1938

Sept. 9.

1939

Feb. 25.

BETWEEN:

J. K. SMIT & SONS INC.....PLAINTIFF;

AND

RICHARD S. McCLINTOCK.....DEFENDANT.

Patent—Infringement—Subject-matter—Equivalency—Invention.

Defendant's patent, no. 368,042, relates to a Method and Mold for setting diamond-cutters in core bits, tools and devices as in rotary drill-bits for earth boring.

Plaintiff is engaged in the business of selling diamonds for industrial purposes, and in connection therewith manufactures a machine for casting diamond core bits.

Plaintiff seeks a declaration that the machine, manufactured by it, and the sale and use thereof in Canada, do not constitute an infringement of defendant's patent. The validity of defendant's patent is not questioned.

The Court found that the structure of the plaintiff and that of the defendant perform the same functions and are governed by substantially the same structural law; that that of the plaintiff is a mere equivalent and did not require an inventive step.

Held: That the plaintiff has taken the substance of defendant's invention and any difference in the arrangement of parts, the material employed, or the order of the different steps in the manufacture, are diversities of form and not diversities of substance.

2. That the taking of two steps to accomplish what patentee does in one step does not void an invention, unless the former represents an entirely different conception of means and method for securing the same end.

ACTION by plaintiffs seeking a declaration that a machine manufactured and sold by it does not infringe defendant's Canadian Patent no. 368,042.

The action was tried before the Honourable Mr. Justice Maclean, President of the Court, at Ottawa.

R. S. Smart, K.C. for plaintiff.

E. G. Gowling and *J. C. Osborne* for defendant.

The facts and questions of law raised are stated in the reasons for judgment.

THE PRESIDENT, now (February 25, 1939) delivered the following judgment:

The defendant is the owner of Letters Patent no. 368,042, granted in August, 1937, on the application of one Richard S. McClintock, and which relates to a Method and Mold for setting diamond-cutters in core bits, tools and devices, as for instance in rotary drill-bits for earth boring. A core bit is a hollow cylindrical boring bit for cutting out a core

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in earth boring or rock drilling. The plaintiff is engaged in the business of selling diamonds for industrial purposes, and in connection therewith manufactures a machine for casting diamond core bits. The plaintiff alleges that it has imported into Canada certain of its machines, and it wishes to import others for sale to diamond drill contractors who may wish to use the same for the purpose of setting diamonds in the core bits of diamond drills, and this action is brought for the purpose of securing a declaration that the plaintiff's machine, and its sale and use in Canada, does not constitute an infringement of the defendant's patent. The validity of the defendant's patent is not attacked.

The defendant pleads that the plaintiff's machine, and its use in the manner described in an exhibit accompanying the plaintiff's statement of claim, would constitute an infringement of claims 1 and 4 of his patent. Claims 1 and 4 are as follows:

(1) The method of setting diamonds in a molded casting which consists in seating the diamonds to be set in a pattern holder, supporting the diamond holder in the mold and applying suction of air to the diamonds while in their seats before and during the process of molding the casting.

(4) The method of setting diamonds in a tool which consists in seating the diamonds in a mold, applying air suction to the diamonds to hold them in situ, and pouring molten metal in the mold to envelop portions of the diamonds.

Three paragraphs of the specification of the defendant's patent will reveal in broad terms the invention that is there claimed and its object. They are the following:

My present invention relates to an improved METHOD AND MOLD FOR SETTING DIAMONDS which while applicable for use in a variety of industries, is especially designed for setting diamond-cutters in tools and devices, as for instance in rotary drill-bits for earth boring. Heretofore the common practice for setting diamonds, as cutters in industrial tools, has centred around the comparatively difficult, tedious, and therefore extremely expensive method of first drilling depressions in the face of the tool and then setting diamonds in the depressions and forming facets from the surrounding material by means of punches and mauls, to retain the diamonds. This old method of hand setting permits the selection of desired faces to be exposed, after the diamonds are set, but it is expensive and inefficient and necessitates the use of comparatively large and more expensive stones.

Various other methods have been employed for setting the diamonds in the tools, which use plastics for temporarily holding the diamonds in proper position in a mold, and then, through the application of heat and pressure upon a powdered metal confined within the limits of the mold, a cutting tool is produced. An obvious disadvantage of this method is that the diamonds are not firmly held in their seats, and therefore a high percentage in loss of diamonds occurs when the bit is used.

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In carrying out my invention, I employ a pattern-holder for the diamonds in which they are initially seated, and after the pattern-holder has been located in the mold, I utilize a vacuum chamber in the mold and air-suction to retain the diamonds in their respective seats in the holder during the process of arranging the diamonds in the best chosen pattern and during the pouring of the molten metal for the formation of the tool. In this manner the diamonds are retained in their proper positions against dislodgment during arranging period and against "floating" and they are set with accuracy and firmly retained against loss during subsequent use.

McClintock's "Method and Mold" for setting diamond-cutters in a drilling tool I shall now attempt to describe briefly, but avoiding reference so far as possible to the combinations and arrangements of parts of the structure which he describes in his specification, and which are exemplified in the accompanying drawings. He starts with what he calls a pattern plate, a mica disk with a round central aperture, in which a predetermined number of small holes have been made, around the circumference and inwards towards the central aperture. Diamonds are manually placed in these holes, and they protrude slightly through the mica on the other side, and that side eventually becomes the cutting end of the core bit. The pattern plate is then set on top of a perforated die plate which is located in the bottom of the mold in which the core bit is to be cast, and below which is a vacuum chamber. Air-suction is then applied upon the diamonds in the pattern plate through the vacuum chamber and the perforated die plate, which air-suction holds the diamonds in their respective seats in the pattern plate, and avoids what is called "floating" during the operation of pouring the molten metal into the mold and around the diamonds, in casting the core bit or cutting tool. The molten metal is poured into the mold from a vertical chamber above the pattern plate, and by gravity it falls around and over the pattern plate, enveloping a portion of the diamonds which become embedded in the metal; the remaining portion of the diamonds which protrude therefrom forms the cutting end of the tool. When sufficient of the molten metal has reached the diamonds to hold them in place the air-suction is discontinued, and when the required amount of metal has flown down to form the desired length of the core bit the same is then completed, except for some machining operations which need not be explained. The mica disappears owing to the

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heat of the metal. The vacuum chamber and the application of air-suction, for the purpose of retaining the diamonds in place in the pattern plate until the molten metal effectively holds the diamonds in place, is the substance of the invention of McClintock. And he does this in the one combination or arrangement of parts which constitute his complete mechanism.

The plaintiff's machine, which I shall endeavour to describe, is primarily designed for the casting of diamond core bits, that is to say, core bits in which the cutting stones or commercial diamonds are embedded in a cast metal matrix. The plaintiff divides its operation of casting diamond core bits into two separate steps. In the first step it employs what is called a "suction cup," in principle the same as the vacuum chamber and air-suction means found in McClintock; they may be regarded as being one and the same thing, designed and intended for the same purpose, namely, the temporary retention of the diamonds by air-suction in the holes wherein they were placed. On the top of this suction cup is placed a die plate having, as in McClintock, many small perforations wherein are placed the diamonds. The diamonds being in place the air-suction means is called into play to hold the diamonds in place in the die plate. In the meanwhile a thin coating of some adhesive material, such as collodion, is sprayed over the die plate and diamonds to hold the latter in place, and after the adhesive has firmly set the air-suction is discontinued. We now have the diamonds fixed in the die plate, with the danger of "floating" probably eliminated, when the casting of the core bit takes place. The die plate is then removed and located in the outer end of a mold cavity in the casting apparatus or machine, and then the second step or operation, the casting of molten metal into the mold to form the core bit and envelop portions of the diamonds, is commenced. The molten metal is poured into a pouring tube, and, by a centrifugal force caused by the rotation of a turn-table on which the pouring tube is attached, is forced around and against the die plate holding the diamonds, and when that operation is fully completed we have in the rough a core bit with the diamonds partially embedded therein; some machine work must be done upon the core bit, but it is not necessary to describe that. The heat of the molten metal burns up the adhesive that tem-

porarily kept the diamonds in place, and passes off in the form of a gas.

It will thus be seen that the plaintiff places its diamonds in a die plate, and retains them in place by air-suction until the adhesive has set and the diamonds are fixed securely in the die plate, after which the air-suction is discontinued. The die plate is then removed and located in the outer end of a mold in the casting mechanism, and the casting of the core bit is begun. The plaintiff injects the molten metal into the mold, by a centrifugal force, whereas McClintock allows the metal to flow vertically by gravity into the mold. The fact that in the plaintiff's casting arrangements a centrifugal force is used, in moving the molten metal into the mold, does not in my opinion distinguish it, in the patent sense, from McClintock. That is a mere equivalent and did not require an inventive step. The use of centrifugal force was necessary in the case of the plaintiff's machine because its casting mechanism is planned on a horizontal basis and not on a vertical one. Being horizontal, a centrifugal force was imperative to drive the molten metal to the end of the mold, and a rotating turn-table was required to create the centrifugal force. If this structure were erected vertically that would have obviated the necessity of the turn-table and its accessories, and also the centrifugal force, and it would in principle and effect be a replica of defendant's structure down to the die plate.

It must, I think, be conceded that the plaintiff employs air-suction for the same purpose of McClintock, but, it was contended by Mr. Smart that this operation was carried out in one piece of mechanism, before the casting of the core bit in another piece of mechanism, and not while the casting was taking place as in McClintock, which, he said, so distinguished the method and means employed by each of the rival parties here, that there could be no infringement of McClintock. Dividing the manufacture of a diamond core bit into two steps does not, in my opinion, mean that there is a diversity of means and method employed by the plaintiff and the defendant. The taking of two steps to do that which a patentee does in one step should not be permitted to destroy an invention, unless the former represents an entirely different conception of means and method for securing the same end, which I do not think can be said of the plaintiff's means and method.

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Doing the same thing in a little different way, using two separate mechanisms to do what a patentee does in one combination of parts, or producing an article which may be a little better than that produced by a patentee, afford no defence to one charged with infringement by a patentee. When the underlying principle of McClintock was once known it would not be difficult for an experienced engineer to vary its structural details by the use of equivalents, or by a different arrangement of parts, or by a change in the order of the steps or processes taken, but that would not mean that the substance of McClintock's invention was not taken.

An individual machine may be considered as a mode of operation embodied in tangible materials, and its essential characteristics are those by which it is enabled to perform its functions according to the structural law imposed on it by its inventor. The first subject for examination is the function of each machine, and if diversity be here found the conclusion that the two machines are not the same becomes inevitable. If their functions prove to be identical two points remain to be considered: the nature of their essential parts, and the character of their respective structural laws. If the integral parts of each are interchangeable with those of the other without disturbance of its functions, these parts are mere equivalents, if each essential part of each machine performs its office in substantially the same order and direction and degree as its equivalent in the other, the structural law of each must be the same. Here, I think it may be said that the structure of the plaintiff and that of the defendant perform the same functions and are governed by substantially the same structural law. The essential and common characteristics of each are the integers in which the diamonds are first placed, the provision of a vacuum chamber or cup, and the employment of air-suction means for holding the diamonds in place temporarily, until in the case of the plaintiff, the adhesive has set, and in the case of the defendant until the molten metal so envelops portions of the diamonds at the end of the mold that they become firmly fixed therein. The integral parts of the one may be said to be interchangeable with the other, and are mere equivalents. The vital characteristic of each is the employment of air-suction to keep the diamonds in place

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until they are fixed in their respective seats, prior to or during the casting. And substantially the plaintiff does this in the same way as the defendant. The plaintiff, I think, has taken the substance of the defendant's invention, and any difference in the arrangement of parts, in the material employed, or the order of the different steps in the manufacture, are here diversities of form and not diversities of substance.

I might conclude by referring to certain observations of my own in the case of *Lightning Fastener Co. Ld.* v. *Colonial Fastener Co. Ld.* (1)—a case in several respects similar to that under discussion—which would seem to be quite applicable here. There, I said:

> In each case the substance, or principle, of the invention and not the mere form is to be looked to. It has been stated in many cases that if an infringer takes the principle and alters the details, and yet it is obvious that he has taken the substance of the idea which is the subject-matter of the invention and has simply altered the details, the Court is justified in looking through the variation of details and see that the substance of the invention has been infringed and consequently can protect the inventor. And the question is not whether the substantial part of the machine or method has been taken from the specification, but the very different one, whether what is done by the alleged infringer takes from the patentee the substance of his invention.

My conclusion is that the plaintiff's machine or machines infringe, or would infringe if sold and used in Canada, claims 1 and 4 of McClintock, and that therefore the plaintiff is not entitled to the declaration claimed. The action is therefore dismissed and with costs.

Judgment accordingly.

(1) 1932 Ex. C.R. 89; 1933 S.C.R. 363; 57 R.P.C. 349.