

Privy Council Appeal No. 13 of 1914.

The Gold Ore Treatment Company of Western Australia, Limited
(in Liquidation), and others - - - - - *Appellants*

v.

The Golden Horseshoe Estates Company, Limited - - - - - *Respondents*

FROM

THE SUPREME COURT OF WESTERN AUSTRALIA.

JUDGMENT OF THE LORDS OF THE JUDICIAL COMMITTEE OF THE
PRIVY COUNCIL, DELIVERED THE 20TH JANUARY, 1919.

Present at the Hearing :

LORD BUCKMASTER.

LORD DUNEDIN.

LORD MOULTON.

LORD PARMOOR.

[*Delivered by* LORD DUNEDIN.]

This action was brought in respect of alleged infringement of letters patent of Western Australia, No. 601, of date 1894, commonly called the Sulman and Teed patent. Infringement was denied and the patent itself was attacked on various grounds. The Supreme Court of Western Australia held that the patent was bad on three grounds: (1) that the specification was insufficient as regards claims 1 and 2; (2) that as regards one method put forward the process was impossible; and, in (3) that as regards claim 6 there was no novelty. Appeal was taken from the judgment to this Board. There was pronounced by McMillan, J., an exceedingly clear and careful judgment setting forth his views for the three grounds above specified. As their Lordships agree with the conclusion reached on the first ground, they do not think it necessary to examine the other two.

The first matter for consideration is what is the general character of the patent. The specification, as always, must be examined in the light of what was common knowledge at its date. Now, at its date it was known that gold could be dissolved from the ore where it was found situate by the employment of cyanide of potassium (KCy). The cyanide of potassium would not work unaided, but required for efficient action the presence of oxygen. This oxygen could be supplied by air being freely admitted to the ore during treatment, or it could be supplied from water if chemical re-action was induced so as to cause hydrolysis. This was not only known as a chemical fact, but the commercial exploitation of the chemical facts had been rendered possible by the patent of McArthur and Forrest of 1887. Their patent had been worked in the South African gold field. In 1894 the whole thing was more or less of a novelty to the miners of Western Australia, but the South African experience was at their disposal.

Turning now to the specification it will be found that the patentees set forth that solution by means of KCy is known, that the process is lengthy, and attended with certain difficulties, and they then proceed to set forth the gist of their invention in these words:—

“ Now, we have found that halogen compounds of cyanogen—to wit, the chlorides, bromides or iodides of cyanogen—when added in certain proportions to cyanide of potassium in water form a series of solvents for precious metals, particularly gold, of great power and efficiency. The solution of the precious metal in such solvents is rapid and complete, and, whilst the solution is kept alkaline, the secondary reactions of the solvent on the other compounds of the ore, such as copper or iron pyrites, are very limited in extent, the shortness of the time required to dissolve the gold out of the ore reducing them to a minimum.”

The patent then proceeds:—

“ We may proceed in carrying out our invention in any of the following ways:—

- “ 1. We may form separately a chloride-bromide or iodide of cyanogen by any known and suitable method, and add a requisite proportion of any one or a mixture of such products to the requisite proportion of cyanide of potassium in water: this solution suitably diluted is then applied to the crushed ore or ore-products, which may be contained in any suitable tank or vessel, open or closed, constructed of any suitable material, such as wood. The solution of the gold or precious metal is effected in a very short time—in the case of some of our experiments an hour has been sufficient to extract the gold from a copper and iron pyrites, and quartz matrix—and the gold-bearing solution is then drawn off, and the precious metal recovered therefrom by any known means, but we prefer to use the process of precipitation and recovery hereinafter described. The cyanogen haloid may, if desired, be applied after the cyanide of potassium has been mixed with the ore.”

Nos. 2 and 3 need not be quoted; 2 deals with the formation of halogen compounds as part of the operation by acting upon

the potassium cyanide or the solution of any suitable cyanide of the alkalies or alkaline earths by chlorine, bromine, or iodine; 3 deals with a further alternative for the formation of halogen elements in the course of the process. The rest of the specification deals with other matters not pertaining to this inquiry.

Now, two things appear clearly from this. First, the invention is not for a new solvent in the proper sense of the word. The halogen compounds are not solvents of metal. The only solvent is the KCy, which was well known, but the invention is for an improvement on the old solvent, KCy, which is still used, but which is made, say the patentees, to work more efficiently, and rapidly, by the addition of the halogen compounds; (2) there is no indication of any particular way of working the invention. It must therefore be concluded that the new compound is to be worked practically as the old simple solvent was worked.

The learned Judge has described the class of people to whom a specification such as this must be taken to be addressed in language so concise and accurate that their Lordships do not hesitate to adopt it. He says :—

“The specification is therefore addressed to those persons engaged in gold mining in Western Australia who would be concerned with the extraction of gold from its ore, and who would have a knowledge of the existing cyanide process and a sufficient knowledge of chemistry to understand and work the described process. It is not addressed to the working miner on the one hand or the expert chemist on the other, but to the mine manager or his metallurgist or assayer.”

Such people would, as already pointed out, assume rightly that the actual manipulation of the solvent would be according to what they were accustomed to with the old. Now, what the practice was with the old is not in any doubt. As a practical process, the McArthur and Forrest patent held the field. It was worked as a percolation process through crushed ore, but the ore not reduced to a very fine dimension, or, to use mining parlance, not reduced to a slime. Slimes were avoided as much as possible and what was inevitable was put aside for separate treatment. Further, the existing method always included a large admixture of caustic alkali, designed to counteract the acid whether present in the solution or latent in the ore, which acid, if allowed to get the upper hand would destroy the cyanide of potassium. But, caustic alkali is destructive of bromo-cyanogen. If, therefore, the old method were followed the new solvent would not work. It is accordingly not surprising to learn that as a fact (and this fact is confirmed by the learned trial Judge) the new solvent applied according to the methods of the old was tried and abandoned at Brownhill, at Hanaan's Star, and Lake View Consol's, mines. It is clear that if a patentee puts forward a process without a warning note that if certain things are done it will be a failure, that specification will be insufficient unless the danger is such as common knowledge or

ordinary practice will avert. As to this, their Lordships are satisfied that there was, at the date of the patent, no knowledge in Western Australia, or, for the matter of that, generally, among the mining fraternity of the action of acid on bromo-cyanogen. The knowledge of experts such as Mr. Ballantyne, or Mr. Swinburne at this date is really not relevant to the matter in hand. Indeed, the subsequent history of the process is conclusive as to this fact. The Sulman and Teed patent was acquired by a company, who sent out Dr. Diehl as their manager. He experimented with the new process, and after a time, but not at first, he got the new solvent to work satisfactorily. He did so by reducing the ore to slimes and by deferring the addition of the alkali till after the bromo-cyanogen had had time to do its work. Now, that is a complete reversal of the ordinary method of manipulation. It follows that with this specification as it stands the class to whom it was addressed would so use the new solvent as to destroy its efficiency. The percolation did not suit it because the solvent is short-lived. Alkalinity did not suit it because in the quantities used as in the old process the alkali became a cyanicide. The cure for all this is not given in the specification and the cure is a matter which would not be suggested by what may be termed the common-sense of practical use, because it only came to be suggested when the facts which were seemingly unknown to the patentee came to be appreciated as a result of further experimental discovery.

It is unnecessary to quote evidence at length for the propositions of fact above laid down, which are all in accordance with the findings of the learned trial Judge, but they may be taken as summarised in a few sentences from the evidence of Dr. Diehl, the appellant's manager, and a witness for them. He says, as recorded in the Judge's notes, as follows:—

“ Use of alkali:—

“ 1 lb. of CaO will destroy considerably more than 1·4 lbs. of BrCy.

“ If lime is put in the crushed ore before adding the KCy solvent, such a practice if followed with the compound solution KCy plus BrCy will cause the lime to attack and destroy the BrCy.

“ In carrying out my process I added my lime some time after I put the solvent in so as to allow it as far as it consisted of BrCy to continue to exist.

“ Nobody else did it before me.”

“ The practice has always been and still is when plain KCy is used to add the lime before the solvent in such quantities that there will be an excess of caustic alkali when you introduce your KCy solvent.

“ I commenced my experiments in 1897.”

For these reasons their Lordships agree with the results arrived at by the learned trial Judge, namely, that the patent is bad because of the insufficiency of specification.

There is, however, one other thing which must be noticed. In the final address to their Lordships the learned counsel for the appellants with great ingenuity sought to put his case on

an entirely new basis from that on which it had hitherto been supported. The case, as fought in the courts below, and as indicated in the printed cases, was that protective alkalinity was necessarily fatal to the new solvent, but that it would have been naturally avoided by those who used the process. The learned counsel in his closing speech addressed himself particularly to certain experiments which had been put in by the respondents. These experiments were put in for the purpose of showing the rapid disappearance of the *CyBr*. They were made by putting 4 inches of ore in a set of 5 connected and superimposed vessels, allowing the solvent to percolate from one vessel to the other, and then at each vessel determining the remanent solvent, distinguishing between the *KCy*, the *CyBr*, and the gold remaining unextracted. The experiments were made with plain *KCy* with protective alkalinity; with the patented solvent with protective alkalinity, and with the same without protective alkalinity. The experiments show that the *CyBr* practically disappeared after the passage through the first layer, but the learned counsel, taking, as he was entitled to do, the entire results, pointed out that the total extraction of gold was rather better with the new solvent plus protective alkalinity than it was either with the plain *KCy* or *KCy* and *CyBr* without protective alkalinity; and, from that, he argued that it was shown that the new solvent was a practical success even if worked in the old way.

It must always be a matter of doubt when the deciding point of a case is found by the ingenuity of counsel in the last speech. Their Lordships, however, are not moved by the argument because they think that to hold in accordance with it would be—apart from the change of face in the conduct of the case—to put far too much weight on mere laboratory experiments. The great difference between experiments and the practical working is that the ore dealt with was only contained in five 4-inch layers—very different from the actual conditions. It will also be noticed that the total extraction is very small, under 57 per cent., which would not be accepted as satisfactory practice. The truth is that the experiments, read in the light of present knowledge, really point to the efficiency of the method discovered by Dr. Diehl, namely, to let the *CyBr* do its own work at first in favourable conditions—*i.e.*, by contact with slimes—and then protect the *KCy* by adding the alkali sometime after the operation had begun.

On the whole matter their Lordships agree with the very careful judgment of the learned trial Judge on the point of insufficiency. They express no opinion on the other points raised against the patent. They will humbly advise His Majesty to affirm the judgment. The costs will be dealt with in the second appeal.

In the Privy Council.

THE GOLD ORE TREATMENT COMPANY OF
WESTERN AUSTRALIA, LIMITED (IN LIQUI-
DATION), AND OTHERS

v.

THE GOLDEN HORSESHOE ESTATES COMPANY,
LIMITED.

DELIVERED BY LORD DUNEDIN.

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