Keyes Vs. Grant

Keyes Vs. Grant

SooperKanoon Citation : sooperkanoon.com/85331

Court : US Supreme Court

Decided On : Apr-19-1886

Appeal No. : 118 U.S. 25

Appellant : Keyes

Respondent : Grant

Judgement :

Keyes v. Grant - 118 U.S. 25 (1886)
U.S. Supreme Court Keyes v. Grant, 118 U.S. 25 (1886)

Keyes v. Grant

Argued April 2, 1886

Decided April 19, 1886

118 U.S. 25

ERROR TO THE CIRCUIT COURT OF THE UNITED

STATES FOR THE DISTRICT OF COLORADO

SYLLABUS

When the defendant in a suit for the infringement of a patent sets up a prior publication of a machine anticipating the patented invention, and it appears that there are obvious differences between the two machines in the arrangement of the separate parts, in the relation of the parts to each other, and in their connection with each other in performing the functions for which the machine is intended, and experts differ upon the questions whether these differences are material to the result, and whether they required the faculty of invention, those questions are questions of fact to be left to the determination of the jury, under proper instructions from the court.

This was a suit at law to recover damages for the infringement of letters patent. The case is stated in the opinion of the Court.

Page 118 U. S. 26

MR. JUSTICE MATTHEWS delivered the opinion of the Court.

This was an action at law to recover damages for an alleged infringement of letters patent No. 121,385, issued November 28, 1871, to the plaintiffs, for an improvement in furnaces for smelting lead and other ores. There were several defenses set up by way of pleas, but the two chiefly relied on were that "the plaintiffs' pretended invention" had been described

"in a certain printed publication entitled 'system der Mettallurgie,' von Dr. J. B. Karsten, published at Berlin, Prussia, in 1831-32, in 5 volumes, with an atlas of plates, I. at pages 315, 316, 317, 318, 319, 320, 321, and 322, of volume 3, and pages 150 to 166, both inclusive, and 166 to 180, both inclusive, of volume 5, and figures 479, 480, 481, 482, 483, 484, 473, 474, 475, on plate XXI, and figures 850 to 868, both inclusive, of plate XLI of the atlas accompanying said work,"

and secondly that in view of the state of the art at the date of the alleged invention, the improvement was not patentable, as not requiring the exercise of invention. The issues came on for trial before a jury, and there was a verdict for the defendants and judgment thereon, to reverse which this writ of error is brought.

It appears from the bill of exceptions that the plaintiffs read in evidence the patent sued on, the substantial part of the specifications attached to which was as follows:

"The object of this invention is to provide a novel, simple, and improved method of tapping or withdrawing lead and other metals, when in a molten state, from the bottom of a smelting furnace so that the metal may be obtained therefrom in a clean state, and also that the formation of hard matters or encrustations on the sides and bottom of the furnace may

Page 118 U. S. 27

be avoided. The nature of this invention consist in the use or employment of a basin of suitable dimensions, located a short distance from one side of the furnace and at a suitable elevation above the bottom of the furnace, which said basin is connected with the furnace by means of a tube which extends from the bottom of the basin to the bottom of the furnace. As the molten metal fills the lower part of the furnace, it rises to the same level in the tube until it reaches the basin, from whence it may be removed as clean metal."

"To enable others skilled in the art to make and use our invention, we will proceed more particularly to describe the same:"

"The figure represents a sectional elevation of a portion of a smelting furnace with our improvements."

" *A* represents the furnace, which may be of ordinary or common construction. *B* is a basin of suitable dimensions, located at the top of an extension built on one side of the furnace and at a suitable elevation above the bottom of the furnace. The basin may be constructed of any material suitable for receiving and holding the molten metal. Extending from the bottom of the basin *B* to the bottom of the furnace *A* through the above mentioned extension is a tube *C* which connects the basin with the furnace and which may be made of iron, clay, or other material suitable for the purpose."

"The metal, as it melts, falls to the bottom of the furnace. As the surface of the molten metal rises within the furnace, it rises to the same level in the tube *C* until it reaches the basin *B* , from which it may be removed with a ladle. The advantages of this invention are obvious, as by this means the metal is tapped or withdrawn from the furnace free from impurities, and it will also be seen that the difficulties arising from the formation of hard matter or encrustations on the bottom or sides of the furnace occasioned by the usual method of drawing off a large quantity of molten metal at one time are obviated."

"Having thus described our invention, what we claim as new and desire to secure by letters patent of the United States is

Page 118 U. S. 28

the method of tapping or withdrawing molten lead or other metals from a smelting furnace by means of the basin *B* and tube or connection *C* in combination with the furnace, substantially as shown and described."

The drawing referred to is as follows:

image:a

Albert Arents, one of the plaintiffs, testified to his own qualifications as an expert in the art of smelting, and also

"That the obtaining of clean metal from the side of a furnace of ordinary construction automatically, by the means described in the specifications in the patent, was novel and useful, and a great improvement over the old method of withdrawing clean metal from smelting furnaces; that the specifications were sufficiently full, clear, and precise to enable persons skilled in the art to which they appertained, to-wit, the art of smelting, to construct a furnace which would produce the useful result claimed by the patent, to-wit, the obtaining clean metal automatically from a smelting furnace, when in operation of ordinary construction; that a furnace of ordinary construction, as it existed at the date of plaintiffs' patent, as defined by the art of smelting, so far as is material to this case, consisted of an

inner hearth, with an open breast or sump, into which the molten masses of the furnace, when fused, collected and settled according to their specific gravities; that the front of a smelting furnace was that part of the furnace where the slag

Page 118 U. S. 29

ran and was handled by the smelter; that the back of the furnace was opposite to the front, and that those parts of the furnace to the right and left were known and called the 'sides;' that the slag ran off through a spout over the open breast of the furnace in front, and the clean metal was tapped periodically from a tap hole at the bottom of and from the side of the furnace; that each part in the construction of the furnace had its particular functions, which were important as understood and known and taught in the art of smelting at that time, to-wit: the front was the working door of the furnace, and was where the slag ran off and was handled; the back and sides where the tuyeres were situated, through which the blast was forced into the furnace, and the clean metal was periodically drawn or tapped from one side or other of the furnace."

The plaintiff then introduced a model on the scale of one inch to the foot, in sections, showing what a furnace of ordinary construction was at the date of the patent, as known in the art of smelting, showing the improvement of the plaintiffs and the old mode of tapping, of which the following are drawings:

image:b

Page 118 U. S. 30

image:c

The plaintiffs then corroborated this testimony of Arents by that of numerous experts, and gave evidence tending to prove infringement by the defendants, and rested their case.

The defendants put in evidence certain extracts from the text and illustrative drawings of smelting furnaces of the treatise upon metallurgy by Dr. J. B. Karsten, published at Berlin in 1831-32, mentioned in the plea, translated as follows:

"(318) The fore-hearth is that part of the crucible projecting in front of the firewalls of the furnace."

"Crucible furnaces are those shaft furnaces in which the crucible is entirely one the inside. They are divided into eye crucible furnaces and tap crucible furnaces. The former have an eye in the front wall from which the slag flows continuously, the metal and matter being tapped off at intervals into basins."

"The tap crucible furnaces are those in which the metal, matte, and slag are all tapped off from time to time."

"Sump furnaces are those shaft furnaces in which the crucible is partly in the furnace and partly in front of the furnace. The slag runs off continuously over the forehearth. The metal and matte are tapped off into receiving vessels or tap basins. Sometimes the sump furnaces are not provided with tap basins,

Page 118 U. S. 31

and the metal in them is dipped with ladles direct from the forehearth. Spur or channel furnaces are shaft furnaces without a crucible. The molten contents flow through the eye directly from the furnace hearth into receiving vessels. These different furnaces can be more advantageously studied from drawings than from written descriptions."

"(319) In some countries, the crucible furnace is preferred; in others, the sump furnace. It is not advisable to use the channel furnace when clean metal is produced. With this furnace, the metal is not protected from oxidation. It is used chiefly in smelting copper ores, with a view to producing copper matte."

"The drawings, figures 461 to 463, represent an eye crucible furnace. The slag runs continuously through a hole in the front wall. The metal and matte are tapped off at intervals through a hole in the side of the crucible."

"The drawings, figures 464 to 466, represent an eye crucible furnace, which differs from the former in that the tap hole is in the front wall and at the bottom of the crucible."

"The drawings, figures 467 to 469, represent a tap crucible furnace. The metal, matte, and slag are tapped off from time to time into receiving basins."

"The drawings figures 470 to 472, represent an eye crucible similar to the one represented by drawings figures 464 to 466. It is provided with two tap basins. The slag also passes through a basin, for the purpose of allowing the small particles of metal and matte mixed with it to settle."

"(320) The drawings, figures 473 to 475, represent a sump furnace with a covered eye, in which the brasque (a mixture of fire clay and coke dust) under the front wall divides the sump into two communicating vessels. The slag runs off continuously through the eye between the bottom of the front wall and the top of the brasque partition. This arrangement is used when it is desired to dip the clean metal with ladles from the forehearth instead of drawing it off into tap basins. "

Page 118 U. S. 32

"The drawings, figures 476 to 478, represent a sump furnace with an entirely open breast, in which the slag passes off immediately over the forehearth."

"The drawings, figures 479 and 480, represent a sump furnace with a covered eye and with a tap basin, into which the metal and matte are tapped from the forehearth. This furnace might be regarded as a channel furnace by simply considering the short canal or eye which connects the sump under the shaft with the forehearth, as a channel. But by means of this short canal or eye, the sump and the forehearth stand in combination with each other as a pair of communicating tubes or vessels; consequently it is a sump and not a channel furnace. The slag may pass through the covered eye into the forehearth, or through an open eye above the forehearth, the latter eye being used exclusively for the slag. In smelting operations, where little or no slag is produced, the upper eye is dispensed with entirely."

The following are figures 858-860, and their scale, from plate XLL of Karsten's Atlas (*see also* pages 118 U. S. 33 and 118 U. S. 34):

image:d

Page 118 U. S. 33

image:e

The defendants also introduced experts as witnesses whose testimony tended to prove that, as stated by one of them,

"The furnaces thus figured by Karsten are planned for withdrawing the reduced metal continuously, and as fast as possible, from the oxidizing action of the blast and the intensely heated part of the slag. So the metal is made to flow constantly outward and upward through the open eye into the forehearth, which is made as high as the inner crucible, and generally the clean molten metal alone is passing through this bottom eye. When much slag is formed, it is run off separately by another eye placed higher up. When very little slag is produced, it accumulates for a long time on the top of the molten metal in the inner crucible, and the clean metal in the forebay "

Page 118 U. S. 34

image:f

"may be partially removed many times without allowing any of the slag to escape through the eye."

One of the defendants, James Grant, was called to prove that he had constructed an experimental furnace of small size according to the description and drawing of Fig. 860 of Karsten's publication and worked it successfully. A model was exhibited, the proportions and features of which are shown in the following drawings:

image:g

And his testimony was supported by that of others who had seen the furnace in operation.

On the other hand, the plaintiffs in rebuttal called expert witnesses who testified that the plaintiffs' furnace, as described in the patent, differed materially from that described by Karsten and from the model of the one made by the defendant Grant, and who pointed out in their evidence the particulars in which that difference consisted in the construction and arrangement of the furnace, in the principle of its operation, and in the results produced.

All of the evidence on both sides having been given, the whole of which is set out in the bill of exceptions, the court, having refused to charge the jury as requested by the plaintiffs, instructed the jury to return a verdict for the defendants, which was done, and to this ruling exception was duly taken, and is now assigned for error.

The judgment entered on the verdict rendered in favor of the defendants in pursuance of the direction of the court can be maintained only on the ground, either that the legal identity of the furnace described by Karsten with that covered by the plaintiffs' patent was manifest as a matter of law or that it was established as a matter of fact so conclusively by the evidence that a verdict the other way could not be supported within the rule as stated in *Randall v. Baltimore & Ohio Railroad Co.,* 109 U. S. 478 .

Clearly it was not matter of law that the specification of the plaintiffs' patent and the publication of Karsten, taken in connection with the drawings intended in illustration, described the same thing. The differences were obvious in the arrangement of the parts and the relation of the basin in one and the forehearth in

the other to the interior of the furnace, and the mode of connecting the one with the other for the purpose of drawing the metal from the furnace. So that it certainly was not a matter of mere judicial knowledge that these differences were either not material in any degree to the result or, if material at all, were only such as would not require the exercise of the faculty of invention, but would be suggested by the skill of an experienced workman employed to produce the best result in the application of the well known arrangements of the furnace. It was claimed on behalf of the plaintiffs that the furnace described in the patent and as used by them embodied an idea not contained in or suggested by Karsten's publication. That idea consisted in the employment of a basin to receive the molten metal, located at a suitable elevation above the bottom of the furnace and connected with the interior of the furnace by means of a tube, so that instead of tapping a lead smelting furnace by withdrawing the molten metal through a tap hole near the bottom, it was proposed to allow the metal to flow upwards into the receiving basin under the operation of the familiar natural law that liquids will seek the same level in communicating vessels. The object to be attained by this arrangement was that clean metal, unaccompanied with slag or other impure products resulting from the operation of smelting lead ores, should after settling to the bottom

Page 118 U. S. 37

of the furnace, by reason of its greater specific gravity, ascend through the connecting tube, as the mass of molten metal accumulates and rises within the furnace, into the receiving basin, and be dipped thence with a ladle. It was insisted by the patentees that no such arrangement and combination were to be found in Karsten's publication or in the furnaces depicted in his figures, and that the improvement which they constituted was not the result of mere mechanical skill, but sprung from a genuine effort of invention, and this view was supported by the opinion of many experts skilled in the art.

In our opinion this was a question of fact properly to be left for determination to the jury under suitable instructions from the court upon the rules of law which should guide them to their verdict. And there was evidence upon both sides of the issue sufficient to require that it should be weighed and considered by the jury in the

determination of the question, and this implies that if it had been submitted to the jury and the verdict had been for the plaintiffs, it would not have been the duty of the court to have set it aside as not supported by sufficient evidence. The court erred, we think, in withdrawing the case from the jury, as it did by directing a verdict for the defendants. For this error the judgment is

Reversed and the cause remanded with directions to grant a new trial.