 4(a) of Official letter 26/8/47 is overcome by Amend. Item 25 lodged 14th March, 1949, in which the size of capillary tube is specifically described. Objection 1 of Official letter 24th Dec. 1948 is overcome by Amendment Items. 19, 21, 22, 23, 24, and 25 by which the restricted duct is adequately described.

Objection 2 of Official letter 24th Dec 1948 is overcome by amendment Items 20 and 22; by the addition of pertinent descriptions and additional claims. The proposed amended Drawings, lodged 18th Dec. 1946 will overcome the objection to the informal Amended Drawings, lodged 10th Oct., 1944; and the Amended Drawings are in accordance with those originally lodged.

Aty. No. 25/3/49

Informal & as over.
[Signature]

Chief Examiner.
21 / 3 / 1949

The proposed Amendments to the Claims (Item 10 as amended by Item 20) will overcome the objection of prior patenting communicated in Official letter 26th Aug, 1947. The proposed Amended Claim 1 includes as the essential feature, a restricted feed duct from reservoir to ball, which feature is not claimed in the cited Patent 122,073.

Objection still obtains for the reason that -

- (a) Figure 1 is described as being an embodiment of the Invention, but does not include a restricted feed duct - the essential feature of the Invention, and
- (b) The statement of the Invention claimed is not a distinct statement for the reason that Claim 9 is directed to all the figures of the Drawings, including Fig. 1. of the drawings - which figure does not include or show the restricted feed duct - the essential feature of the Invention.

Note: Further extension of time for acceptance is necessary.

Harcourt
Rep. Exam. Pat. 25. 3. 49.

THE COMMISSIONER OF PATENTS.

J. M. Newman
Examiner of Patents. No 2
29 / 3 / 1949

DIRECTION

Deputy Commissioner of Patents.

/ / 19

Handwritten notes:
The claim of this amendment is not a new claim.
29/3/49

NOTE - 1. Reasons in support of negative findings must be numbered to correspond with the objections to which they relate.
2. Where reasons of an extra statutory nature are furnished for the information of the Commissioner they should be set out in a separate statement.

EXHIBITS.

Exhibit " I "—Examiner's further Report (tendered by Defendant with Exhibit " 2 " but rejected).

Exhibits.

I.
Examiner's
further
Report,
30th May
1949.

PATENTS ACT 1903-1946.

133163

Examiner's Further Report.

Application No. 12499 of 1943

Date of Application 31st Dec., 1943.

Application
~~Provisional Specification~~
Complete Specification.
~~Graph Specification~~

Time--

In response to Official Letter 27th April 1949 the attorneys with letter dated 16th May 1949 lodged on 18th May 1949, a statement of proposed Amendments, which will, by correction, remove the objections communicated.

There are now no outstanding objections.

The Amendments to be incorporated in the documents, subject to allowance, are as follows in the Specification -

- (1) Amended Specification pages 2 to 8 inclusive as lodged 18th Dec., 1946; -
as amended by -
- (a) Items 6 to 17 inclusive lodged 16th November 1948
- (b) Amendment of Item 6 lodged 18th November 1948 as per Item 25 lodged 14th March 1949.

etc. etc. 20/5/49

REPORT APPROVED.

NO COPY TO BE MADE

[Signature]
ASSISTANT EXAMINER

Chief Examiner.
10/12/49

- (c) Amendment of Item 10 as per Item 20 lodged 14th March 1949.
- (d) Amendment Items 19, 21, 22 and 23 lodged 14th March 1949.
- (e) Amendment Item 26 lodged 18th May 1949.

Into Drawings -

- (2) Amended Drawings lodged 18th Dec., 1946; as amended by -
 - (a) Amendment to Figure 3 of the Drawings as per Item 5 lodged 30th Jan. 1948 as issued in accordance with Attorney's letter lodged 18.11.48
 - (b) Cancellation of Figures 7 and 8 of Amended Drawings lodged 18th Dec. 1946 as per Item 15 lodged 18th Nov. 1946
 - (c) Amendment of Figures 2, 3, and 6 of Amended Drawings lodged 18th Dec., 1946 as per Item 24 lodged 14th March. 1949.
 - (d) Amendment to Figure 1 of Amended Drawings lodged 18th Dec. 1946 as per Item 27 lodged 18th May. 1949.
- Note: The amendments to the Drawings are not of a structural nature.
Note: Extension of time for acceptance has been granted to 13th June 1949.

J. H. Thompson
Deputy Commissioner of Patents.
30.5.49.

THE COMMISSIONER OF PATENTS.

J. H. Thompson
Examiner of Patents.
7 10 19 49

DIRECTION

13.6.49.

Amended Application: 10-246 (2-25)
 Amended Drawings: 18-12-46
 Amended Items: 18-11-48 (6-18)
 Amended Items: 19-3-49 (19-25): 19-5-49 (26-27)

AMENDMENTS MADE

Deputy Commissioner of Patents.

17/6/49

1. Reasons in support of negative findings must be numbered to correspond with the objections to which they relate.
 2. Where opinions of an examining officer are furnished for the information of the Commissioner they should be set out in a separate statement.
 GPO - 32/48 - 30,000.

14/6/49

Photo Copy Fig. 3.

Drawings amended

571

Amended Drawings to be amended

17/6/49

EXHIBITS.

Exhibits.

Exhibit " II "—Letter from Plaintiff's Patent Attorneys to the Patent Office (tendered by Defendant with Exhibit " 6 " but rejected).

Provident Life Building,
37-41 Queen Street,
Melbourne, C.1.

18th December, 1946.

II.
Letter from
Plaintiff's
Patent
Attorneys
to the
Patent
Office,
18th
December
1946.

The Commissioner of Patents,
Commonwealth of Australia.

10 IN THE MATTER of Application No. 12,499 filed 31 December,
1943 in the name of HENRY GEORGE MARTIN.

Sir,

We refer to the Examiner's original report as embodied in official letter of 19th October, 1945, and also to the further report as quoted in official letter dated 2nd December, 1946. Reference is also made to official letter of 5th December, 1946, intimating that the time for acceptance and for sealing has been extended to 13th September, 1947, and the 13th January, 1948, respectively, under the provisions of Regulation 14 (2) (d).

20 As to the objection raised against the title, it is pointed out that the subject matter of the application is not a fountain pen such as usually described by that term, but is a writing instrument of a particular type, namely one with a writing element in the form of a rotary ball. It is believed that the present title does sufficiently indicate the subject matter of the invention, and it is, therefore, requested that the objection may be reviewed and withdrawn. As to the other matters raised by the Examiner, it is proposed to remove them by a fresh description, statement of claim and new drawings all of which are submitted herewith. GS : DH.

It is requested that the three sheets of true drawings may be officially prepared.

30 We are remitting this day the acceptance fee and the sum of three shillings in respect of the cost of the true copy drawings.

Respectfully,

HENRY GEORGE MARTIN

By his Patent Attorneys :—

Enc. : Substitute description in duplicate
Substitute statement of claim in duplicate
Original drawings (sheets 3)
Acceptance fee
Cost of true copy drawing (3/-).

*Exhibits.***EXHIBITS.**

II.
Letter
from
Plaintiff's
Patent
Attorneys
to the
Patent
Office,
28th
January
1948.

Exhibit " II "—Letter from Plaintiff's Patent Attorneys to the Patent Office (tendered by Defendant with Exhibit " 6 " but rejected).

Provident Life Building,
37-41 Queen Street,
Melbourne, C.1.

28th January, 1948.

THE COMMISSIONER OF PATENTS,
Commonwealth of Australia.

IN THE MATTER of Application No. 12,499, filed 31st December, 10
1943, in the name of HENRY GEORGE MARTIN.

Sir,

We refer to official letter, dated the 26th August, 1947, advising of a further report from the Examiner, and submit herewith proposed amendments which it is believed will overcome all official objections and enable the application to go forward to acceptance.

Referring to objection 4 (A), the expression " capillary tube " is a scientific expression and will be found adequately defined in any standard scientific dictionary or encyclopedia. In any event, it is now proposed to replace original Claim 1 by a new Claim 1 in which reference is made to capillary action, as distinct from a capillary tube, while a similar consistency is proposed to be inserted in the opening part of the description. It is therefore considered that the objection in question will no longer apply. 20

As to Patent No. 122,073, it is pointed out that the present application was filed on the 31st December, 1943, and, at that date, which is the important date, a patent had not been sealed in connection with specification No. 122,073.

Apart from that fact, the major question on this particular issue is as to whether there is any conflict or overlapping between the claims of the respective specifications. One feature of the claims of specification No. 122,073 is that the conduit or conduits follow " an extended path," whereas, according to the present invention, it would be in order to employ an appropriate conduit or tube of, say, 6 mm. in length and this could not be said to fall within the definition of " an extended path." 30

It is requested that the Examiner may be good enough to reconsider and withdraw his objections in the light of the foregoing. If it is deemed necessary, the applicant would be prepared to include in the present specification, a specific reference to patent No. 122,073.

It is also requested that an appropriate extension of the acceptance period may be granted under the provisions of the War Powers Act 1939-46, 40 having regard to the delays in prosecution which have occurred and which

have not been due to any default on the part of the applicant or his Attorneys. Thus, the application was filed on the 31st December, 1943. The first report of the Examiner is dated the 19th October, 1945, and, amongst other things, refers to a citation which was then not open to inspection. A second report from the Examiner was dated the 2nd December, 1946, and disclosed the number of the citation which had then become open to inspection. In view of such delay, the acceptance period was extended to the 13th September, 1947, by operation of Regulation 14 (2) (d).

Exhibits.

II.

Letter
from
Plaintiff's
Patent
Attorneys
to the
Patent
Office,
28th
January
1948,
continued.

- 10 In reply to the second report of the Examiner, a proposed substitute specification was filed under cover of a letter dated the 18th December, 1946, and appears to have been received at the Patent Office on that date.

A third report of the Examiner was not issued until the 26th August, 1947, and had to be referred to the instructing Attorneys in the United Kingdom.

It will be seen that more than eight months elapsed between the filing of the proposed substitute specification and the issue of the third report of the Examiner but, up to the present, no extension of the acceptance period appears to have been granted under the provisions of the War Powers Act.

20

Respectfully,

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

Hwth : amendments.

*Exhibits.***EXHIBITS.**

II.

Letter
from
Plaintiff's
Patent
Attorneys
to the
Patent
Office,
16th
November
1948.

Exhibit " II "—Letter from Plaintiff's Patent Attorneys to the Patent Office (tendered by Defendant with Exhibit " 6 " but rejected).

Provident Life Building,
37-41 Queen Street,
Melbourne, C.1.

16th November, 1948.

THE COMMISSIONER OF PATENTS,
Commonwealth of Australia.

IN THE MATTER of Application No. 12,499, filed 31st December, 10
1943, in the name of HENRY GEORGE MARTIN.

Sir,

We refer to official letter, dated the 11th March, 1948, quoting a further report from the Examiner.

In view thereof, the case has been fully reviewed and it is requested that the proposed amendments, dated 28th January, 1948, may be cancelled, with the exception of Item No. 5, and that the latter may be adjusted so that it is applicable only to Figure 3 of the drawings, it being now proposed to cancel Figures 7 and 8 of the drawings.

It is desired to replace the original proposed amendments by the new proposals submitted herewith and which, it is believed, will avoid all of the Examiner's objections and enable the complete specification to be accepted. 20

The period for acceptance has already been extended to the 13th June, 1948, by operation of Section 9 of the War Powers Act 1939-40 and we lodge herewith a request for a further six months' extension of that period under the provisions of Regulation 14 (1) and remit the prescribed fee herewith.

Having regard to the urgency of the case, it is requested that the matter may receive immediate attention. 30

Respectfully,

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

Hwth : amendments ;
extn. appln ;
fee—£6.0.0.

OS/MS

EXHIBITS.

Exhibits.

Exhibit " II "—Letter from Plaintiff's Patent Attorneys to the Patent Office (tendered by Defendant with Exhibit " 6 " but rejected).

II.

Letter from Plaintiff's Patent Attorneys to the Patent Office, 10th March 1949.

Provident Life Building,
37-41 Queen Street,
Melbourne, C.I.

10th March, 1949.

THE COMMISSIONER OF PATENTS,
Commonwealth of Australia.

10 IN THE MATTER of Application No. 12,499, filed 31st December, 1943, in the name of HENRY GEORGE MARTIN.

Sir,

We refer to official letter, dated the 24th December, 1948, advising of a further report from the Examiner.

In order to meet the consequential objections raised in paragraph 2 (1) (2) (a), we submit herewith supplemental amendments to those dated 16th November, 1948.

20 The remaining objection necessitates a consideration of the specification and drawings as originally filed. It is apparent from the description of the original specification that a clear line of distinction is drawn between the passage or channel constituting the reservoir on the one hand and the feed duct which leads from the reservoir to the ball. The very fact that such elements are given different terms throughout the description and also the claims indicates that they were always regarded as performing different functions, notwithstanding that the feed duct is in some places stated to be an extension of the reservoir.

The Examiner's attention is drawn in particular to the opening passage of the second paragraph on Page 1a, which reads (the underlinings being ours) :—

30 " In fact, the extension of the feed channel for constituting the reservoir by means of a duct of small section . . . "

It is clear that, by referring to the duct as being of " small section," means that it is of small section in relation to the feed channel constituting the reservoir as that is the only point of comparison.

40 The fact that such feed duct, or at least that portion thereof adjacent the writing ball, was always intended to be of relatively small cross section in relation to the reservoir channel, will also be apparent from Figures 2; 3 and 6 of the drawings, in each of which what may be termed the leading portion of the feed duct is shown considerably smaller than the channel which constitutes the reservoir.

Exhibits.

II.
 Letter
 from
 Plaintiff's
 Patent
 Attorneys
 to the
 Patent
 Office,
 10th March
 1949,
continued.

Having regard to the foregoing, we believe that the Examiner will agree that, although the restricted feed duct was not specifically claimed in the original specification, it was at least ascertained or described and also illustrated as being a feature of the invention.

It is also pointed out that the original specification is a rather literal translation from the Spanish and, hence, due allowance should be made, if necessary, although this is not believed to be so, for matters which are probably not so clearly expressed as would have been the case if the specification was originally prepared in the English language.

The time for acceptance of this application has been extended to the 10 13th March, 1949, by operation of Section 9 of the War Powers Act 1939-40 and it is therefore requested that the matter may be given urgent and favourable consideration.

Respectfully,

HENRY GEORGE MARTIN,

By his Patent Attorneys :—

Hwth : amendments

GS/MS

EXHIBITS.

Exhibits.

Exhibit " II "—Letter from Plaintiff's Patent Attorneys to the Patent Office (tendered by Defendant with Exhibit " 6 " but rejected).

Provident Life Building,
37-41 Queen Street,
Melbourne, C.I.

11th March, 1949.

II.
Letter
from
Plaintiff's
Patent
Attorneys
to the
Patent
Office,
11th March
1949.

THE COMMISSIONER OF PATENTS,
Commonwealth of Australia.

10 IN THE MATTER of Application No. 12,499, filed 31st December,
 1943, in the name of HENRY GEORGE MARTIN.

Sir,

Further to our letter of yesterday's date, in relation to the Examiner's report of the 24th December, 1948, it now appears that a further supplemental amendment is desirable in order more particularly to explain and define the invention. The point at issue relates to the term " capillary " as applied to the tube constituting the reservoir. In view of various definitions of " capillary " to be found in Encyclopaedia, technical publications and dictionaries, it seems desirable that, in order to avoid
20 any possibility of ambiguity, the relevant portion of Item 6 of the proposed amendments, dated 16th November, 1948, should be somewhat more specific.

It is therefore requested that the Examiner will give due attention to the further supplemental amendment annexed hereto.

Respectfully,

HENRY GEORGE MARTIN,
By his Patent Attorneys :—

Hwth : amendment.

*Exhibits.***EXHIBITS.**

II.

Letter
from
Plaintiff's
Patent
Attorneys
to the
Patent
Office,
16th May
1949.

Exhibit " II "—Letter from Plaintiff's Patent Attorneys to the Patent Office (tendered by Defendant with Exhibit " 6 " but rejected).

Provident Life Building,
37-41 Queen Street,
Melbourne, C.I.

16th May, 1949.

THE COMMISSIONER OF PATENTS,
Commonwealth of Australia.

IN THE MATTER of Application No. 12,499, filed 31st December, 10
1943, in the name of HENRY GEORGE MARTIN.

Sir,

We refer to official letter, dated the 27th April, 1949, advising of a further report from the Examiner, and submit herewith a supplemental amendment which we believe will remove the outstanding objections.

Early and favourable consideration is respectfully requested.

We take this opportunity of remitting the sealing fee.

Respectfully,

HENRY GEORGE MARTIN,

By his Patent Attorneys :— 20

GS/MS

Hwth : amendments.
fee—£5.0.0.

In the Privy Council.

ON APPEAL
FROM THE HIGH COURT OF AUSTRALIA

BETWEEN
HENRY GEORGE MARTIN (Plaintiff) *Appellant*
AND
SCRIBAL PROPRIETARY LIMITED (Defendant) *Respondent.*

RECORD OF PROCEEDINGS
(IN TWO VOLUMES)

VOLUME II
EXHIBITS
(Pages 231-352)

PAYNE, HICKS BEACH & CO.,
10 NEW SQUARE,
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Solicitors for the Appellant.

HAMILTON-HILL & PARTNER,
52 HAYMARKET,
LONDON, S.W.1,
Solicitors for the Respondent.