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2, 1952

In the Privy Council.

No. ⁴⁰50 of 1950.

ON APPEAL FROM THE SUPREME
COURT OF CANADA

UNIVERSITY OF LONDON
W.C.1
12 NOV 1956
INSTITUTE OF ADVANCED
LEGAL STUDIES

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BETWEEN

MINERALS SEPARATION NORTH AMERICAN
CORPORATION APPELLANT
AND
NORANDA MINES, LIMITED RESPONDENT.

CASE FOR THE RESPONDENT

RECORD

1.—This is an Appeal from a judgment of the Supreme Court of Canada reversing a judgment of the Exchequer Court of Canada which had held Claim 9 of Canadian Patent No. 247,576, granted to the appellant (plaintiff) on March 10, 1925, for an invention of C. H. Keller relating to the froth flotation of ores, to be valid and to have been infringed by the respondent (defendant). p. 1149 p. 1110

10 2.—The froth flotation concentration process is one for treating an ore to separate the desirable minerals containing the metals to be recovered (the values) from the worthless minerals (the gangue). The ore is ground in water to form an ore pulp. After dilution with water and addition of a frothing agent, e.g. pine oil, the pulp is violently agitated with simultaneous introduction of air so that a voluminous froth is formed on it. The pulp may be either acid or alkaline, as a result of appropriate additions of acid or alkaline chemicals, or may be neutral, the choice depending on the nature of the ore or of the frothing agent. A flotation operation is said to be carried on in an acid, alkaline or neutral circuit according to whether the pulp is acid, alkaline or neutral. The frothing agent has the property of tending to cause particles of values to adhere to the bubbles as they rise to the pulp, and this action can be enhanced by the addition of a suitable collecting

agent. The froth is removed from the remainder of the pulp known as the tailings, the minerals contained in the froth being known as the concentrate. The froth is then filtered and the concentrate smelted to recover the desired metal.

3.—The opening paragraphs of the disclosure of the patent, following the preamble, read as follows :

“ 2. The invention relates to the froth-flotation concentration of ores, and is herein described as applied to the concentration of certain ores with mineral-frothing agents in the presence of certain organic compounds containing sulphur. 10

“ 3. It has been found that certain sulphur derivatives of carbonic acid greatly increase the efficiency of the froth-flotation process when used in connection with mineral-frothing agents. The increased efficiency shows itself sometimes in markedly better recoveries, sometimes in effecting the usual recoveries with greatly reduced quantities of the usual mineral-frothing agents, and sometimes in greatly reducing the time needed for agitation to produce the desired recoveries.

“ 4. The invention is herein disclosed in some detail as carried out with salts of the sulphur derivatives of carbonic acid 20 containing an organic radical, such as an alkyl radical and known as xanthates, as the new substance. These form anions and cations in solution. Excellent results were also obtained by agitating ore pulps with the complex mixture produced when 33½ per cent. of pine oil was incorporated with an alcoholic solution of potassium hydrate, and xanthates or analogous substances were produced by adding carbon disulphide to this mixture.”

Paragraph 5 describes the appearance of a galena-bearing froth obtained with “ xanthates or analogous substances.” Paragraph 6 points out that 30 “ the substances referred to ” are not mineral-frothing agents, speaks of their effectiveness in enabling selective flotation of lead and zinc, and says that the pulps “ may be either acid, alkaline or neutral according to circumstances.” Paragraph 7 describes the production of “ a yellow or orange salt ” which is potassium trithiocarbonate mixed with some sodium carbonate. The xanthates, and potassium trithiocarbonate (which is not a xanthate) are all sulphur derivatives of carbonic acid. The rest of the disclosure deals only with potassium xanthate, of which the full chemical name is potassium ethyl xanthate, and sodium xanthate, paragraph 8 describing the preparation of potassium xanthate for laboratory purposes 40 and the remaining paragraphs (9–19) describing the results of various tests with the two compounds.

4.—The specification has 11 claims of which the appellant has only sought in this action to uphold Claims 6, 7, 8 and 9. However for the purposes of construing the specification, it is essential to realise that the invention claimed in the broad claims is of great width, for instance, Claims 1 and 10 are as follows :—

10 “1. The process of concentrating ores which consists in agitating a suitable pulp of an ore with a mineral-frothing agent and a sulphur derivative of carbonic acid adapted to form in solution anions and cations and adapted to co-operate with the mineral-frothing agent to produce by the action of both a mineral-bearing froth containing a large proportion of a mineral of the ore, said agitation being so conducted as to form such a froth, and separating the froth.”

20 “10. The process of concentrating ores which consists in agitating a suitable pulp of an ore with mineral-frothing agent and a sulphur derivative of carbonic acid containing an organic radical and adapted to co-operate with the mineral-frothing agent to produce by the action of both a mineral-bearing froth containing a large proportion of a mineral of the ore, said agitation being so conducted as to form such a froth, and separating the froth.”

These claims both cover xanthates, *inter alia*. The four claims sued upon, which are among the narrowest in the specification, are :—

30 “6. The process of concentrating ores which consists in agitating a suitable pulp of an ore with a mineral-frothing agent and an alkaline xanthate adapted to co-operate with the mineral frothing agent to produce by the action of both a mineral-bearing froth containing a large proportion of a mineral of the ore, said agitation being so conducted as to form such a froth, and separating the froth.

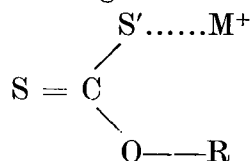
“7. The improvement in the concentration of minerals by flotation which comprises subjecting the mineral in the form of a non-acid pulp to a flotation operation in the presence of a xanthate.

“8. The improvement in the concentration of minerals by flotation which comprises subjecting the mineral in the form of a non-acid pulp to a flotation operation in the presence of potassium xanthate.

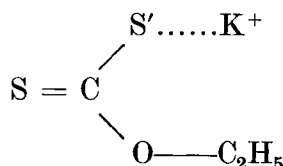
40 “9. The improvement in the concentration of minerals by flotation which comprises subjecting the mineral in the form of a non-acid pulp to a flotation operation in the presence of a xanthate and a frothing agent.”

RECORD

5.—Xanthates are compounds of which the constitution of each molecule is represented by the following chemical structural formula :—



This formula shows that a xanthate molecule is composed of an atom of carbon (C) having connected to it, in the arrangement shown, two atoms of sulphur (S) and one atom of oxygen (O). An organic radical (R) is connected to the oxygen atom, while one of the sulphur atoms (S¹) has associated with it a metal ion (M⁺). A radical is a group of atoms arranged in a particular way, which has no practical independent existence but passes without alteration through various chemical changes, an organic radical being one which contains carbon. Thus, the ethyl radical (C₂H₅) which is an organic radical composed of two atoms of carbon and five atoms of hydrogen in a particular arrangement, when combined with the hydroxyl radical (OH) gives ethyl alcohol (C₂H₅OH), more commonly known as grain alcohol or simply as alcohol, but when it takes the place of R in the above formula gives an ethyl xanthate. To characterise a specific xanthate fully it is necessary to name the particular metal as well as the particular radical. Thus, if the organic radical (R) is ethyl (C₂H₅) and the metal (M) is potassium (K), the compound is potassium ethyl xanthate, of which the formula is :—



Xanthates were well known chemical compounds when Keller came into the field in 1923. According to the literature, various ethyl xanthates had been made as early as 1822, and by 1923 over ninety different xanthates had been made with various organic radicals and various metals. With regard to many of these, there was a considerable volume of published work. The only xanthate that appears to have been commercially used in 1923, at the time of Keller's development of the use of xanthates, was sodium cellulose xanthate, in which the organic radical is the cellulose residue. This xanthate was well known in the manufacture of rayon. It is, however, useless in flotation as are also certain heavy metal xanthates.

6.—If Claims 6, 7 and 9 are valid and of the width contended for by the appellant there is no doubt that they have been infringed. Claim 8, if valid, has not been infringed. None of these claims, however, is valid, for the following reasons :—

(A) Claims 7 and 9 include xanthates useless in flotation processes.

p. 420/1

p. 420/17

p. 1039

p. 1041/12, 18, 25

p. 1040/25

p. 220/16

p. 535/36

p. 236/4

(B) Claim 6 is ambiguous and further either is a mere "problem claim" or includes xanthates useless in flotation processes.

(C) Claims 7 and 8 include the use of xanthates in the absence of a separate frothing agent and so include useless cases.

Furthermore, the respondent contends that the whole patent is void, for the following reasons:—

10 (D) The specification did not comply with the requirements of s. 14 of the Patent Act, Statutes of Canada, 1923, Chap. 23 by reason of obscurity and because the patentee did not give a full and frank disclosure of the invention in that

(i) Trials before the patent application was filed showed the patentee that the xanthates used in an acid circuit must not contain trithiocarbonate. No warning of this was given in the specification and in fact trithiocarbonate is a substance recommended for use in certain flotation processes and whose use is within Claims 1 and 2 of the specification.

20 (ii) The patentee failed to warn the public that the process would not work with oxide ores.

(E) The invention had been known by one Martin and other persons before it was made by Keller.

7.—In the Exchequer Court, Thorson, P., in elaborate reasons for judgment, held that the specification did comply with the statutory conditions, and that there was no prior knowledge of the invention by Martin. Although some xanthates, i.e. cellulose xanthates and certain heavy metal xanthates, are useless in flotation, he held Claim 9 valid on the ground that the meaning of the word "xanthate" in Claim 9 should be limited by reading into the Claim a passage taken from paragraph 4 of the specification. He considered the useless xanthates to be excluded from
30 Claim 9 when read in this way, the cellulose xanthates as having an organic radical which was not an alkyl radical in the strictest sense of that term, and the heavy metal xanthates as well as the cellulose xanthates as not being soluble in the sense in which a froth flotation metallurgist would understand that term. He held Claim 6 invalid for ambiguity, and did not find it necessary to deal with Claims 7 and 8. The respondents submit that in construing Claim 9 as he did, Thorson, P., departed from the fundamental rule of construction of patent specifications as laid down, for instance, by Lord Russell of Killowen in *E.M.I. v. Lissen* (1939) 56 R.P.C. 23.

8.—The Supreme Court by a majority (Rand, Kellock, Estey and
40 Locke, JJ., Kerwin, J., dissenting) reversed the trial judgment as to Claim 9 and held Claims 6 and 7 invalid. Rand, Estey and Locke, JJ., held Claim 8 invalid and Kellock, J., held that it was not infringed.

9.—Rand, J. (with whom Locke, J., concurred) considered that the specification met the requirements of the statute, but was quite unable to draw the conclusion that the language of paragraph 4 was "intended to

pp. 1044-1109

p. 1087/41 to
p. 1089/91p. 1089/42 to
p. 1090/47
p. 1090/33 to 37p. 1068/11 to
p. 1069/16,
p. 1092/9 to 23
p. 1089/47 to
1090/42
p. 1079/34 to
1080/37

pp. 1131-1141

p. 1136/17

“furnish a conventional meaning of xanthate to be carried forward into the claims.” He considered accordingly that in Claims 7 and 9 “a xanthate” meant “any xanthate” and included the cellulose xanthates. He observed that when the language of paragraph 4 was set against that of the claims a good example was given of the “carefully prepared sentences in the specification which, it is hoped, will be just enough to limit the claim within safe dimensions if it is attacked in Court,” mentioned by Lord Loreburn in *Natural Colour v. Bioschemes* (1915) 32 R.P.C. 256, at p. 266. He was of the opinion that the reference to a frothing agent in claim 9 and its omission from Claims 7 and 8 showed that Claims 7 and 8 covered processes in which no separate frothing agent was used, and that on that ground they failed. He rejected the present appellant’s contention that sodium xanthate should be considered covered by Claim 8 as an equivalent of potassium xanthate. He thought it a reasonable inference that the expression “alkaline xanthate” in Claim 6 meant xanthates in the making of which an alkali was used, but found that on such an interpretation the claim would extend to sodium cellulose xanthate and so could not stand. 10

pp. 1121-1131

10.—Kellock, J., did not deal with the sufficiency of the specification as a whole, but confined his consideration to paragraph 4 and the validity, in the light of it, of the claims relied upon. He held that the expression “an organic radical, such as an alkyl radical” in paragraph 4 indicated an intention to refer to alkyl radicals only by way of example, a conclusion confirmed by the fact that the patentee had at first used (in his original United States application) the phrase “salts of the alkyl sulphur derivatives of carbonic acid known as xanthates,” and had only later altered this to read “salts of the sulphur derivatives of carbonic acid containing an organic radical, such as an alkyl radical and known as xanthates.” He considered that the cellulose xanthates were soluble within the meaning of the second sentence of paragraph 4, and therefore that it came within the meaning of that paragraph. In any event, however, he was of the opinion, like Rand, J., that the expression “a xanthate” in the claims could not be read as limited to the xanthates described in paragraph 4. In the circumstances, he held Claims 7 and 9 invalid. He considered that there was ambiguity in the term “alkaline xanthate” in Claim 6 and that if it were interpreted, as the present appellant suggested, to mean “alkali metal xanthate” the claim would extend to sodium cellulose xanthate and would be invalid. He thought it “impossible to contend that in using the expression ‘potassium xanthate’ in Claim 8, anything else but that substance was intended to be included,” and accordingly considered that the claim was not infringed. 20 30 40

p. 1131/30

pp. 1141-1148

11.—Estey, J., directed his consideration of the patent principally to the disclosure. He first considered the expression “sulphur derivatives of carbonic acid” and was of opinion (as Rand, J., was) that the phrase should be construed as having a restricted scope, rather than the wider one which the respondent’s expert had suggested as possible. He agreed with Thorson, P., that, in the expression “such as an alkyl radical” in paragraph 4, the word “alkyl” should be given a restricted sense rather than the wider

one in which it was used by some authorities, and that the words "such as" meant "of the type of." He thought it, however, of significance that the inventor did not indicate that "alkyl" was used in a restricted sense, but "actually added to the confusion" by deliberate choice of the expression "such as an alkyl radical," as shown by the amendment of the corresponding United States application. In his view the language chosen showed that the inventor meant to include more than alkyl radicals, though he pointed out that the present appellant throughout the evidence appeared to treat the words "such as" as meaning "restricted to." He found that

10 the specification gave no information as to what was included by the phrase "such as an alkyl radical," but observed that the inventor had found xanthates with an alkyl radical soluble in water to be useful and that the evidence indicated that so far as xanthates were concerned this constituted the invention Keller had made. He then continued:

"The language of the specification, however, is not so restricted. The language there adopted leads the reader into a field that was unknown to the inventor and which in the specification is not defined. In fact beginning with the phrase 'sulphur derivatives' almost every important phrase, as already indicated, is so used that issues such as are here raised were almost inevitable. That in itself is indicative of ambiguity and the absence of that clarity which Section 14 (1) of the Patent Act contemplates."

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After pointing out another ambiguity inherent in the phrase under consideration, namely what test was to be applied to determine what is "such as an alkyl radical," the learned judge concluded that the specification did not fully and correctly describe the invention as required by the Act, that the ambiguity persisted through the claims, and that in the claims relied upon

30 "it is not stated 'distinctly the things or combinations which the applicant regards as new and in which he claims an exclusive property and 'privilege' within the meaning of section 14 (1)."

12.—Kerwin J. (dissenting) considered that in accordance with the principle that claims must be construed in the light of the rest of the specification "xanthate" as used in Claim 9 must be read as limited by the "definition in the disclosure," he said, ". . . xanthate is a technical chemical word for which there is no precise meaning and, therefore, the inventor supplied one in paragraph 4 of the disclosure." In saying this Kerwin, J., appears to be relying upon a passage in the Judgment in the Exchequer Court where Thorson, P., had referred to a number of

40 dictionaries which were not put to the expert witnesses on this point and some of which gave a narrow meaning to the word "xanthate" although he then said "On the evidence of the experts a wider meaning than the common dictionary one was given which did include cellulose xanthates." The respondent submits that there is no justification for saying that the term "a xanthate" excludes any compound whose chemical name includes the word "xanthate" i.e. excludes any compound having the formula given in paragraph 5 of this Case. Kerwin, J., however, taking the view he did of

p. 1144/10

p. 1147/10

p. 1147/46

pp. 1116-1121

p. 1119/29

p. 1119/43

pp. 1087/41
to 1089/5

RECORD

the meaning of "xanthate" and the function of paragraph 4, set out what he found to be Keller's disclosure in terms resembling Claim 3 of the specification. He then adds that he was "satisfied that Keller's disclosure was limited to a certain kind of xanthates, which did not include cellulose xanthates and heavy metal xanthates," and was of opinion, in the circumstances, that Claim 9 was valid.

13.—The respondent submits that, for the reasons given by Rand J., Locke J. and Kellock J., the wide and general expression "a xanthate" in the claims cannot be cut down by any reference to paragraph 4 of the disclosure. This paragraph, the respondent submits, is not a definition of xanthate for the purposes of the patent, as Kerwin J. assumes it to be; the paragraph is simply, as the language indicates, a statement that "the invention is herein disclosed in some detail" as carried out with xanthates. There is nothing whatever about it which suggests any restriction to these substances. To limit the meaning of "a xanthate" in the claims by referring to such language in the disclosure would be, as Lord Loreburn said in *Ingersoll v. Consolidated* (1908) 25 R.P.C. 61, at p. 84, "to construe the claim with reference to the specification, not in order to understand what the former says, but to make it say things which in fact it does not say at all" (see also *Norton & Gregory Ltd. v. Jacobs* (1937) 54 R.P.C. 271, *E.M.I. v. Lissen* (1939) 56 R.P.C. 23).

14.—If paragraph 4 is to be regarded as governing the scope of the claims relied upon, the latter do not, in the respondent's submission, exclude cellulose xanthates and heavy metal xanthates which are useless in flotation. The relevant part of paragraph 4 consists of the first two sentences which will be discussed separately.

15.—The respondent submits that Kellock J. was rightly of the opinion that the use of the expression "an organic radical, such as an alkyl radical" in the first sentence of paragraph 4, shows an intention to refer to alkyl radicals only by way of example. If, however, the expression means that the radical is to be of the type of an alkyl radical then there arises the ambiguity, to which Estey J. referred, with respect to the test to be applied to determine whether a radical is of the type of an alkyl radical. In the case of the cellulose radical this ambiguity does not give rise to practical difficulty because that radical is of the type of an alkyl radical when compared as suggested by Estey J. From the point of view of effect in chemical reactions, both radicals behave in the same way in the relevant reaction, namely the xanthate forming reaction. Sodium ethyl xanthate, which contains an alkyl radical, is formed by the reaction of ethyl alcohol with carbon disulphide and caustic soda. Cellulose reacts like a number of simple alcohols, forming sodium cellulose xanthate with carbon disulphide and caustic soda. There is no possible definition of "an organic radical such as an alkyl radical" in the context other than: a radical capable of forming a xanthate. Thus there appears to be no justification for treating this sentence as doing anything more than citing alkyl radicals as being typical examples of radicals which may be found in xanthates.

- 16.—The second sentence of paragraph 4 reads : “ These form anions and cations in solution.” Even if paragraph 4 can be said to contain a definition of “ a xanthate,” this sentence, the respondent submits, forms no part of that definition. Had it been meant to qualify the first sentence it would have been connected to that sentence as a modifying clause (see *Sharp & Dohme v. Boots* (1928) 45 R.P.C. 153, per Lord Hanworth M.R. at p. 170/32 and Sargant L.J. at p. 176/44). In any event this phrase is incapable of defining any limited class of xanthates because xanthates by definition are salts and all salts form anions and cations in solution. It is said that this sentence is only concerned with compounds which are highly soluble in water. The property of forming anions and cations in solution has, however, nothing to do with the degree of solubility. Glass, which for practical purposes is considered by a chemist to be insoluble, will form anions and cations in water ; sugar, though rapidly soluble, does not. Of the heavy metal xanthates, copper xanthate is extremely insoluble and some of the others might give a very slight solution ; but in every case so much of the salt as is dissolved exists in the solution in the form of anions and cations. Even if the claim were held limited to the use of soluble xanthates, this would not exclude the cellulose xanthates of which the potassium salt is soluble to the extent of 1 per cent. in water (and more in alkaline solutions). This is well above the figure which an organic chemist would take as the limit of solubility. Thorson P. said :—

“ On the other hand, a much higher degree of solubility would be expected by the chemist or metallurgist engaged in froth flotation for he would think of solubility in relation to the quantity of water used in froth flotation, and if a larger amount of water, judged by such a standard, is required to dissolve a substance it would be regarded by him as substantially insoluble.”

- 30 However, flotation reagents are normally used in minute amounts. Thus the specification in suit suggests the use of amounts of xanthates as low as 0.15 lb. per ton of ore, i.e. of about one part in 60,000 of water. (About 4 parts of water are used to each part of ore). In practice amounts of sodium ethyl xanthate as low as .05 lb. per ton (about 1 part in 150,000) may be used.
- Moreover Keller himself regarded a flotation agent then in use, which was not completely soluble in a concentration of 1 part in 1,000,000 of water, nevertheless to be a soluble flotation agent.

- 17.—Accordingly, the respondent submits that cellulose xanthates and heavy metal xanthates are included within the scope of paragraph 4 and are thus, on any interpretation, within the scope of Claims 7 and 9 which call for the use of “ a xanthate.”

18.—Claim 6 the respondent submits is ambiguous for the reasons given by Kellock, J. and Thorson, P. Moreover this claim (as well as the seven claims not sued upon) is on its face a mere “ problem claim.” As observed by Rand, J., it purports to confine the invention to the use of

RECORD

substances "adapted to co-operate with the mineral frothing agent to produce by the action of both a mineral bearing froth containing a large proportion of a mineral of the ore." No indication is given in the specification, however, as to which reagents will satisfy this limitation (either generally, or in relation to any particular ore). Consequently these claims appear instead of defining the invention in clear terms merely to set the addressee a problem—that of finding out by experiment which substances will work and which will not. This is not a legitimate sort of claim : *Smiths Patent* (1914) 31 R.P.C. 237 at 250 approved, *National Colour v. Bioschemes* (1915) 32 R.P.C. 236, at p. 266. *Stevens v. Keating* 10 (1847) 2 W.P.C. 172 at pp. 185, 188, 194. If on the other hand this attempt to limit the claims to useful cases is not to be taken at its face value, then these eight claims, like the remaining three, include the use of combinations of ingredients which will not work, and are invalid for that reason.

In particular Claim 6 covers the use of sodium cellulose xanthate, as found by Rand, J., Locke, J., and Kellock, J.

19.—Claims 7 and 8 in the respondent's submission are invalid as found by Rand, J. and Locke, J., since they extend to the use of xanthates, without a frothing agent whereas xanthates are incapable of effecting 20 flotation by themselves. Moreover the respondent submits that Rand, J. Locke, J. and Kellock, J., correctly concluded that, if Claim 8 is valid, it was not infringed by the use of sodium xanthate.

20.—The respondent further submits that Estey J. was right in holding that the patent as a whole is invalid for failure correctly and fully to describe in the specification the invention so far as it related to xanthates, and for persistent ambiguity in both the body of the specification and the claims.

21.—There are two further respects in which, in the respondent's submission, the patentee has failed in his duty, referred to by Fletcher 30 Moulton L.J. in *Vidal Dyes v. Levinstein* (1912) 29 R.P.C. 245, at p. 269/4, of acting towards the public *uberrima fide* and giving the best information in his power as to how to carry out the invention, and in which the specification is insufficient in putting forward the process without the "warning note" that if certain things are done it will be a failure" referred to by Lord Dunedin in *Gold Ore v. Golden Horseshoe* (1919) 36 R.P.C. 95, at p. 132/20.

22.—In paragraph 7, the patentee puts forward the use of "a yellow or orange salt" of which the useful ingredient is potassium tri-thiocarbonate. This paragraph did not appear in the original corresponding United States 40 application but was inserted by amendment in March, 1924, as "an example of the practice of the invention" and appeared in the specification of the Canadian application filed on October 24, 1924. It gives only the result of the first test made with the salt in 1922. In the first part of 1923, however, six further tests had been made on various ores in acid, alkaline and neutral pulps, which appear inconclusive, the last bearing the notation "no results

pp. 57/30, 104/23,
Ex. Bk. 1-29, 31

p. 878

pp. 890/31, 878/29,
892/21

p. 916/44

p. 198/25 ; Ex.
Bk. II, p. 48

Supp. Binder. Ex.
Bk.-20, pp. 249,
267, 278, 279, 351

—no selection test discarded” and being confirmed by tests before the trial on the respondent’s similar ore which showed the salt to be useless as a flotation collection reagent. Moreover, in August, 1923, the patentee had learned that the use of potassium trithiocarbonate even as a minor impurity in potassium xanthate was to be avoided in an acid circuit such as that used at the Anaconda mine where it was found to liberate hydrogen sulphide which had “a decided deadening effect on the copper mineral.” The specification, however, gives no warning that the salt is in some cases valueless in itself and in some actually a harmful impurity.

pp. 520/18, 536/32
pp. 832, 836/17,
840/26, 848
p. 832/29

- 10 23.—If the metalliferous mineral of an ore is a chemical compound of the metal with sulphur the ore is called a sulphide ore, and if it is a chemical compound of the metal with oxygen the ore is called an oxide ore. It was known in 1923 that oxide ores could not be recovered by froth flotation without first being subjected to the action of a sulphidizing agent. Keller first thought of xanthate as a sulphidizing agent (i.e., an agent for use in floating oxide ores) during a search he was making in 1922 for such an agent. However, after experiments he found that xanthate did not work on oxide ores, i.e. was not a sulphidizing agent, and he so reported to the appellant. Notwithstanding this, there is no word of warning in the specification to enable others to determine the limits of the utility of xanthates in flotation without the same fruitless experiments as Keller had made. Others did in fact think as Keller first thought.

p. 541/31ff
p. 595/13
p. 179/28
pp. 181/19 and
197/13
pp. 180/1, 181/1
p. 205/17, 772/3
p. 860/33

24.—A most important contention of the respondent in both Courts below was that even if the patent were open to no criticism on any of the grounds discussed above, it is nevertheless invalid because of knowledge of the use of xanthates in flotation by one Martin and alternatively of disclosure of that knowledge by Martin and the consequent knowledge by others in 1915, seven years before Keller’s first idea of such use in 1922.

- 30 25.—Martin entered the employ of the appellant’s predecessor under an employment agreement dated March 6th, 1915. By another agreement of the same date he gave to Minerals Separation, Ltd., an associated company, an option to purchase from him certain inventions of reagents for use in froth flotation. On the same day, he disclosed those inventions to Higgins (the chief metallurgist of the associated company) and to Williams, the patent lawyer of both companies. Among the reagents whose use Martin disclosed was “Natrola,” a name he used for a composition which he later called “Stanol” at Minerals Separation. He described it as a composition made from alcohol, carbon disulphide and caustic soda with an exothermic reaction and forming crystals dissolving readily in water. Those ingredients do react together, exothermically, forming sodium xanthate which is crystalline and readily soluble.

p. 684
pp. 683/35, 244/18,
630
p. 636/20
242/4
p. 256/6
p. 683/35
Ex. Bk. I, p. 28 ;
pp. 50 38-52/18
59/20, 937/40,
794/29
pp. 641/4, 642/1

26.—Martin later prepared a document dated August 15th, 1915, and referred to as Bulletin 2, which described the preparation of his flotation reagents including Stanol. The part relating to Stanol, after giving several Stanol formulæ, with the ingredients in different proportions, gives the

pp. 725-31
p. 730-1

RECORD

chemical equation for the formation of potassium ethyl xanthate and names this compound, observing that it

p. 731/19

“ . . . is soluble in alcohol and can be employed at any strength to effect flotation of copper salts.

“ Potassium xanthate is not a frothing agent and therefore it must be mixed with some appropriate agents that will give a voluminous froth. Alcohol, resin and pine oil seem to be the most suitable agents for this purpose.”

The bulletin concludes :—

p. 731/40

“ A very good compound is made up for alkali ores by using 10 20 per cent. sodium ethyl xanthate and 80 per cent. denatured alcohol.”

p. 304/8

p. 642/32, p. 736/16

p. 643/18

Bulletin 2 was received by Higgins on September 14th, 1915, and by Ballot, the president of the Company, a little later, and was discussed with Martin by Higgins. Ballot had not “ the time and patience to disentangle his (Martin’s) meaning ” and Higgins’ only action as a result of receiving the bulletin appears to have been to ask Martin to put into a book for reference the best of each of his formulæ, which Martin did. Higgins appears to have taken no steps to test the xanthates referred to in the bulletin.

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pp. 509/13, 730/28

pp. 543/15; p. 1036, cols. 3 & 3a; p. 517/27

27.—For the purposes of this action, the respondent’s witness Bennett tested in flotation a Stanol which he made according to the directions in Bulletin 2 with the proportions specified under “ D.” He obtained as good results when using it as a collection agent as with sodium ethyl xanthate. The concentrations used varied from 0.45 lb. to 1.13 lb. of Stanol D per ton of ore. (The xanthate concentrations mentioned in the specification in suit range from 0.15 to 0.69 lb. per ton of ore.)

28.—In the Supreme Court only Kerwin J. found it necessary to consider Martin. His conclusion on the point and his reasons, essentially the same as those of Thorson P., are as follows :—

p. 1121/4

“ Nowhere did Martin claim that Stanol was xanthate. He was thinking of Stanol only and while he theorized as to there being some xanthate in it and that it should be effective in flotations, the evidence all leads to the conclusion that he did not know the value or use of xanthate as such ; that is, he did not know the invention that Keller later made.”

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29.—It is true that Martin did not assert that Stanol was xanthate, but, in the respondent’s submission, that he did not explicitly disclose the use of xanthate is not tenable in face of Bulletin 2. Martin there speaks of the use of potassium xanthate for flotation, says it is not a frothing agent and therefore must be mixed with one, and suggests alcohol and pine oil for this purpose. Again, he refers specifically to the use of sodium xanthate for alkali ores, the alcohol in the ratio of 80 per cent. to 20 per cent. xanthate being presumably used as a frothing agent. This is a clear direction to use xanthates in flotation.

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30.—Even if Martin had confined himself to disclosing the use of Stanol in flotation, without realising that xanthate was an active ingredient, this would still have been sufficient to invalidate the later patent now in suit. The question is whether the claims of the later patent do or do not include that which was known to Martin, and alternatively known to others, by reason of Martin's disclosure; or (in other words) whether the carrying out of Martin's directions, after the grant of the patent, would or would not constitute infringement. It is clear, in the respondent's submission, that this question must be answered in the affirmative: Stanol prepared as directed by Martin does contain sodium or potassium ethyl xanthate as its active ingredient, and its use falls within the claims of the patent in suit regardless of the name by which it is called. Thorson, P., raises the further objection that the disclosure by Martin was confidential; but there is nothing to that effect in his agreement of employment, nor in the option agreement made at the same time, and there are no grounds for implying anything to that effect into either agreement. Nor, in Canadian law, can this affect the validity of a patent, at least where the grant was made before 1927: *Rice v. Christiani*, 48 R.P.C. 511, [1931] A.C. 770. p. 1106

31.—The respondent submits that this Appeal should be dismissed for the following, among other

REASONS

- (1) BECAUSE the decision of the Supreme Court of Canada was right and should be affirmed.
- (2) CLAIMS 7 and 9 are invalid because they include xanthates which are useless in flotation processes.
- (3) CLAIM 6 is invalid for ambiguity and either as a "problem claim" or as including xanthates which are useless in flotation processes.
- (4) CLAIMS 7 and 8 are invalid because they include the use of xanthates in flotation without a separate frothing agent, and so include useless cases.
- (5) CLAIM 8, if valid, has not been infringed.
- (6) THE patent as a whole is invalid because the specification did not comply with the provisions of Section 14 of the Patent Act, Statutes of Canada, 1923, Chap 23, by reason of its obscurity and because the patentee did not give a full and frank disclosure of his invention.
- (7) THE patent as a whole is invalid because the alleged invention was known by others before it was made by the inventor named in the patent.

BASIL DREWE.

CHRISTOPHER ROBINSON.

In the Privy Council.

No. ~~58~~⁴⁸ of 1950.

ON APPEAL FROM THE SUPREME COURT OF
CANADA.

BETWEEN
MINERALS SEPARATION NORTH
AMERICAN CORPORATION
APPELLANT
AND
NORANDA MINES, LIMITED
RESPONDENT.

CASE FOR THE RESPONDENT

LAWRENCE JONES & CO.,
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Old Broad Street,
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