

Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U.S. 45 (1923)

Syllabus | [Case](#)

U.S. Supreme Court

Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U.S. 45 (1923)

Eibel Process Company v. Minnesota & Ontario Paper Company

No. 178

Argued January 5, 8, 1923

Decided February 19, 1923

261 U.S. 45

Syllabus

1. The Eibel patent, No. 845,224, for an improvement on Fourdrinier papermaking machines, whereby, mainly through a substantial elevation of the breast-roll end of the moving screen or "papermaking wire," the liquid stock discharged upon the screen acquires, through gravity, an additional speed, enabling it to keep pace with the screen at the critical paper-forming point, thus avoiding injurious disturbances of the stock when the screen moves very rapidly, and making possible a much speedier production of good paper than was theretofore obtained from the machines without the improvement *held* a new and useful invention. P. 261 U. S. 52.

2. The prompt and general adoption of the improvement, with increased productivity of the machines to which it was applied, is strong evidence of its novelty and usefulness. P. [261 U. S. 56](#).

3. Previous adoption of a comparatively slight pitch of the screen, but for another and distinct purpose, did not constitute anticipation of this invention. P. [261 U. S. 58](#).

4. Oral evidence of prior discovery must be clear and satisfactory to sustain an attack on a patent. P. [261 U. S. 60](#).

5. A patent for a very meritorious improvement on an old machine, substantially advancing the art, is entitled to a liberal construction. P. [261 U. S. 63](#).

6. In this case, the patent is construed to cover a Fourdrinier machine in which the pitch of the wire screen is used not as the sole, but as an appreciable, factor in addition to those already present in bringing about approximate equal velocity of stock and screen at the point where otherwise injurious disturbances of the stock would be produced. P. [261 U. S. 65](#).

7. General descriptive terms in a patent are not objectionable where it would have been difficult to make them more specific and where the description is sufficient to enable those skilled in the art to apply the invention. P. [261 U. S. 65](#).

8. Accidental results, not appreciated, will not constitute anticipation. P. [261 U. S. 66](#).

Page [261 U. S. 46](#)

9. An increased elevation in the pitch of an element in a machine beyond that previously employed for another purpose is not mere matter of degree, but amounts to invention when applied successfully to remedy an old defect in connection with the discovery of its cause. P. [261 U. S. 66](#).

10. The novelty of an invention is not impeached by the fact that the same results may be achieved in a different way. P. [261 U. S. 69](#).

11. The patent in this case, Claims 1, 2, 3, 7, 8 and 12, were infringed by defendants. P. [261 U. S. 69](#).

12. The first five of these are claims for a machine, and not a process. P. [261 U. S. 71](#).

274 F. 540 reversed.

This was a bill in equity charging the infringement of a patent and seeking an injunction, an accounting and damages. The patent, No. 845,224, issued to William Eibel, February 26, 1907. The application was filed August 22, 1906. The specifications describe the patent as for an improvement for Fourdrinier machines for papermaking, and say that

"it has for its object to construct and arrange the machine whereby it may be run at a very much higher speed than heretofore and produce a more uniform sheet of paper which is strong, even, and well formed."

The contention of the plaintiff, the petitioner here, is that his improvement was an important step in the art of papermaking, and increased the daily product from 20 to 30 percent

The patent was held void by the District Court for the Western District of New York in the case of *Eibel Process Co. v. Remington-Martin Co.*, 226 F. 766 (1914). On appeal, the Circuit Court of Appeals for the Second Circuit reversed the decree of dismissal in the district court, sustained the patent, and found infringement of claims Nos. 1, 2 and 3, but did not pass upon claims Nos. 7, 8 and 12. 234 F. 624, 148 C.C.A. 390 (1916). The bill in the present case was filed in the district court for Maine, January 1, 1917. That court in 1920 held the patent valid, and entered a decree of injunction and for damages.

267

[Page 261 U. S. 47](#)

F. 847. On appeal, the Circuit Court of Appeals for the First Circuit reversed the decree and directed the dismissal of the bill, 274 F. 540 (1921). Because of the conflict in the two circuits, certiorari was granted to review the latter decree.

The Fourdrinier machine has for many years been well known and most widely used for making news print paper. Its main feature is an endless wire cloth sieve passed over a series of rolls at a constant speed. The sieve, known as the "wire," is woven with 60 or 70 meshes to the inch. It may be 70 feet or more in length, and is often more than 100 inches in width. Its working surface, with the total length of 70 feet, is about 30 feet; the rest being taken up in the return of the wire underneath. At what is called the "breast roll," at one end of the machine, there is discharged upon the wire, from a flow box or pond, a constant stream of papermaking stock of fibers of wood pulp mixed with from

135 to 200 times their weight of water of the consistency and fluidity of diluted milk. As this stream moves along the wire, the water drains through its meshes and the fibers are deposited thereon. The process is stimulated by a device to shake the wire with constant and rapid sidewise thrusts, forward and back, which insures the proper interlocking and felting of the stock as it progresses, the water continuing to drain from it. At the end of the surface length of the wire, the stock reaches what are called the "couch rolls," between which it is pressed, and then, in the form of a sheet of uniformly distributed pulp, felted sufficiently to hold together, it leaves the wire and is carried through a series of rolls or calendars by which the sheet is pressed and dried, and from which it emerges to be rolled up as finished paper.

In the flow box, or "pond," where the stream of pulp stock is stored, there is a gate or door, forming the end of the flow box, called the "slice," by lifting which the stock

Page 261 U. S. 48

is given the opportunity to flow upon the wire. The stream thus issuing is given a width of the desired sheet of paper and a depth regulated by the height to which the slice is lifted. The stream on the wire is prevented from flowing off the sides by "deckle straps," which are thick rubber bands, resting on each side of the wire at each side of the pulp. Traveling with the wire, they form lateral walls confining the stock till it is too dry to flow. Between the breast roll, where the stream of liquid stock strikes the wire, and the couch rolls at the end of the surface length of the wire, there is a series of parallel horizontal rolls supporting the wire, called table rolls, and 20 feet from the breast roll there are placed, under the wire and in contact with it, three suction boxes in succession, in which a partial vacuum is maintained, and through them is sucked out the greater part of the water remaining in the wet sheet of the pulp. Placed above the wire and just beyond the first suction box is what is called the "dandy roll," which is faced with wire cloth. Its office is to impress the upper surface of the forming sheet of paper and give it a texture similar to that which the lower surface of the paper has from its contact with the wire. It may also carry the design which is to give the watermark to the sheet, if such a mark is desired. Beyond this is a larger roll, called the "guide roll," arranged with an automatic device varying its axis, so as to keep the wire straight. From the guide roll, the wire drops below the plane to the couch rolls, already referred to.

These machines are very large, some of them weighing more than 1,000,000 pounds, and their cost will range as high as \$125,000. They are run night and day, in order that the capital invested in them may yield a proper return. Speed, which increases

production, is therefore of the highest importance. Eibel's patent had for its avowed purpose of increase of this speed.

Page 261 U. S. 49

Eibel says in his specifications:

"My invention is embodied essentially in the first part or element of the machine having the Fourdrinier wire or papermaking wire, and consists in causing the stock to travel by gravity in the direction of movement of the making wire and approximately as fast as the making wire moves, thereby resulting in a 'gravity feed' for the machine. The stock may be and preferably is caused to travel more rapidly than the normal or usual speed of the making wire for a certain grade of stock, and means are provided for increasing the speed of the machine so as to cause the making wire to move at a higher rate of speed than usual, being substantially equal to the speed of the rapidly moving stock. To accomplish this result in a simple manner, the breast roll end of the papermaking wire is maintained at a substantial elevation above the level, thereby providing a continuous downwardly moving papermaking wire, and the declination thus given to the wire is such that the stock is caused to travel by gravity in the direction of the movement of the wire and substantially as fast as the wire moves. The declination of the papermaking wire may be adjustable, or the speed of the wire may be variable, or both the declination and speed of the wire may be adjustable, in order that the velocity produced by gravity in the stock on the declining wire will approximately equal the speed of the wire. By this arrangement, the speed of the machine may be increased to such an extent as to bring the speed of the making wire up to the maximum velocity of the rapidly moving stock and a strong, even, and well formed sheet produced which is more uniform than usual."

Two figures accompany the specifications of the Eibel patent. Figure No. 1 shows the wire of the Fourdrinier machine in outline from the breast roll to the guide and couch rolls, with a screw device for raising and lowering

Page 261 U. S. 50

the breast roll and wire from the horizontal. The outline shows an elevation of the breast roll and wire, so that the angle between the wire and the horizontal at the guide roll is about 4 percent, which, in a surface length of 30 feet would mean an elevation of 12 inches at the breast roll. The other figure, No. 2, shows a device for regulating the speed of the wire applied at the lower couch roll.

Again, the patentee says:

"For the purpose of increasing the speed of the machine to the maximum, I maintain the breast roll end of the making wire at a high elevation above the level, so that the stock travels by gravity much faster than the making wire ordinarily runs for a certain grade of stock, and I then increase the speed of the machine to such extent as to bring the rate of speed of the making wire up to the speed of the rapidly moving stock, and, as a result, the capacity of the machine is largely increased."

"I find in practice that, by providing a gravity feed operating substantially as herein described, the stock runs smoothly and evenly without waving or rippling, and the fibers are thereby permitted to settle with great uniformity as regards their distribution over the wire, so that the paper, in addition to being well formed, is very uniform. Furthermore, as the stock is moving with the papermaking wire, instead of being moved by the wire, or essentially by the wire, the formation of the paper will begin at the start, and will continue to the end of the travel of the stock with the wire."

The claims in question are:

1. A Fourdrinier machine having the breast roll end of the papermaking wire maintained at a substantial elevation above the level, whereby the stock is caused to travel by gravity, rapidly in the direction of movement of the wire, and at a speed approximately equal to the speed of the wire, substantially as described.
2. A Fourdrinier machine having the breast roll end of the papermaking wire maintained at a high elevation,

[Page 261 U. S. 51](#)

whereby the stock is caused to travel by gravity faster than the normal speed of the wire for a certain grade of stock, and having means for increasing the speed of the machine to cause the wire to travel at substantially the same rate of speed as the rapidly moving stock, substantially as described.

3. A Fourdrinier machine having the papermaking wire declined from the breast roll to the guide roll, the breast roll end of the wire being maintained at a substantial elevation above the level, whereby the stock is caused to travel by gravity, rapidly, in the direction of movement of the wire and at a speed approximately equal to the speed of the wire, substantially as described.

7. A Fourdrinier machine having the papermaking wire declined from the breast roll to the guide roll, and the suction boxes supported at a corresponding declination, substantially as described.

8. A Fourdrinier machine having the papermaking wire declined from the breast roll to the guide roll, and the several suction boxes arranged at different elevations, substantially as described.

12. In a Fourdrinier machine, a downwardly moving papermaking wire, the declination and speed of which are so regulated that the velocity of the stock down the declining wire, caused by gravity, is so related to the velocity of the wire in the same direction, that waves and ripples on the stock are substantially avoided and the fibers deposited with substantial uniformity on the wire, substantially as described.

[Page 261 U. S. 52](#)

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