

- 3 In this diagram a section of the whetstone is illustrated with central hole 53, a central portion 52a and an effective whetstone circular portion 52b. In use the effective whetstone circular portion 52 contacts a surface for polishing or grinding that surface until the effective whetstone circular portion is worn away by abrasion down to the line marked Z in the diagram above. The remaining whetstone is then disposed of and replaced.
- 4 The present invention involves varying the thickness of the whetstone across its diameter as is illustrated in the following diagram:

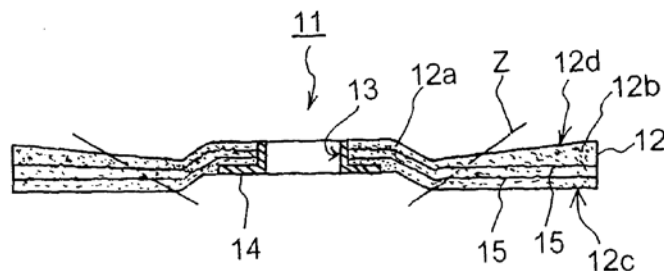


FIG. 2

- 5 In particular the central portion 12a is thinner than the effective whetstone circular portion 12b. The thickness gradually increases from the centre towards the edge of the disk. This extends the life of the whetstone by increasing the work it can do before it is worn away to the line Z. It also increases the effective contact area between the whetstone and the surface being polished as it is worn away. Moreover as the central portion is thinner less material is disposed of as waste.
- 6 Claims 1 and 8 are the only independent claims except for the omnibus claims and read, in their latest form filed on 22 April 2013, as follows:

1. A method of manufacturing a revolving whetstone comprising a disk-shaped whetstone body having a central portion which is not normally used for polishing work and an effective whetstone circular portion usable for carrying out polishing work formed as one body with the central portion, the central portion being a portion in which a whetstone center hole into which a whetstone driving shaft of a grinder is inserted in use is arranged, and the effective whetstone circular portion being arranged circumferentially outside of the central portion,

wherein a reference whetstone body is defined having a reference central portion which is not normally used for polishing work formed in the same thickness as a reference effective whetstone circular portion usable for carrying out polishing work which is arranged circumferentially outside of the reference central portion, the reference whetstone body being formed with a reference amount of whetstone material, and having a reference whetstone diameter and a reference central portion diameter, the reference effective whetstone circular portion comprising substantially 40% of the reference amount of whetstone material and the reference central portion comprising substantially 60% of the reference amount of whetstone material in the reference whetstone body,

the method including filling an abrasive grain and binder resin between two spaced molds and pressing the molds towards each other to form a said whetstone body with an amount of whetstone material corresponding to said reference amount of whetstone material and having a diameter equal to the reference whetstone diameter, wherein:

the wall thickness of the central portion of the said revolving whetstone is formed thinner than the wall thickness of the effective whetstone circular portion thereof, the central portion being

defined to have a diameter equal to the reference central portion diameter and being formed of an amount of whetstone material which is smaller by a first amount than an amount of whetstone material forming the reference central portion of the reference whetstone body formed of the same amount of whetstone material, such that the wall thickness of the central portion is thinner than the wall thickness of the reference central portion of the reference whetstone body, and the effective whetstone circular portion is formed of an amount of whetstone material which is larger by a second amount than an amount of whetstone material forming the reference effective whetstone circular portion of the reference whetstone body so as to be formed thicker than the wall thickness of the central portion, the first amount of whetstone material and the second amount of whetstone material being substantially equal.

8. A revolving whetstone comprising a disk-shaped whetstone body having a whetstone diameter, a central portion which is not normally used for polishing work and an effective whetstone circular portion usable for carrying out polishing work formed as one body with the central portion, the central portion being a portion in which a whetstone center hole into which a whetstone driving shaft of a grinder is inserted in use is arranged, and the effective whetstone circular portion being arranged circumferentially outside of the central portion,

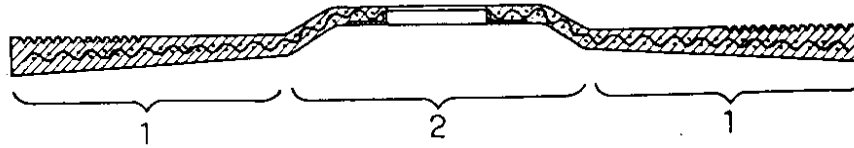
wherein a reference whetstone body formed of the same amount of whetstone material comprising a reference amount of whetstone material is defined having a reference whetstone diameter which is the same as the diameter of the said revolving whetstone, and a reference central portion which is not normally used for polishing work having a reference central portion diameter formed in the same thickness as a reference effective whetstone circular portion usable for carrying out polishing work which is arranged circumferentially outside of the reference central portion, the reference effective whetstone circular portion comprising substantially 40% of the reference amount of whetstone material and the reference central portion comprising substantially 60% of the reference amount of whetstone material in the reference whetstone body,

wherein: if the diameter of the central portion of said revolving whetstone is defined as a diameter equal to the reference central portion diameter, the wall thickness of the central portion of the said revolving whetstone is formed thinner than the wall thickness of the effective whetstone circular portion thereof, the central portion being formed of an amount of whetstone material which is smaller by a first amount than an amount of whetstone material forming the reference central portion of the reference whetstone body formed of the same amount of whetstone material, such that the wall thickness of the central portion is thinner than the wall thickness of the reference central portion of the reference whetstone body, and the effective whetstone circular portion is formed of an amount of whetstone material which is larger by a second amount than an amount of whetstone material forming the reference effective whetstone circular portion of the reference whetstone body so as to be formed thicker than the wall thickness of the central portion, the first amount of whetstone material and the second amount of whetstone material being substantially equal.

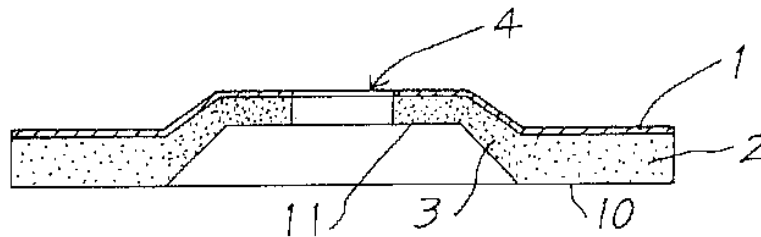
The prior art

- 7 The examiner cited four prior art documents in relation to her novelty and inventive step objections, listed below. I have included a relevant figure from each document which helps to illustrate the disclosure of each document.

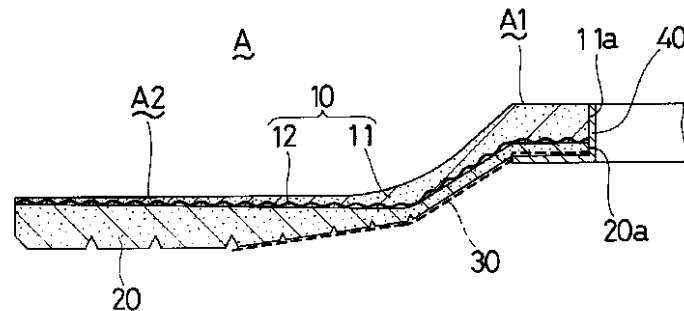
D1: JP 55103154 U (Figure)



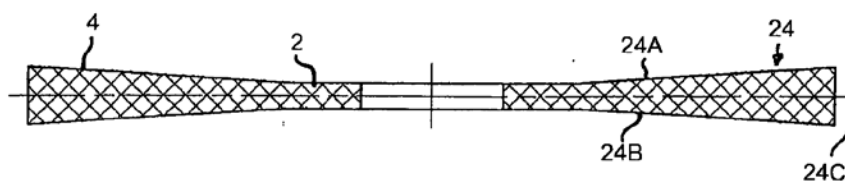
D2: JP 09234673 A (Figure 1)



D3: JP 07164328 A (Figure 2)



D4: DE 202006001154U U1 (Figure 6a)



- 8 As is illustrated in the figures above, D1-D4 all disclose grinding/polishing wheels which are non-uniform in thickness. Each wheel is thicker in its outer portion ("effective whetstone circular portion") than in its inner circular portion.

The law

Novelty and inventive step

- 9 Section 1(1) of the Patents Act 1977 ("the Act") states:

1.-(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –

(a) the invention is new;

(b) it involves an inventive step;

(c) it is capable of industrial application;

(d) the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A below;

and references in this Act to a patentable invention shall be construed accordingly.

10 Section 3 of the Act states:

3. An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).

11 In *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd*, [1985] RPC 49, the Court of Appeal formulated a four-step approach for assessing whether an invention is obvious to a person skilled in the art. This approach was restated and elaborated upon by the Court of Appeal in *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588 where Jacob LJ reformulated the *Windsurfing* approach as follows:

(1)(a) Identify the notional “person skilled in the art”.

(1)(b) Identify the common general knowledge of that person.

(2) Identify the inventive concept of the claim in question or if that cannot be readily done, construe it.

(3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or claim as construed.

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps that would have been obvious to the person skilled in the art or do they require any degree of invention?

12 In assessing whether the invention of present application involves an inventive step, I will therefore use this *Windsurfing/Pozzoli* approach.

Clarity and claim construction

13 Section 14(5) of the Act states:

(5) *The claim or claims shall –*

(a) ...

(b) *be clear and concise;*

...

14 Section 125(1) of the Act states:

125.-(1) For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.

15 A patent specification should be given a purposive construction. In *Kirin-Amgen Inc v Hoechst Marion Roussel Lrd* [2005] RPC 9 the House of Lords said that the question is always what the person skilled in the art would have understood the patentee to be using the language of the claim to mean.

Added subject matter

16 Section 76(2) of the Act states:

(2) No amendment of an application for a patent shall be allowed under section 15A(6), 18(3) or 19(1) if it results in the application disclosing matter extending beyond that disclosed in the application as filed.

17 In *Bonzel and Schneider (Europe) AG v Intervention Ltd* [1991] RPC 553 Aldous J described the task of determining whether an amendment to the description had the result that a patent as granted disclosed matter which extended beyond that disclosed in the application as:

(1) to ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application;

(2) to do the same in respect of the patent as granted;

(3) to compare the two disclosures and decide whether any subject matter relevant to the invention has been added whether by deletion or addition. The comparison is strict in the sense that subject matter will be added unless such matter is clearly and unambiguously disclosed in the application either explicitly or implicitly.

18 In *Richardson-Vicks Inc's Patent* [1995] RPC 568 Jacob J summarised this by saying: "the test of added matter is whether a skilled man would, upon looking at the amended specification, learn anything about the invention which he could not learn from the unamended specification."

Analysis

Added subject matter

- 19 The application as filed makes no explicit reference to a “reference whetstone body” at all, in particular to such a body with a “reference effective whetstone circular portion comprising substantially 40% of the reference amount of whetstone material and the reference central portion comprising substantially 60% of the reference amount of whetstone material in the reference whetstone body”.
- 20 It is apparent from the description as filed that a whetstone according to the invention is compared with a conventional whetstone. I am therefore satisfied that including a “reference whetstone body” in the claims which has an even thickness and the same diameter does not add subject matter to the description as filed.
- 21 What is less clear is whether the other features of the “reference whetstone body” added into claim 1 were present in the application as filed.
- 22 The applicant highlights in particular Figure 9, reproduced above, and the following section of paragraph [0007] of the application as filed to support the inclusion of the specific amount of material used for the central portion and effective whetstone circular portion of the reference whetstone:
- When the abrasion progresses to the position shown by a mark Z in FIG. 9 (approximately 40%) , it is judged that the revolving whetstone is out of its life time and is exchanged with a new revolving whetstone 51, and the old revolving whetstone 51 is disposed of as an industrial waste.
- 23 Figure 9 and paragraph [0007] relate to a description of a prior art conventional whetstone. Although the description does not explicitly link this prior art whetstone to the one used for the comparison with a whetstone made according to the claimed invention, the skilled reader would in my view make that link.
- 24 According to paragraph [0007] when abrasion of the conventional whetstone has progressed to the line Z in Figure 9 the whetstone is deemed to be at the end of its life and is disposed of. It is not however clear to what the “approximately 40%” refers in this paragraph. Firstly it is not clear whether the “40%” refers to a volume of material lost to abrasion, to a mass of material, to the diameter of the whetstone, or to something else. Nor is it clear whether the intended meaning is that 40% has been lost to abrasion or whether 40% remains. Moreover neither the figure of 40% nor the line marked “Z” in Figure 9 are used to define either the “effective whetstone circular portion” or the “central portion” of either the conventional whetstone or the whetstone made according to the invention (I considered whether this was implied in references to which parts of the whetstone were disposed of at the end of its life but concluded that there was not sufficient disclosure which linked the “effective whetstone circular portion” specifically to the portion disposed of and to the line marked “Z”).
- 25 I therefore agree with the examiner that specifying that the reference effective whetstone circular portion comprises substantially 40% of the reference amount of whetstone material and the reference central portion comprises substantially 60% of the reference amount of whetstone material in the reference whetstone body

constitutes added subject matter and I will exclude this feature from my main considerations of novelty and inventive step. For completeness I will briefly discuss whether the inclusion of this feature would have had any impact on my overall conclusions.

- 26 In a similar vein claims 2 and 9, which specify similar ratios for the material making up the central portion and effective whetstone circular portion of the whetstone being manufactured also constitute added subject matter.

Claim construction and clarity

- 27 The construction of the independent claims is the key issue in this case.
- 28 Following *Kirin-Amgen* I have to determine what the person skilled in the art would have understood the patentee to be using the language of the claim to mean. The particular element of the independent claims which needs careful construction is the link between the reference whetstone and the whetstone being manufactured (“the revolving whetstone”) in accordance with the invention. This link is defined in the independent claims in the following way:
- A. The diameter of the revolving whetstone is equal to the diameter of the reference whetstone.
 - B. The diameter of the central portion of the revolving whetstone is equal to the diameter of the central portion of the reference whetstone but is made out of less material. It is therefore thinner than the central portion of the reference whetstone.
 - C. The effective whetstone circular portion of the revolving whetstone is made out of more material than the effective whetstone circular portion of the reference whetstone and is therefore thicker.
 - D. The amount of material used to make the central portion of the revolving whetstone is less than that of the reference whetstone by the same amount that the amount of material used to make the effective whetstone circular portion of the revolving whetstone is greater than that of the reference whetstone.
- 29 The applicant argues that for revolving whetstones manufactured according to claim 1 the effective whetstone circular portion diametrically outwards of the reference central portion diameter contains an increased amount of material equal to a reduction in the amount of whetstone material forming the central portion, as compared with the reference whetstone body. This, the applicant submits, provides a clear and concrete limitation on the claimed method and on whetstones manufactured in accordance with that method.
- 30 I am not convinced that this is the case. For any desired whetstone of variable thickness there will always be a corresponding “reference whetstone” of uniform thickness made out of the same quantity of material and satisfying the other criteria set out in claim 1. The inclusion of the notional reference whetstone does not therefore place any limitation in itself on whetstones manufactured in accordance

with the method of claim 1. In essence the reference whetstone merely defines the amount of material to be used to make the revolving whetstone, although this can be varied by varying the thickness of the notional reference whetstone. The manufacturer is free to make the whetstone to any configuration he chooses providing the effective whetstone circular portion is thicker than its central portion. Considering in his mind a notional reference whetstone in the manner set out in claim 1 does not limit this freedom in any way. I therefore find that the inclusion of the reference whetstone into claim 1 is obscure and does not provide any clear technical limitation either to the method of claim 1 or to the revolving whetstone of claim 8.

31 Even if I had not found that the further specific details of the reference whetstone referred to above were added subject matter my conclusion would be the same. Even if the proportion of the reference whetstone considered to be the central portion and the proportion considered to be the effective whetstone circular portion are specified the link between the revolving whetstone and the reference whetstone remains obscure for the reasons I have set out above.

32 I therefore construe claim 1 as follows:

A method of manufacturing a revolving whetstone comprising a disk-shaped whetstone body having a central portion and an effective whetstone circular portion formed with one body with the central portion and arranged circumferentially outside the central portion, the central portion being a portion in which a whetstone centre hole into which a whetstone driving shaft or grinder is arranged, the method including filling an abrasive grain and binder resin between two space moulds and pressing the moulds towards each other to form the whetstone body, the wall thickness of the central portion of the revolving whetstone being thinner than the wall thickness of the effective whetstone circular portion of the revolving whetstone.

33 Claim 8 has a similar construction as follows:

A revolving whetstone comprising a disk-shaped whetstone body having a central portion and an effective whetstone circular portion formed as one body with the central portion and arranged circumferentially outside the central portion, the central portion being a portion in which a whetstone centre hole into which a whetstone driving shaft or grinder is arranged, the wall thickness of the central portion of the revolving whetstone being thinner than the wall thickness of the effective whetstone circular portion of the revolving whetstone.

Other clarity issues

34 The examiner has highlighted other clarity issues with the claims. These do not affect the substance of my decision and I will not therefore consider them further, Should any claim be found to be allowable the application will need to be referred back to the examiner for further consideration of the clarity of the claims.

Novelty

35 The examiner considered that the invention claimed in claim 8 at least is not new in the light of documents D1-D4. Each of the documents above discloses a revolving whetstone with a central portion and an effective whetstone circular portion surrounding the central portion as in the present invention, the effective whetstone circular portion being thicker than the central portion. Each therefore discloses all of the features of claim 8 given the construction I have placed on claim 8.

Inventive step

36 I will follow *the Windsurfing/Pozzoli* approach in my assessment as to whether the claims include an inventive step.

(1)(a) Identify the notional “person skilled in the art”

This step is straightforward in this case. The person skilled in the art is a person skilled in designing and manufacturing whetstones.

(1)(b) Identify the common general knowledge of that person

37 The skilled person would be aware of various methods of manufacturing whetstones. They would in particular be aware of methods whereby a space between two spaced moulds is filled with abrasive grain and binder resin and pressed towards each other to form the whetstone body. This seems to me to be to be an entirely conventional manufacturing process. Although initially introduced to distinguish the invention from the prior art, I note that the argument that this is common general knowledge was not contested by the applicant when raised by the examiner.

(2) Identify the inventive concept of the claim in question or if that cannot be readily done, construe it.

38 My construction of claim 1 is set out in paragraph 32 above.

(3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or claim as construed.

39 The only difference between the inventive concept of the claim as construed and each of documents D1-D4 is the step of filling an abrasive grain and binder resin between two spaced moulds and pressing the moulds towards each other to form a said whetstone body.

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps that would have been obvious to the person skilled in the art or do they require any degree of invention?

40 I have found that the difference identified in the previous step is part of the common general knowledge of the person skilled in the art. It would therefore have been obvious at the priority date of the application to have manufactured the whetstone using the two moulds as described in claim 1. Claim 1 therefore lacks an inventive step.

The dependent claims

41 For completeness I will also briefly consider the dependent claims.

42 I have already found that claims 2 and 9 relate to added subject matter. Claims 5 and 12 disclose further details of the manufacture of the whetstone appear to be entirely standard and are part of the common general knowledge of the person skilled in the art. They therefore do not involve an inventive step.

- 43 Claims 3, 4, 10 and 11 relate to offset whetstones where the central portion is offset from the central circular portion. Such whetstones are disclosed in D1-D3 and are illustrated in their respective figures above. There is nothing inventive in selecting the specific parameters of claims 4 and 11, and indeed the description (see e.g. paragraph [0007] which is discussing a convention whetstone) seems to indicate that these parameters are standard in the art. These claims do not therefore involve an inventive step.
- 44 Finally, claims 6, 7, 13 and 14 are not straightforward to construe for similar reasons as for claim 1. In my view all they really state is that the thickness of the effective whetstone circular portion increases gradually from the rotation central side to the outer side. D1 and D4 at least disclose this feature as is shown in their respective figures above. These claims also do not therefore include an inventive step.

Conclusion

- 45 I have found that the claims include added subject matter, that claim 8 lacks novelty, and that the other claims including claim 1 lack an inventive step. I have inspected the application carefully and can find no amendment which would result in an allowable claim. I therefore refuse the application.

Appeal

- 46 Any appeal must be lodged within 28 days

B Micklewright

Deputy Director, acting for the Comptroller