[HIGH COURT OF AUSTRALIA.]

BROKEN HILL SOUTH SILVER MINING CO. NO LIABILITY } PETITIONERS;

AND

N. GUTHRIDGE LIMITED . . . . RESPONDENTS.

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MELBOURNE, *November* 10, 11, 12, 16, 17, 18, 19, 20, 23, 24, 30.

Isaacs J.

Patent—Revocation—Want of novelty—Anticipation—Combination.

An invention, entitled "Improvements in shaking table ore concentrators," for which letters patent were granted by the Commonwealth:

Held, on the evidence, to be not novel, and to have been anticipated, and the letters patent ordered to be revoked.

Observations on the requirements and validity of a claim for a combination.

Clark v. *Adie* (2 App. Cas., 315); *Wilfley Ore Concentrator Syndicate Ltd.* v. *N. Guthridge Ltd.* ((1906) A.C., 548), and *Moore & Hesketh* v. *Phillips* (4 C.L.R., 1411), applied.

PETITION for revocation of letters patent.

N. Guthridge Limited, a company incorporated in Victoria, were the patentees of an invention described in Letters Patent No. 564 of the Commonwealth, dated 1st June 1904, for "Improvements in shaking table ore concentrators." The Broken Hill South Silver Mining Co. No Liability, a mining company incorporated in Victoria, with the approval of the Attorney-General for the Commonwealth, by this petition prayed for the revocation of the letters patent on the grounds that the invention was not novel at the date of the granting of the letters patent, and that it had been anticipated prior to such date. The petition was heard by *Isaacs* J., and the facts and evidence sufficiently appear in his judgment hereunder.

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Nov. 30.

Starke, for the petitioners.

Mann & Macfarlan, for the respondents.

Cur. adv. vult.

ISAACS J. read the following judgment:—The Broken Hill South Silver Mining Company, with the authority of the Attorney-General, petition for revocation of the Commonwealth Patent No. 564 dated 1st June 1904 and granted to N. Guthridge Limited.

The patent is for "Improvements in shaking table ore concentrators," and the grounds relied on for revocation are want of novelty and anticipation. So many different and distinct parts of the apparatus described in the specification are challenged and on grounds involving distinct scientific principles and practical knowledge, that this action is substantially a number of individual cases all requiring separate treatment. The particulars of objection alleged in the first paragraph want of novelty having regard to the common and public knowledge in Victoria. The word "Victoria" was, I have no doubt, a slip for "Australia," and, until the evidence was closed and counsel for the petitioners had proceeded with his address in summing up, the case was conducted on the lines of the first paragraph referring to all Australia, and an amendment was accordingly made. Prior publications are also relied on in the particulars of objections, the first being that contained in "The Engineering and Mining Journal of New York" of 20th June 1903, the second being the specification of the letters patent granted in New South Wales to Messrs. Cammett & Shepherd in 1899, and the third a publication in Victoria of the Cammett table in the "Bulletin of the Denver Engineering Works" dated 1st July 1899.

The invention covered by the patent attacked consists of a concentrating table with undergear for giving it the required inclination, and actuating machinery for transmitting to it the necessary motion. The deck of the table is a plane surface in which channels are constructed. The mechanical method of

constructing the channels is immaterial, and depends on the nature of the substance of which the deck is composed. If that be of wood, there may be grooves hollowed out by any process; if of iron these may be cast or milled, if of rubber they may be moulded in the original manufacture; or, whatever the material, the channels may be formed by strips with tapering bevels, the transverse inclination of the bevel being less on one side of the strip than on the other.

But whatever the process of making these channels may be—whether with strips or grooves, or however the grooves may be fashioned—the channels have a gradual or gentle transverse inclination from the upper or feed side of the table and an abrupt or steep inclination on the discharge or lower side. The channels also widen and deepen longitudinally from the machinery end of the table for a third more or less of their lengths, or substantially the extent of the pulp feed; they may be uniform in depth and width for a short distance, and then finally narrow and shallow progressively for the remainder of their lengths towards the other or discharge end of the table. The groove may extend the whole length of the table, or may terminate at any distance short of the discharge end. The specification, speaking of the surface of the table, says:—"However constructed its characteristic features will consist in concentrating channels, whose cross-sections approximately correspond with the operative cross-section of a prospector's gold-pan, and which shallow and narrow from an intermediate point towards both ends of the table." It then continues in these words:—"On reference to Figures 5 and 18, which show a cross-section of the table, it will be noted that the concentrating channels, taken in respect to the flow of the dressing water transversely of the table, are comprised of a gentle downward incline from the feed side of the table, and an abrupt or steep incline or rise towards the tailings side of the table, the two inclines forming an obtuse angle the bottom of the channel being deeper contiguous to the tailings discharge side of the table, and the same is to be taken as intended by us wherever in this specification we refer to the channels as having the cross-section corresponding with the operative cross-section of the

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prospector's gold pan." The upper channels may be made shallower than the lower ones.

The "middlings'" zone of the table surface is an indefinite but roughly ascertainable part of the table—namely, that portion where, after the heaviest concentrates have found their way into and continue to pass along the channels, the lighter particles of material find themselves on the plane surfaces of the table between the channels. It is towards the forward end and lower side of the table. In this zone and running transversely of the table, and between the channels, are placed a series of what are called adjustable baffle buttons turning as desired upon a pivot, such as a screw, in their centre.

As the table receives a jerking reciprocating movement from the actuating mechanism the material comes forward. As it at the same time obtains, by means of adjusting undergear, a downward inclination from the feed side to the discharge side, the material also receives from the dressing water at the top of the table a downward impulse. The result is a diagonal movement on the plane surface of the table, the channels preserving, to such of their contents as are retained, a purely forward motion. The baffle buttons serve to obstruct the material on the intervening planes in the middlings' zone, and deflect the water and all material in suspension across the channels without any substantial interference with their mineral contents. This process arrests and deflects the material, assists in the separation of the gangue from the values, and also in the classification of the mineral particles themselves.

The undergear consists of a sub-frame supporting the table, and furnished with two track-rods, one at each side of the table, and with guides resting upon these. One of the track-rods, namely, the one at the lower or discharge side, is fixed. The other along the feed side is adjustable that it may be moved up so as to give the table when in operation the desired inclination. The guides support the table upon the track-rods and enable it to move longitudinally in response to the impulse conveyed by the actuating machinery. This consists of a train of mechanism designed to impart a differential reciprocating movement, and may be described as a revolving crank attached to a pitman, the

other end of which is connected with an oscillating crank and another pitman. The latter is again attached to a vibrator or lever of the second order, that is, one in which the fixed point is on the same side of both the power and the work to be done. The specification states that the length of the first pitman will determine the character of movement imparted to the table and that accordingly by lengthening and shortening it, which can be done either by means of an adjustable pitman or by substituting pitmen of different lengths, the character of the movement may be regulated at will. I may here observe that the statement as to the length of the first pitman determining the character of the movement—that is the rate of velocity at a given point—was a mere truism of applied mechanics, and so as to the adjustable pitman or of a pitman of another length to vary the velocity.

There is, as I read the specification, no pretence of invention in this statement, and at all events the evidence shows none could be sustained.

I have now indicated the chief features of the respondents' apparatus, at least so far as they have been relied on as supportable inventions.

The formal claims in the specification may be divided into classes. All but five of the claims relate to a concentrator table having channels from the rear end towards the front end and means for actuating the table substantially as and for the purpose described. These claims differ only in the variation of the claim as to the channels, that is channels which (1) widen towards the end of the table; (2) widen and deepen towards the front of the table; (3) widen progressively and have the cross-section of the operative section of a prospector's gold pan; and (4) widen and deepen progressively towards the end of the table, and have the cross-section of the operative section of prospector's gold pan; (5) narrow from an intermediate point in the length of the table to both ends of table; (6) similarly narrow and shallow; (7) narrow and resemble the gold pan; (8) narrow and shallow and resemble the gold pan; (9) narrow with intervening plane surfaces; (10) narrow and shallow with intervening plane surfaces; (11) narrow, resemble the gold pan, and have intervening plane surfaces; (17) deepen; (18) deepen at an

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intermediate point; (19) deepen toward the front ends; (20) shallow from intermediate points towards both ends; (21) progressively shallow from intermediate points towards both ends; (22) widen towards their front ends; (23) widen and deepen towards their front ends; (24) narrow from intermediate point towards both their ends; (25) narrow and shallow from intermediate point towards both their ends; (26) similarly and resembling gold pan; (27) widen and deepen towards their front ends and resembling gold pan.

Then there are five claims—12, 13, 14, 15 and 16 which expressly claim combination. The first combination is that of a concentrator and baffle buttons in the middlings zone as described; the second, of a concentrator table having intervening plane surfaces and baffle buttons therein; the third, fourth and fifth, concentrator table and the undergear variously differentiated.

It will thus be seen that the claims comprise channels whether made by strips laid on the surface of the table, or by grooves let into the surface, and whether continuing the whole length of the table or not, whether of equal or unequal length, whether the diminution in length is progressive or not, or if they widen or deepen, or both widen or deepen towards the end of the table, or towards their own terminations, or otherwise conform to the multiform descriptions in the various claims.

I do not treat the claims other than those numbered 12, 13, 14, 15 and 16 as claims for combinations. Learned counsel for the petitioners made plain his contention that they were not, but were for the various integers enumerated in the respective claims. Learned counsel for the respondents did not argue to the contrary. No express admission was made, but the whole argument proceeded on the basis that the conformation of the table surface was obtained independently of any combination with the particular mechanism described. Manifestly it would be worthless to the patentee to establish a mere claim for a combination of the particular integers enumerated in the specification. See *per* Lord *Cairns* L.C. in *Harrison* v. *Anderston Foundry Co.* (1). Independently however of all extraneous consideration, I do not think the specifications indicate, except where

(1) 1 App. Cas., 574, at p. 578.

in the claims express mention of combination is made, that any such limitation is intended. In *Clark* v. *Adie* (1) Lord *Hatherley* said:—"You must in some way or other inform those whom you are dealing with, by which I mean the general public—whom you wish to exclude for a certain limited number of years from using your invention—you must inform them, in some mode or other, whether you have subdivided, if I may use the term, your machine into those separate parts and claim for each the merit of novelty, or whether you are simply making a combination of things *per se* old, but which have never been used before in combination, and which make up, as you say, your machine, for which you claim protection as a novel and useful machine, and which machine must not be made by anybody but yourself. If you claim protection also for a portion of the machine you must make it plain, I do not say necessarily by word, or by any particular mode, but, in some definite mode or other, you must point out what is the combination of parts which you ask to have protected, and what are the subordinate parts which also you ask singly and respectively in themselves to have protected."

Now I have looked at the specification apart from the claims, and read it with a view to see what is really claimed as the invention, because it may appear from the specification even without a distinct claim in so many words that the invention substantially claimed is for a combination: *Lister* v. *Leather* (2), and *Harrison* v. *Anderston Foundry Co.* (3). I have read it so as to ascertain its fair meaning according to ordinary principles of construction, not leaning either to a benign or a strict interpretation of its language.

I find that it begins with the statement that it relates to a certain class of reciprocating concentrator tables described. The objects are defined to be (1) facilitating the stratification of the pulp constituents, and the rapid settling of the finer values at the feed end and relieving the table of part of the load of dressing water at that point; for this purpose the channels are deepened and widened as indicated; (2) the gradual approach of the concentrates to the plane of the table in moving forward so as

(1) 2 App. Cas., 315, at p. 328. (2) 8 El. & Bl., 1004, at p. 1034.
(3) 1 App. Cas., 574.

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to keep the channels filled and give a plane surface for the operation of the dressing water—and to this end, the channels are shallower and narrowed as described; (3) reduction of the amount of middlings which pass over the forward end of the table and so increase the capacity of the table. For this purpose baffle buttons are introduced. Then is added the statement of other features of invention enumerated, viz., depth, length and arrangement of the channels, and the construction and arrangement of the undergear, "all as will be hereinafter more fully pointed out and finally summed up in the claims."

The specification then proceeds, "We will now proceed to describe our invention more fully," &c. Then, "Figure 1 is a top or plan view of a concentrator table embodying *our invention*, together with the pulp feeder and the mechanism for reciprocating the table."

Subsequently there is a complete statement of the working of the table, a detailed description of the channels, and baffle buttons, of the well-known "Spitz Kasten," used for grading the pulp, and the reciprocating mechanism with the manner of its operation, and finally the claims are set out.

I take the first as a sample.

"A concentrator table having channels which widen from the rear end of the table towards the front end thereof, and means for actuating the table, substantially as and for the purposes specified."

I do not consider that the patentees intended to claim a mere combination of the particular integers described. They certainly wanted a monopoly of the particular deck of the table, however the reciprocating motion was transmitted; and it would be not only useless to them to tie them down to a mere combination of the particular deck, undergear and mechanism described in the specification, but it would be extremely embarrassing to the public to permit a claim for a combination only to be couched in such terms as I have read. The inference against combination is strengthened by the special reference to it in claims 12 to 16, and the subsequent dropping of the term. In one sense, some of the claims are in substance for a combination. For instance, claim 11, apart from the reference to the means for actuating the

table, describes the channels in a way which combines longitudinal narrowing and a certain cross-section, together with separation by intervening plane surfaces. The description of the channels in that claim is one which would not be satisfied except by the concurrence of all the conditions. But that is different from a mere combination of such a table and such actuating machinery, leaving the patentee at the mercy of anyone who chooses to use each separately with other apparatus. I therefore proceed to consider the validity of the claims as applied to the separate integers.

There are some of these that may conveniently be first disposed of. The undergear, as to the mechanism for altering the inclination of the table, is admitted by Mr. Coane for the respondents to be a mere mechanical equivalent for the corresponding undergear previously used for the Wilfley table, and embodying common knowledge. The portion adapted to carrying and guiding the table is, however, said by him to be different because, as it is claimed, the track-rod gives the greater bearing space, and affords a greater probability of steady horizontal movement without jerking; nothing more. It is also the opinion of one of the expert witnesses for the petitioners, Mr. Bernhard Smith, that the respondents' appliance is more conducive to smooth running by lessening the liability to vertical jigging, and that, on the whole, under the best circumstances the track-rods would give slightly smoother running. But Mr. B. Smith is nevertheless of opinion that the track-rods and guides were perfectly well known expedients for the purpose employed in the Card table long before 1904, and regards them as mechanical equivalents for the Wilfley contrivance—both permitting the longitudinal motion freely, preventing lateral motion, and neither effecting any other object. Mr. Anderson states that mechanically the two appliances are equivalent, the respondents' being the more ordinary and simple mechanism of the two, that is, it is more commonly used in general mechanical contrivances. He adds that for at least 30 years engineers commonly knew that one contrivance could be used in place of the other for all purposes. He is also of opinion that as regards smooth running the advantage is on the side of the Wilfley roller system. Mr.

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Mitchell is equally clear that the two sets of undergear are mechanical equivalents, their functions being the same in every respect, and that prior to 1904 track-rods and guides as in respondents' undergear were actually used as substitutes or mechanical equivalents for the Wilfley roller bearings, and *vice versâ*.

I have no doubt that the Card undergear possessed no novelty whatever at the date of the patent, that it had for many years been common knowledge—it was a mechanical equivalent of the Wilfley corresponding appliance—and that there is, so far as I can form any opinion, no appreciable difference in smoothness of running between the two.

I next come to the actuating mechanism. This is asserted by the petitioners to be old. It is said to have been a matter of common knowledge long before the date of the patent that differential reciprocating motion could be transmitted by the very means adopted, and further as a proof of the main fact the Wilfley corresponding train of mechanism is exhibited. That bears a remarkable resemblance to the Card mechanism at nearly every point. It also consists of a revolving crank attached to a pitman the other end of which is connected with an oscillating crank and another pitman. The second pitman as in the Card machine is at its other extremity attached to a lever. This lever is of the first order, that is, one in which the fixed point is in the centre between the work to be done and the power actuating the lever. As pointed out by Mr. Anderson, whose evidence I adopt, that makes no difference whatever, except such as would exist if one man were to saw wood directly below him and another were to saw wood directly above him.

Mr. Coane, the respondents' expert engineering witness, admitted that each had both a revolving crank and an oscillating crank. There were two differences claimed by the respondents to exist between the two sets of mechanism. The reference in the specification to an adjustable pitman was one. I have already expressed my view generally that this was nothing new, but may here add that in cross-examination Mr. Coane stated that in general mechanical contrivances adjustable pitmen are commonly known among engineers as a means of altering velocity, and that

was known all his time. He stated, too, that he had never seen anything like an adjustable pitman in varying differential motion in the case of concentrating tables. To that, however, I attach no importance. Differential motion was an old function even as applied to concentrating tables long before the date of the patent. Beyond doubt an adjustable pitman was an old device in connection with differential motion. The use of it for the present purpose involved no ingenuity. The patentee simply drew on the common stock of knowledge. The other suggested difference consisted, as stated by Mr. Coane, in the different direction of the second pitman—which he called, in the Wilfley machine, the second toggle bar—from that of the second pitman in the respondents' machine, where he styled it a connecting rod. In the latter it is almost at right angles to the oscillating crank, in the former almost in the same line. The result, he said, was a difference in movement, the movement in the respondents' case decreasing more suddenly than in the Wilfley. That, said Mr. Coane, is the result, by which he meant the necessary result, of any toggle joint. A toggle joint is simply a joint with two moveable struts. He says there is necessarily a difference in the angles between the oscillating cranks and the respective pitmen, which are attached to them and connected with the lever. This gives rise to a difference in speed, and for that reason he would not call the one apparatus a mechanical equivalent for the other. He verbally differentiates between the movements thus: In the Wilfley there is first a slow movement forward, then accelerated, then it stops. Then a start back with accelerating velocity, then retardation more slowly, and finally a stop. In the Card machine, first slowly forward, then acceleration, and a sharp dying away to stop; a start back with rapid acceleration and gradual retardation till the stop. He adds, the character is the same but the velocity is different. There can be no doubt that in each case there is a bumping action, with a differential velocity. To me he said that, so long as the style of mechanism adopted by Wilfley is used, he did not think it possible to get the same curves of velocity as those produced by the Card, nor curves so nearly resembling them as to be indistinguishable by measurement. He finally says—You want in these tables a sudden stop and a quick

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return, and you get it in the respondents' case, but not with the Wilfley. On the face of this evidence there appears to be some substance in the distinction between the two trains of mechanism. But the evidence of the engineers called for the petitioners in my opinion completely answered any difficulty occasioned by it. Summing up the result of the testimony of Mr. Bernhard Smith and Mr. Anderson (Mr. Mitchell had left Melbourne before Mr. Coane's opinion was given and was unobtainable) the situation appears to be this. There is a theoretical difference in the rate of velocity at a given point between the two types of mechanism. That difference can be brought down to within two or three per cent., and to no nearer approximation. In other words, as stated by Mr. Bernhard Smith, if at any given point of the revolution the Wilfley velocity were 3 feet per second, the Card velocity might be 3 feet and a $\frac{1}{4}$ of an inch. You could so arrange the parts as to make the greater speed to that extent fall on the side of the Wilfley. But although theoretically there would always be this slight difference, arising from the non-identity of the precise position of the two oscillating cranks, it would, in any case, be utterly negligible as a practical matter. It would be almost imperceptible. Even an expert engineer would have difficulty in determining it. But beyond that, the unavoidable imperfection of practical mechanical construction, and the necessary play in the joints and attachments of the parts, utterly destroys the theoretical precision of the difference in the positions of the oscillating cranks. A machine must have a play of 1-64th part of an inch in the different joints to permit of lubrication, and thus whatever theoretical difference exists is lost in practice. The two sets of mechanism I regard as substantially identical. In ingredients, arrangement, and functions, purpose. and result they are in substance the same. Apart from comparison between them, the evidence entirely satisfied me that the respondents' device was not novel. Mr. Coane certainly expresses the opinion that without invention an engineer would not previously have thought of adopting the oscillating crank in the Card mechanism. But the weight of opinion, as I am able to gather it, is the other way. Both Mr. Bernhard Smith and Mr. Anderson are emphatic that the respondents' device, like the

Wilfley mechanism, was commonly known to engineers as applicable, and was applied, for the purpose of imparting differential motion. Mr. Smith was clear that before 1904, according to the common knowledge of engineers, it would have required no invention to substitute an ordinary oscillating crank for the toggle joint; and Mr. Anderson said that the Card device was, before 1904, the identical mechanism most used for getting differential motion in the way imparted by it, and was, in his opinion, a more obvious means of obtaining it than the Wilfley type. Mr. Rigby supported Smith and Anderson as to the practical identity of the two mechanisms, and the previous knowledge of the respondents' device. I find as a matter of fact, therefore, both as to the undergear and the actuating mechanism, they were in no way novel, presenting no new feature in design, construction, purpose, function, or result, and were part of the ordinary knowledge of mechanical engineers, and of other persons engaged in the art of concentrating ores.

This brings me to the only remaining branch contested—namely, the surface of the table. The petitioners, as I have stated as to this branch of the case, attacked the novelty of the invention with two weapons — common knowledge and specific anticipation.

I shall deal first with the point as to anticipation. What is really relied on for this purpose is an illustrated article in the "Engineering and Mining Journal" of 20th June 1903, published in New York. It is admitted that a copy of this issue, the one exhibited in evidence, was received at the Public Library, Melbourne, on 21st July 1903, and was open to public inspection on and from that date. Another copy was a month or six weeks after the date of publication received in Melbourne by the Secretary of the Austral Otis Company and put in the company's library for the use of its employés. It was conceded at the trial on behalf of the respondents that this publication discloses all the essential features of the deck or upper surface of the table, except that which consists in the peculiar shape of the grooves, cross-sectionally, and except the feature which consists in the position and function, of the baffle buttons. The admission was accompanied with the intimation that it did not extend

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to admitting that the matter so disclosed had become common knowledge before April 1904. It will be convenient to dispose first of the baffle buttons. Mr. Grainger, an engineer in respondents' employment, stated that he saw a Phœnix-Weir concentrating table at work at Bendigo before 1904. The table had a cleated surface. At the discharge end there were some small cleats or baffles. There were more than one, and according to the rough illustration presented in cross-examination to the witness by learned counsel, by means of the three pen handles placed on the model of the Wilfley table marked No. 22, and assented to by witness, it appears there were three such cleats. Mr. Grainger said they were not necessarily parallel, and could be of any size, and arrested the flow of water. This evidence was not to support any case of anticipation, but was only on the question of common knowledge as to baffles. The witness distinguished between those and the Card baffle buttons, on the ground that, as on the plane surface of the Phœnix-Weir where the baffles were there was no considerable quantity of concentrates, the purpose served was different from that for which the Card baffles were used, the latter being placed nearer the bottom end. He, however, admits that he has never seen the baffle buttons in actual operation. He further states what seems to me of some importance, viz.: that he has seen the Card tables in recent years—which goes without saying as he is engaged in selling them—and he states they do not in practice use these baffle buttons. The operator, he adds, may, if he likes, put a bit of a cleat there. I should gather from his evidence that there is not much difference between the cleats in the Phœnix-Weir and those which the operator may put in if he likes, and that little if any consequence is attached by the respondents to the baffle buttons on the table.

But further being shown the well known text book and standard authority, *Benjamin on Modern Mechanism* (1892), and which was in 1892 to 1894 a text book for students at the Melbourne University, Mr. Grainger stated that the description of the baffle buttons on page 593 shows substantially the same thing as the baffle buttons on the Card table and answers the same purpose. The mere fact that they are separate between

the channels is nothing to the point, because no useful purpose whatever, however small, has been shown to be served by turning the various buttons at diverse angles of inclination with regard to each other, and the specification as well as the evidence discloses the fact that the channels will run full between the baffle buttons. The result of Mr. Kay's opinion in cross-examination as to this is that they cause no appreciable difference in working operations from a single cleat. Now the affirmative evidence as to baffles being a well known expedient is very strong. A picture of a Rittenger table—the parent of this type—was shown to me in a book, and it appeared that there were two short cleats on the tailings discharge side, with pointed ends, and affixed to the table by means of a pivotal screw by which the operator was able to turn the cleat or baffle to any angle he desired. Different kinds and qualities of ore require variation in the inclination of the table, which affects the flow of the water and material, and consequently the inclination of the baffle where that is used. Now, *Benjamin*, at the page mentioned, in speaking of the Rittenger table, after describing the bumping motion imparted to it, says:—"The effect of the double force exerted by the downward current of water and jar at right angles thereto is to make the heavier particles take a diagonal course, and by a few adjustable buttons on the lower end of the table, a separation according to specific gravity is brought about, the heaviest particles moving farther across than the lighter." It appears then that it was well known in and since 1892 in Australia that adjustable buttons might, at the discretion and according to the skill of the operator, be placed at some convenient place on the lower end of the table to do exactly what the Card baffle buttons do. Mr. Rigby supports that also from his own observation, not of the Rittenger table, because it does not appear there was ever one in Australia, having been long supplanted by other types, but he has seen such baffles in the Phœnix-Weir which were always supplied with the table.

On the whole, baffle buttons, both in name and substance, were not novel, but were familiar to persons engaged in concentrating operations, and no advantage or utility whatever is obtained by placing them across the grooves. It is, in my opinion, not

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invention, or choice, or preference that dictates their position over the channels, but it simply necessarily happens where the channels go to the full length of the table. If the channels terminated diagonally, so as to leave an extensive plane surface similar to that on the Wilfley table, the baffle buttons would almost as a matter of course even on the Card table be placed on the plane surface. There was no inventive faculty exercised with regard to the baffle buttons, and, as shown by Grainger's evidence, their supply has been discontinued by the respondents in later years.

The only other contest, and this was the main contest, as to the article in the New York journal is whether it anticipates the shape of the channels in their cross-section; in other words, the petitioners allege, and the respondents deny, that it sufficiently indicates that the channels have a gentle slope on the upper side and an abrupt slope on the lower side. Now, the first thing to be considered is, what does the law regard as a sufficient anticipation. That is definitely settled by *Wilfley Ore Concentrator Syndicate Limited* v. *N. Guthridge Limited* (1), in which the Privy Council affirmed the law as laid down by this Court, following a previous case in the House of Lords. If the alleged anticipation conveys to men of science and employers of labour information which will enable them without any exercise of inventive ingenuity to understand the invention, and to give a workman a specific direction necessary to practise it, that is a sufficient anticipation of the invention. And the question is whether this article, fairly read, gives the requisite information. It is not necessary to find the identical language of the respondents' specification, or even to find actual words, but if the information is reasonably to be gathered from the document by persons of the description mentioned by Lord *Watson* it is enough. It must be assumed such a reader brings a willing mind to the task of interpreting the document, and learning all it has to impart, and calls in aid all the knowledge and experience commonly enjoyed by persons conversant with the art up to the stage to which it has advanced. If in those circumstances, and if such a person, as *Lindley* L.J. said in *Savage* v. *D. B.*

(1) (1906) A.C., 548.

Harris & Sons (1), "reflects upon it and thinks about it and grasps it," and can thereby without independent inventive ingenuity understand the invention in question, and either give the necessary instruction to put it in operation or do so himself, the invention is anticipated. Taking the hypothetical reader of the class predicated by Lord *Watson*, he would start with the knowledge that for some years concentrating tables had been in use. The smooth Rittenger had been replaced by the riffled Wilfley and Phœnix-Weir, the cleats of which acted as effective retainers of the particles. As *Richards* says at p. 679, "Tables with riffles have the advantage" [that is over smooth tables] "that the weaker grains of concentrates which fail to be retained in the upper riffles find in the lower riffles a place where the pulp is more loose and soft, so that they are relatively stronger than their neighbours, and can therefore be retained and conveyed either into the heads or the middlings." Retention is, of course, essential. Mr. Brookes said that the Wilfley riffles were practically rectangular. The assumed reader would also know that among the various other tables in existence there was the Hallett, which could be made with the riffles as depressions in a plane board surface, or, in other words, grooves. There was also the Krupp-Ferraris table which had grooves, but as these require separate mention I defer further reference to them. There was the Cammett, a grooved table, the grooves running down the whole length of the table. The shape of these grooves was rectangular, and they were several times broader than deep. These therefore were abrupt on both sides. The Bartlett table had V-shaped channels, by which I understand channels abrupt on both sides, but not so abrupt as those of the Cammett. The precise angle is undefined, but it was, I apprehend, acute. Mr. Rigby by Exhibit 20 makes it substantially rectangular, but *Richards* is more likely to be exact.

There was also the Woodbury table with grooves running from end to end, and in shape angular like the teeth of a saw—similar to the Bartlett, as Mr. Rigby says. These grooves were at intervals replaced by cleats so that it had a compound surface. There was also the Buss table with channels of a rectangular

(1) 13 R.P.C., 364, at p. 369.

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cross-section and several times wider than deep. All these tables were, I am satisfied, more or less well known to persons engaged in concentrating operations in Australia, and were, before the patent applied for, part of the common stock of knowledge. In none of them was the lower side of the channel so sloped as to have what any one could call a gentle slope. As already mentioned, I am not including here any reference to the Krupp-Ferraris. I may say I attach no importance in this connection to the Robinson riffles, original or modified, because they are for sluices, and there is no comparison, in my opinion, to be made between the sluice and the concentrating table as to the point we are now considering.

Now, what would an ordinary skilful operator of a concentrating table, starting to read the New York article, have in his mind as to the inclination of the lower side of the channel? Obviously that its first and chief duty is to catch and retain the valuable particles that reach the channel; the depth of the channel is another matter, and when the channel is full and the plane surface to all intents and purposes re-established, the groove ceases to act as a channel. But the angle of inclination must of necessity in the eye of any practical man be sufficiently abrupt to do the work of catching and holding. Mr. Sharpe was one of the expert witnesses called for the respondents. He is in the respondents' employ at Sydney. He is a concentrating engineer, and has had considerable experience in working concentrating tables in Victoria, New South Wales (Broken Hill) and Tasmania. His experience extends over 15 or 16 years. He said in re-examination:—"A workman would never in actual operation so incline the table as to make the upper and lower slopes of the channel at the same angle from the horizontal, or the lower angle less." And why? Obviously because under the known conditions and requirements of the art such a thing would be on its face prejudicial to the result, and so outside the pale of practical consideration. That is a truth that goes without saying. Armed with this knowledge and experience how would the article in the "Engineering and Mining Journal" appeal to the skilled reader? He would find three distinct statements of fact as to the traverse shape of the channels. (1) The cross-

section of these channels has the same obtuse angled bottom as the lower operative corner of a miner's pan when in use. (2) The finest mineral particles settle very readily to the lower corners of the pan-shaped channels. (3) The strata, overlying the longitudinal planes between the channels, are so shallow that the finely pulverised mineral easily reaches the bottom, follows the gentle slopes of the upper sides of the channels down into the lowermost corners, and there remains until discharged over the head of the table.

In addition to the verbal description there is an illustration, to which I shall refer presently.

Now everyone knows what a miner's pan is. One was put in and marked A.

Express evidence was given as to its method of use, and what is its lower operative corner. That evidence took a form which makes it proper to be taken into my full consideration. I therefore give to it its just place and weight in arriving at my conclusions, regarding it as not in any way trenching on the province of the Court in construing the document, but explaining the meaning of terms the full significance of which is only understood by persons experienced in the particular vocation of gold-mining.

Taking the first extract, the angle of the channel is fixed. It is obtuse, and to the same extent as that formed by the bottom and sides of a miner's pan. But not only that, it is indicated by the words "in use"—that in order to properly appreciate the meaning of the article you must hold the pan sloping downwards as if using it. That means that the bottom of the pan corresponds to the upper slope of the channel, and the phrase "lower operative corner" of the pan shows that the bottom portion of the side of the pan corresponds to the lower side of the table channel. The respondents' counsel says that only gives you the angle formed by the two sides of the channel and the fact of a downward general inclination of the channel as a whole; and he adds that it is quite consistent with all that there appears that the lower slope of the channel would run downwards like the side of the dish at the moment when the last drop of water was ejected from the pan, leaving the gold behind—in other

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words, with the outer lip of the pan forming the very lowest part of the whole dish. That, to my mind, would not be reasonable, considering the person who is supposed to be reading the article and the declared purpose of the operation intended to be described. Mr. Sharpe's evidence is quite in point, and is an answer to the suggestion of counsel.

But then we come to the second extract. The finest particles settle very readily to the lower corner of the pan-shaped channels. Apart from the natural impossibility of such a result on the hypothesis suggested, there we find a clear statement as to the "lower corners" of the channels. No one could imagine that the table is to be tipped up to the extent of a pan to eject the dross or the water, and the words "lower corners" show that the point of junction of the two sides of the channel, that is the corner, is always the *lower* part of the channel. The language is not that of mathematical precision, but its effect is not difficult to gather by reasonable men acquainted with the subject matter.

Then comes the third extract. Remembering that the angle is obtuse, that the model suggested is a miner's pan, that the particles readily settle on the bottom corners, that throughout by far the greatest part of the operation of the miner's pan, especially when engaged, as the channels are, in merely stratifying the material as distinguished from ejecting the refuse—for the stratification process is the only relevant portion of the operation of the miner's pan—the lower side would be so inclined as to carefully prevent escape of any material, and recollecting, too, that no concentrator in his senses would dream of so depressing the lower side of the channel as to facilitate the escape of valuable mineral, the reader of the article would see it stated that the upper sides of the channels had gentle slopes, and down these slopes the finely pulverized material descends into the "*lowermost corner*"—emphasizing the fact that the apex of the angle is the nearest point to the ground—and that the material there "remains" until discharged at the head of the table. It requires no invention to see that the suggested arrangement of a descending slope from the corner to the outer edge of the lower slope, or even a slope so gentle as to prevent retention, is utterly incon-

sistent with common knowledge with the declared purpose to be attained and with the words of the article itself.

Besides, looking at the illustration as a help to the understanding which it is intended to be, and examining it as I have done with an ordinary magnifying glass, it appears to me antagonistic to any notion of a gentle slope on the lower side. That had never been done: it would have been contrary to good practice, and I think anyone cognizant of the subject would have instantly rejected the notion.

I entertain no doubt the conditions stated by Lord *Watson* are fulfilled by the alleged anticipation, which I therefore consider sustained. I do not stop to deal with the other two alleged anticipations. They do not go so far on this point, and the rest is immaterial.

There is yet a line of attack with regard to these channels on the ground of common knowledge. This has caused me very serious consideration. The burden of establishing it rests on the petitioners. The case for the petitioners rests chiefly on the testimony of Mr. Rigby, who is undoubtedly, in his representative character, an interested witness. On the other hand, Mr. Grainger and Mr. Sharpe are in the respondents' employ, and stand somewhat in the same position.

Mr. Rigby says that in 1902 and 1903 he saw as many as 20 Krupp tables in use in various parts of Australia. I disregard the catalogue. I am not sure when that document Exhibit 12 was obtained. It bears the stamp of Noyes Bros., who were not called, and it appears in the evidence of Mr. Sharpe that Noyes Bros. have only been agents for the Krupp tables for the last three and a-half years. The shape of the grooves cross-sectionally Mr. Rigby indicated by a drawing (No. 14). This shows grooves having obtuse angles and with a gentle slope on the upper side and an abrupt one on the lower side. He says there were two or three working at Broken Hill in the Block 10 Mine and one in the Proprietary Mine, and adds that he last saw one working a few months ago at Broken Hill, and that the angle formed by the two sides of the groove meeting at the bottom is very near a right angle. He denies positively that the table in the Proprietary Mine had the grooves reversed—that is, the long slope

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below and the steep slope above. Mr. Brunell Kay, a mechanical engineer of twenty years' experience generally and twelve years' experience in concentrating tables, speaks of a Krupp-Ferraris table in the Lake View Consols Mine, Kalgoorlie, in 1903. The time would, I think, probably be from April to June of that year when he first saw it. He had while chief engineer ordered the table as an experiment, and he left in the first half of the year before the arrival of the table, which was after Mr. Bigelow became manager. He was, however, employed by the management occasionally as consulting engineer, and from time to time saw the table at work. He describes the deck minutely, and shows by a sketch (No. 15) the cross-section of the channel. He supports Mr. Rigby. Mr. Bigelow, who was called at a late stage, was in 1903 and 1904 the general manager, and also in charge of the mining operations at the Lake View Consols Mine. He describes the deck of the Krupp table differently from Kay as to the length and longitudinal arrangement of the grooves. But as to the cross-section he says:—"The grooves were angular sections. They were V grooves, inclining with a greater angle from the plane of the table on the lower side of the grooves—that is, the tailings discharge side. The grooves were V-shaped, with one long leg, having the long leg on the upper side, having there a less angle from the horizontal."

Both Kay and Bigelow are independent witnesses and, I think, gave their evidence honestly to the best of their recollection. On the other side Mr. Grainger stated that he visited the petitioners' mine six or seven weeks ago, and saw a table which he says is a Krupp-Ferraris table. This was the first time he ever saw a grooved concentrating table except his employers' tables. He went to the mine to try and sell a Card table. Mr. Wainwright, the general manager for the petitioners at Broken Hill, went through the mine with him. They discussed the table. He saw twenty or thirty tables and examined six to twelve, apparently the grooved ones. He had no idea then of this dispute between the present parties, but as the cross-section was discussed, and because he had a certain previous impression, he examined the grooves in the table he identifies as a Krupp-Ferraris. He describes a table of which the deck had grooves running from end

to end of the table. In this he agrees with Bigelow's description and differs from Kay and Rigby.

He is unable to say if they tapered at the discharge end. He says they were angular in shape, the upper side, that is the side that is nearest the feed, was comparatively short and steep, while the lower side or side furthest from the feed was a more gentle slope. He adds that there were no plane surfaces between the grooves so far as he remembers. Mr. Sharpe, already mentioned, says in March 1907 he saw at the petitioners' mine a table which is generally known among mining men as the Krupp machine. He drew a cross section (Ex. B) corresponding with Grainger's descripiion—both in slope of grooves and the absence of intervening plane surfaces.

There is apparently no mention of the Krupp machine in any literature. Mr. Grainger cannot say whether he saw a description or heard a description before April 1904. He thinks he first read a description of it two or three or four years ago, and cannot speak more definitely, and cannot even say where he read that. Mr. Jaques had no knowledge until within the last three years. He said he had seen a Krupp table at the Victoria Cornish Mine, but could not describe the cross-section of the grooves. Sharpe did not know of it being used in Australia before 1904. All this is negative evidence; but Kay and Bigelow certainly did see such a table, and unless Rigby is either dishonest or utterly mistaken, the Krupp table was so far extensively known that at least twenty mines had it, and twenty mining managers and all their assistants, and probably others, were familiar with them before 1904, and as far back as 1902. Except, too, he is either wilfully wrong or unintentionally in error, the Krupp table had the essential features of gentle slope on the upper side and sharper slope on the lower side. I take into account his interest in this matter and I do not believe he was intentionally giving false testimony. I think he was quite honest. I say the same of all the witnesses. They impressed me as stating what they believed to be true. But if Rigby is honest he can hardly be mistaken, it was his business to know the various tables. The conversations he had with mining managers were likely to specially impress him with the points of difference, and I am unable to reject his

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testimony as to the relative inclination of the sides of the Krupp channels. He is, as I have said, corroborated by two independent witnesses who had strong reason for observing the cross-section of the grooves. Mr. Bigelow said, indeed, that the cross-section was the important part of the concentrating table and was the distinguishing feature of the Krupp table. It may be that Krupp tables differ as to length of grooves and as to cross-sections. Perhaps they do, I cannot tell. But I conclude that prior to 1904 there were a large number of Krupp tables in Australia at work, and well known, in which the grooves were obtuse angled, the upper side with a gentle slope, and the lower with a slope more abrupt, and I find the issue of common knowledge as to this against the respondents.

As to some other elements of the respondents' table—namely, the deepening, narrowing, and shoaling of the channels, and as to the cleats—as to the lengths uniform or variable of the channels—as to intervening plane surfaces—in fact, all but widening—I do not understand that it is now contested these were all common knowledge. They were certainly admitted to be anticipated, and, in the absence of admission, the anticipation is clear. It is not necessary to pursue these features further. Nothing was said on either side at the trial as to construction of these elements.

So far I have dealt with the claims upon the separate integer construction. I think that is most favourable to the respondents from a practical standpoint, because the mere claim for the total combination would be useless. But if the claim be one for a combination, then I still conclude, as I do in the cases where combination is expressly claimed, that there is no novelty. The combined apparatus accomplishes no new result, and produces no new product. It is a mere aggregation of old elements, performing old functions, and effecting old results, and, therefore, on the principles I stated in *Moore and Hesketh* v. *Phillips* (1), I am of opinion the various combinations, even if claimed as such, were not patentable.

There is one matter I should notice, although in view of my findings already stated it is immaterial. The petitioners urge

(1) 4 C.L.R., 1411, at pp. 1425 *et seq.*

that the cross-sectional shape of the channels in respect of an abrupt slope on the lower side makes no difference. They place confidence on the ground that the inclination of that slope cannot affect concentration. In one sense that is true, because, however gentle the lower slope, as long as the particles get there stratification takes place, and they will move progressively forward unless forced out laterally. But still I am not persuaded that a rectangular front, for instance, will not retain the particles better against the force of the transverse current of water than a very gentle slope. Depth of channels may counteract this, but that is another matter. There must always be sufficient force in the dressing water to carry away gangue on the plain surface, and this must naturally to some extent influence the particles in the channels. Mr. Kay says, speaking of stratification, "If the slopes were reversed the effect would not be the same in practical working. The water flowing down the abrupt slope would wash the stratified material up the gentler slope. The result of the stratification would to that extent be not so effective." My own opinion is that his view is right, and I accept it. These observations only bear on the question of consideration for the patent in respect of utility as bearing on novelty—so far as relates to the cross-section of the channels, and if all other objections were removed.

I give judgment that the letters patent be revoked.

Solicitors, for the petitioners, *Waters & Crespin.*

Solicitors, for the respondents, *Blake & Riggall.*

B. L.