Hoyt Vs. Horne

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Appeal No. : 145 U.S. 302

Appellant : Hoyt

Respondent : Horne

Judgement :

Hoyt v. Horne - 145 U.S. 302 (1892)
U.S. Supreme Court Hoyt v. Horne, 145 U.S. 302 (1892)

Hoyt v. Horne

No. 336

Argued April 26-27, 1892

Decided May 16, 1892

145 U.S. 302

APPEAL FROM THE CIRCUIT COURT OF THE UNITED

STATES FOR THE DISTRICT OF MASSACHUSETTS

SYLLABUS

The machine manufactured under letters patent No. 347,043, issued August 10, 1886, to John H. Horne for "new and useful improvements in rag engines for beating paper pulp" is an infringement of the first claim in letters patent No. 303,374, issued August 12, 1884, to John Hoyt, for a rag engine for papermaking.

Whether it infringes the second claim in Hoyt's patent is not decided.

The court stated the case as follows:

This was a bill in equity for the infringement of letters patent No. 303,374, issued August 12, 1884, to John Hoyt, for a rag engine for papermaking. "This invention," said the patentee in his specification,

"relates to engines for beating rags and similar fibrous material into pulp for the manufacture of paper. In these machines, a beater roll set with knives around its periphery is used in combination with a bedplate also set with knives, the said parts being placed in a tank or vessel in which a constant circulation of the material to be pulped is maintained. "

Page 145 U. S. 303

"Heretofore ordinarily the material has been circulated horizontally around an upright partition termed a 'mid-fellow,' and the beater roll and bedplate have been placed in the alley or channel between this mid-fellow and one side of the tank. The beater roll lifted the material over a sort of dam (termed a 'back fall'), and the material then flowed by the action of gravity around the mid-fellow and entered again between the beater roll and the bedplate. It has, however, been proposed to dispense with the mid-fellow, and have the material turned under the back-fall and bedplate. In either case, however, the circulating force is that of gravity due to the pilling up of the liquid or semiliquid on the side of the back-fall opposite from the beater roll. Consequently the flow is comparatively feeble, and it is necessary to use a large quantity of water in order to prevent the fiber in suspension from depositing. In the present invention, a much more rapid and vigorous circulation is

maintained. The beater roll is placed at one end of the vat, which is of a depth sufficient to contain it, and the other part of the vat is divided by a horizontal partition or division, which extends from the beater roll nearly to the other end. The material to be pulped is carried around by the beater roll, and is delivered into the upper section above the partition. It flows over the partition, then passes down around the end of the same and returns through the lower section of the vat to the beater roll. The bedplate is placed at the bottom of the vat under the beater roll. The beater roll not only draws in the material, creating a partial vacuum in the lower section of the vat, but delivers it into the upper section with considerable force, impelling it forward very rapidly. By the aid of this more rapid as well as more vigorous circulation, not only is the material returned more quickly, and therefore acted upon more often by the beater roll in the same time, but it may be worked with a much less quantity of water, and thereby very important advantages may be secured. These advantages are first in the improved quality of the product, for when a considerable body of the fibrous material is drawn between the knives the different pieces are rubbed together, and thus disintegrated, without

Page 145 U. S. 304

destroying the length and felting quality of the fiber, whereas when the pulp is thin, the pieces are ground individually, as it were, between the knives, and the integrity of the fiber in large measure destroyed; secondly, in the greater quantity of pulp which can be prepared in a medium of given size, owing to the larger proportion of fibrous material in the charge; and, thirdly, in avoiding the liability of the fibrous material depositing out of the liquid and lodging in the channels. . . ."

"The operation of the engine is as follows: the beater roll and bed plate knives being adjusted properly, the vat is filled with the rage or fibrous material to be pulped and the proper quantity of water. The beater roll being revolved at the proper speed -- say, for a roll four feet in diameter, at the speed of 120 revolutions per minute -- the rags and liquid are drawn between the knives, are carried up by the beater roll, and thrown over the edge of the plate, P. They flow around the partition, N, with considerable velocity, and return again and again to be acted upon by the knives. The roll is revolved until the pulp is properly reduced."

"Modifications may be made in details of construction without departing from the spirit of the invention, and parts thereof can be separately used if desired."

The claims alleged to have been infringed were as follows:

"1. The improvement in beating rags to pulp in a rag engine having a beater roll and bedplate knives, consisting in circulating the fibrous material and liquid in vertical planes, drawing the same between the knives at the bottom of the vat, carrying it around and over the roll, and delivering it into the upper section of the vat, substantially as described."

"2. A rag engine for papermaking comprising the vat, the beater roll mounted on a horizontal shaft in one end of the vat, and the horizontal partition dividing the body of the vat into an upper and a lower section or passage, the fibrous material and liquid being carried from the lower section between the knives and delivered over the top of the beater roll into the upper section or passage, substantially as described."

The device employed by the defendant was manufactured

Page 145 U. S. 305

under letters patent No. 347,043, issued August 10, 1886, to John H. Horne, the defendant. With relation to the peculiar feature of his invention, he stated in his specification as follows:

"One great difficulty hitherto in the construction of these engines, whatever may be the path of travel given to the material contained in them, consists in the fact that the various fibers or bunches of fiber, after being placed within the engine, maintain concentric paths of movement with respect to each other. Thus a piece of stock located near the sides of the tub, or one placed near the mid-fellow, will continue to travel in concentric paths until the engine is emptied, except in case manual labor is applied with a paddle to disturb their courses and compel them to deviate therefrom; hence it is obvious that the fiber traveling the more rapidly will be reduced more quickly, and the 'stuff' is of uneven quality. . . ."

"The essential object of my invention is to effect a change in the course of the material in the engine automatically and obliquely to the longitudinal axis of the engine during each complete passage thereof around the tub, and thereby thoroughly mix the stock. Thus, the particles which are nearest the mid-fellow in one passage about the tub, and which therefore traveled the fastest, are directed and changed obliquely across the engine prior to their passage about the roll, and hence they will emerge and are located near the side. Such stock will consequently travel the slowest during the next passage around the tub, since it remains contiguous to the retaining walls of the latter. This mixing and stirring of the material within the tub is effected primarily by the shape of the tub in cross-section, the width of which is equal to the active face of the roll, or thereabouts, the latter located in one end thereof. Thus, to effect the desired change in the path of movement of the stock the proportions of the tub are altered, and in cross-section the two passages formed in the tub by the mid-fellow are twice as deep as they are wide, or thereabout. Again, the stock is permitted to fill the entire width of the engine just prior to its entrance beneath the roll, and also immediately after leaving the same; hence the mid-fellow terminates a

Page 145 U. S. 306

short distance before reaching the roll, and the stock, as it approaches the latter, as before premised, is permitted to spread out and fill the entire width of the engine. . . . After the passage of the stock between the roll and the bedplate, the particles composing it are directed upon and over the backfall, which here extends entirely across the engine and in front of the roll, but contracts as it extends away from the latter, until it unites with the mid-fellow, whence it is continued downward between the latter and the side of the engine to the bottom of the tub. This contraction of one-half its width again restores the mass of stock to a general vertical position, and the latter is so maintained until just prior to its return passage beneath the roll. Thus it will be evident that the fibers composing the material in process of being pulped cannot travel in continuous concentric paths of movement, but are changed and forced obliquely of the engine, whereby a thorough mixing of the stock is automatically effected by the spiral motion imparted

to it both before and after leaving the roll."

The case was heard in the circuit court upon pleadings and proofs, and a final decree entered dismissing the bill upon the ground that the defendant had not infringed the plaintiff's patent. 35 F. 830. From this decree the plaintiff appealed to this Court.

MR. JUSTICE BROWN, after stating the case in the foregoing language, delivered the opinion of the Court.

The engine in ordinary use by papermakers for the reduction of rags to pulp prior to the invention in question consisted of a tub about fourteen feet in length, with straight sides and semicircular ends. Through the center of this ran a vertical partition called the "mid-fellow," extending lengthwise of the tub and with sufficient room between the ends of

Page 145 U. S. 307

the partition and the ends of the tub to allow the pulp to pass around from one side of the tub to the other. Midway of the tub, and between the mid-fellow and one side, was a wheel or beater roll armed with knives placed longitudinally upon the periphery of the wheel. Beneath the roll were corresponding knives in the bedplate, and by the revolution of the wheel the rags were drawn between these knives and reduced to pulp. At one side of the roll, the bottom of the tub was curved upwards, forming a ridge or dam, termed a "back-fall," about four inches high, extending across the channel parallel with the roll. The beater roll revolved away from the top of the back-fall, and the material, being lifted by the rotation of the roll to the top of the back-fall, slid down the incline by gravity, which was the only force acting to cause a flow of nearly thirty feet, from the back of the beater roll around to the front of it again. The speed of the pulp was thus necessarily very slow.

1. The novelty and patentability of the Hoyt patent were not denied, though two prior patents were referred to for the purpose of limiting its claims. The Umpherston engine was patented in England in April, 1884, a few months before

the Hoyt patent was issued in this country. This machine differs from the old tub only in the fact that the mid-fellow runs horizontally instead of vertically, and the return passage or channel for the pulp is underneath instead of alongside of the channel containing the beater roll. Apparently the only advantage which it possesses over the old one is in economy of floor space.

The Cooke engine, patented in England in 1880, is a machine of the type known as "disk grinders," and is not a beating engine of the type of the machines involved in this suit. It has no beater roll, the grinding being done by two disks at the end of the tub, between which the pulp is drawn in at the center of the disks, and works it way outward to the periphery between the grinding surfaces. It seems to us to have little bearing upon the present case except in the fact that the grinding mechanism is located at the end of the tub instead of in the center.

The Hoyt engine differs from the old tub in ordinary use

in two or three important particulars: first, the beater roll is located at the end of the tub, instead of in the center, having in his particular a certain resemblance to the Cooke machine; second, the mid-fellow runs horizontally instead of vertically, a feature in which it resembles the Umpherston engine; and third, the beater roll extends across the whole width of the tub, and its revolutions are toward, instead of away from, the top of the back-fall or dam. The result of this is such a greatly increased speed in the flow of the pulp that it is said to be brought in contact with the knives twelve times as often as was possible in the old tub or engine.

The circulation of the material around the roll in vertical planes is the salient feature of the Hoyt invention, and its utility is shown in its general adoption by papermakers.

2. The main question in the case is that of infringement. In the defendant's engine, the beater roll is also located at the end of the tub and extends across its entire width; the top of the back-fall or dam also extends across the entire width in front of the beater roll, but narrows at one side as it descends to the bottom of the tub to

one-half of its width. The mid-fellow is made vertical, instead of horizontal, so that the pulp, after it leaves the dam, circulates in a horizontal instead of a vertical plane; but as it returns to the beater roll, it passes back under the dam, spreading out to the entire width of the tub, and is taken up by the beater roll precisely as in the Hoyt patent. It is insisted by the defendant in this connection that there is no infringement of the first claim of the Hoyt patent, since the pulp is not circulated "in vertical planes," nor is it delivered by the beater roll "into the upper section of the vat," as specified in that claim. Literally it is not. A technical reading of the specification undoubtedly required that the mid-fellow should run horizontally instead of vertically, but the object of this was that the pulp should be received and delivered by the beater roll along its entire length, *viz.,* across the entire width of the tub, and this is accomplished in the same way in both devices. In both engines, the beater roll revolves toward the top of the dam or back-fall, and a similar acceleration of speed is obtained. How

Page 145 U. S. 309

the pulp shall circulate at the other end of the tub is a matter of small consequence so long as it shall circulate in vertical planes at the point where it comes in contact with the roll.

An additional function is claimed for the Horne device in the fact that the pulp, falling as it descends the dam from a vertical to a horizontal plane in a kind of torsional current, is more thoroughly mixed than in the Hoyt device, where the pulp continues to flow in parallel lines from the time it is delivered by the beater roll to the time it is received by it again. This may be true, and defendant's engine may be in this particular an improvement upon the other; but he has nonetheless succeeded in appropriating all that was of value in the Hoyt device -- *viz.,* the beater roll at the end of the tub, extending across its entire width, and the circulation of the pulp in vertical planes at the only point where such circulation is of value. The substitution of a vertical for a horizontal mid-fellow at the inoperative end of the tub is merely the use of an old and well known mechanical equivalent, and obviously intended to evade the wording of the claims of the Hoyt patent. *Winans v. Denmead,* 15 How. 330. Indeed, the ingenuity displayed in this evasion

is only equaled by the ingenuity with which it is concealed in the specification of the defendant's patent, and the function of a more thorough mixture of the pulp put forward as the salient feature of the invention. The actual intent to evade is the more manifest from the fact that Horne, under a contract with the plaintiff, made seventeen machines according to the plaintiff's patent, but, owing to some disagreement as to the quality of the work done by him, the contract was terminated, and Horne began the production of his own engines, and subsequently took out a patent for his invention.

We are therefore of opinion that defendant's machine is an infringement of the first claim of the plaintiff's patent. Whether it be an infringement of the second claim admits of more doubt, since that contemplates a horizontal partition dividing the body of the vat into an upper and lower section or passage. We do not, however, find it necessary to pass upon this question.

Page 145 U. S. 310

The decree of the court below is therefore

Reversed, and the case remanded with instruction to enter a decree for the plaintiff upon the first claim, and for further proceedings in conformity with this opinion.