

**VALMET PAPER MACHINERY, INC. and VALMET, INC., Plaintiffs-Appellants, v. BELOIT CORPORATION, Defendant-Appellee.**

**95-1301**

**UNITED STATES COURT OF APPEALS FOR THE FEDERAL  
CIRCUIT**

*105 F.3d 1409; 1997 U.S. App. LEXIS 1408; 41 U.S.P.Q.2D (BNA) 1619*

**January 28, 1997, DECIDED**

**SUBSEQUENT HISTORY:** **[\*\*1]** As Amended on Grant of Rehearing May 1, 1997, Reported at: *1997 U.S. App. LEXIS 9889*. Certiorari Denied December 15, 1997, Reported at: *1997 U.S. LEXIS 7525*.

**PRIOR HISTORY:** Appealed from: U.S. District Court for the Western District of Wisconsin. Chief Judge Crabb.

**DISPOSITION:** REVERSED.

**COUNSEL:** Myron Cohen, Cohen, Pontani, Lieberman & Pavane, of New York, New York, argued for plaintiffs-appellants. With him on the brief were William A. Alper and Michael C. Stuart. Also on the brief were Brian E. Butler, Stafford, Rosenbaum, Rieser & Hansen, of Madison, Wisconsin, and Michael E. Jaffe, Arent, Fox, Kintner, Plotkin & Kahn, of Washington, D.C. Of counsel were Jill R. Newman, Arent Fox, Kintner, Plotkin & Kahn, and Martin B. Pavane, Cohen, Pontani, Lieberman & Pavane.

George P. McAndrews, McAndrews, Held & Malloy, Ltd., of Chicago, Illinois, argued for defendant-appellee. With him on the brief were Steven J. Hampton and Gregory C. Schodde. Of counsel were D. David Hill and Thomas J. Wimbiscus.

**JUDGES:** Before RICH, LOURIE, and BRYSON, Circuit Judges.

**OPINION BY:** RICH

**OPINION**

**[\*1409]** RICH, *Circuit Judge*.

Appellants Valmet Paper Machinery, Inc. and Valmet, Inc. (collectively "Valmet") sued Beloit Corporation for infringement of Valmet's patent on a drying machine used in making paper. Beloit counterclaimed for infringement of two patents it holds on drying-machine inventions. **[\*\*2]** The district court granted summary judgment that Valmet's patent was not infringed, and that it did not anticipate Beloit's two patents. Following a jury trial, the court entered judgment that Beloit's patents were valid and infringed, and granted Beloit an injunction against further infringement. Valmet appeals. We reverse.

**BACKGROUND**

The patents in suit relate to the final drying portion of paper-making machinery. In **[\*1410]** the paper-making process, a system of large machines sprays a suspension of fiber and water onto a moving web. The machines then maneuver the wet web through a series of steps to remove the water, beginning with the formation stage where water drains from the web by operation of gravity. The second stage gener-

ally involves pressing additional water from the web with rollers. The last stage, the area of the inventions in this appeal, features heated drying cylinders designed to evaporate the remaining moisture as the web comes in contact with them.

The heated-cylinder segment of the drying process presents several challenges. The paper web moves through the drying machines at high speed, and these machines must avoid stretching or tearing the web. At the same [\*\*3] time, the machines must dry the paper as evenly as possible, including both the top and bottom surfaces of the web. Conventionally, this stage has employed heated cylinders in a “two tier” setup. In a two-tier arrangement, one group of cylinders lies in an upper plane and a second group of cylinders lies in a lower plane. Looking along the length of two-tier drying section, the sequence of cylinders applied alternates between the upper and lower planes such that the next cylinder in order is on the opposite plane. The paper web runs beneath a lower-plane cylinder, then over an upper-plane cylinder, then under a lower-plane cylinder, and so on. The lower cylinders apply heat to the top surface of the paper, and the upper cylinders to the bottom surface. This figure depicts a prior art two-tier dryer.<sup>1</sup>

1 Figure is the dryer portion of Fig. 2 of Goodwillie *Patent No. 2,537,129*. Small circles indicate guide rolls, large circles represent drying cylinders, and the dotted line shows the path of the paper web.

[SEE [\*\*4] ILLUSTRATION IN ORIGINAL].

Problems arise from “open draws” where the paper web must cross, unsupported, through an open space to the next cylinder. As the web speeds from under a bottom cylinder up to make contact with the next upper cylinder, for example, the portion of the web not in contact with a cylinder tends to “flutter.” This increases the risk of stretching or breakage. Two-tier dry-

ing machines have employed felt guide belts, which accompany the web through the machine then circle back to the beginning of the machine to create a continuous loop, as well as guide rollers to reduce the risk of damage to the web. A felt guide belt traveling with the web, however, prevents the heated cylinders from directly touching the web on the side adjacent to the felt.

The first of the patents in suit, the Soininen patent, No. 3,868,780 issued March 4, 1975, to Valmet as assignee. The Soininen patent claims “drying cylinder groups” comprising “two substantially parallel rows of drying cylinders” where a guide belt and guide rolls direct the web along each cylinder in the first row before bringing the web to the start of the second row, rather than alternating around cylinders in two separate [\*\*5] [\*1411] rows in different planes. After the first row, additional guide rolls cause the guide belt to run along the opposite sides of the next row of drying cylinders. As a result, a drying cylinder groups apply direct heat to one side of the web in its first group, and the other side in its second group. Soininen also discusses inclusion of “foraminous” (i.e., perforated) guide rolls and claims a structure where walls enclose the sides of the guide belt loops. Forming a closed space inside the belt facilitates introduction of a vacuum in that space to pull the paper web outside the guide belt more tightly onto the belt and rolls. The following figure comes from the Soininen patent.<sup>2</sup>

2 Figure is Fig. 1 of Valmet’s *Patent No. 3,868,780*. The web travels outside guide belt (heavy line) beginning at bottom left moving across to the right.

[SEE ILLUSTRATION IN ORIGINAL].

In 1981, a German patent application citing Soininen elaborated on the vacuum aspect of the Soininen invention. This Hauser application taught that it [\*\*6] is more efficient to place individual suction devices within each of Soin-

inen's perforated guide rolls, instead of using large walls to close off the entire space inside a guide belt. Hauser also emphasized benefits from moving the "suction guide rolls" closer to the heated drying cylinders to keep the web in contact with rolls or cylinders as much as possible. Although no patent issued, the Hauser application was published February 17, 1983. Beloit submitted only the German-language version of the Hauser publication to the patent examiner during prosecution of the two Beloit patents discussed below.

More recently, Beloit obtained patents on features of its "Bel-Champ" drying machine including *patents No. 5,144,758* ('758 *patent*) issued September 8, 1992 from an application filed November 14, 1991, and *No. 5,249,372* ('372 *patent*) issued October 5, 1993 from an application filed April 9, 1992. Basically, Beloit's patents claim a "single tier drying section" comprising "a first plurality of drying cylinders" with its own "dryer felt" and "vacuum rolls . . . in close proximity" to their adjacent drying cylinders, for drying one side of the paper web, followed by a second mirror-image [\*\*7] section for drying the other side of the web. Beloit argues that 1) the single-tier design, 2) the use of vacuum rolls, and 3) the close proximity of the vacuum rolls to the drying cylinders distinguish its invention from prior art dryer designs including Soininen and Hauser. Below is a figure from one of the Beloit patents.<sup>3</sup>

3 Figure is Fig. 15 of Beloit's *Patent No. 5,144,758*.

[\*1412] [SEE ILLUSTRATION IN ORIGINAL].

Valmet sued Beloit in the United States District Court for the Western District of Wisconsin alleging infringement of the Soininen patent, and to invalidate Beloit's '758 and '372 patents due to either anticipation or obviousness. Beloit counterclaimed for infringement. The district court granted summary judgment

that Beloit had not infringed the Soininen patent, and that Soininen did not anticipate Beloit's patents. A four-part trial followed. Dealing first with validity, a jury found claims 1 and 2 of the '372 patent and claims 1-3 of the '758 *patent* not obvious, but found claim 3 of the '758 *patent* and claims 1 and 2 of the '372 *patent* indefinite [\*\*8] and therefore invalid. As a result, only claims 1 and 2 of the '758 *patent* remained. The jury then found that Valmet infringed those two claims literally and (unnecessarily) under the doctrine of equivalents. In part three, the court ruled Beloit not guilty of inequitable conduct by failing to submit an English translation of Hauser to the patent examiner. Last, the jury found Valmet's infringement not willful, and awarded Beloit lost profits from Valmet's sale of an infringing drying machine in New Mexico.

After the verdict, the district court denied Valmet's motion for judgment as a matter of law ("JMOL") seeking to invalidate the first two claims of the '758 *patent*. Instead, the court granted Beloit's JMOL motion and overruled the jury's findings of indefiniteness. The district court then awarded damages to Beloit and granted an injunction barring future infringement by Valmet of either the '758 or the '372 patent.

## ANALYSIS

Valmet appeals the judgment that claims 1 and 2 of the '372 patent and claims 1-3 of the '758 *patent* are valid and infringed. Valmet contends the court erred by refusing to invalidate the Beloit patents on grounds of anticipation or obviousness, or to declare them unenforceable because [\*\*9] of inequitable conduct. Valmet further argues that the district court miscalculated the damages awarded to Beloit, and improperly granted an injunction barring Valmet from infringing either patent in the future.

We turn to the conclusion that the subject matter of Beloit's patents met the statutory re-

quirement of nonobviousness of 35 U.S.C. § 103 despite the teachings of the Soininen patent and the Hauser publication. The test for nonobviousness begins with a factual inquiry, and ends with a legal conclusion based on the resultant factual foundation. *Panduit Corp. v. Denison Mfg. Co.*, 810 F.2d 1561, 1566-68, 1 U.S.P.Q.2D (BNA) 1593, 1595-97 (Fed. Cir. 1987). On appeal, we apply the clearly erroneous standard to the court's factfinding, and we review the legal conclusion de novo. *Id.*

With regard to the factual inquiry, no doubt exists that the Soininen patent and Hauser publication constitute prior art, and both Beloit patents cite the two documents as prior art references. The parties vigorously contest the district court's findings and conclusions concerning the second component. The court performed this part of the inquiry when it answered the obviousness question in denying Valmet's [\*\*10] JMOL motion. The court 1) construed the asserted claims of the Soininen patent and identified its teachings, 2) construed the claims of Beloit's '758 and '372 patents, 3) found substantial differences between Beloit's claimed inventions and the prior art, and 4) ruled that Beloit's patents would not [\*1413] have been obvious in view of those differences.

Courts must construe disputed claim terms, as a matter of law, based on the claims, the specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 986 (Fed. Cir. 1995) (in banc), *aff'd*, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996). In reaching its decision, the district court focused on two aspects of the parties' competing drying sections. First, the district court examined Valmet's "drying cylinder group" with "two, substantially parallel, rows of drying cylinders," and compared it to Beloit's "single tier drying section" with two consecutive "pluralities of drying cylinders." The court found that Soininen taught a "stacked arrangement" of the two rows of cylinders, while Beloit's patents claimed a "single *horizontally disposed* plane of dryer cylinders"

(emphasis in original). Essentially, the court read Soininen to [\*\*11] teach only a sideways U-shaped (i.e., ) arrangement. Meanwhile, the court construed Beloit's asserted claims to refer to a machine that dries one side in the first plurality, then moves the web forward in a single plane into a second plurality to dry the other side. The court concluded that "single tier" means single plane, and that unfolding Soininen's two rows into a single plane would not have been obvious.

Although the figures in Valmet's Soininen patent depict various stacked arrangements, nothing in the patent requires a stacked arrangement of the two rows of drying cylinders. On the contrary, the phrase "substantially parallel" explicitly encompasses parallel configurations in one plane or in two different planes. At the same time, nothing in Beloit's '758 or '372 patents requires an arrangement of the two pluralities of drying cylinders horizontally disposed in a single plane. Furthermore, Beloit's specifications and prosecution histories make it clear that the phrase "single tier" primarily serves to distinguish prior art "two [\*\*12] tier" sections where the web traveled alternately around cylinders in two different tiers on two different planes. Thus, we hold that the district court incorrectly limited the teachings of Soininen, misconstrued Beloit's patents, and erroneously overstated the differences between the two inventions.

In the second phase of its comparison, the district court focused on Valmet's assertion that its Soininen patent in combination with the Hauser publication taught the use of vacuum or suction rolls that render the corresponding aspect of Beloit's invention obvious. The district court dismissed this argument largely based on Hauser's failure to obtain a patent on his invention, and the court noted the patent examiner's conclusion that Hauser had failed to invent anything new. Whether or not it describes a patentable invention, however, the Hauser publication undeniably teaches the use of suction

boxes to create vacuum guide rolls. *See, e.g., Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1572, 7 U.S.P.Q.2D (BNA) 1057, 1065 (Fed. Cir. 1988) (references for obviousness not limited to issued patents). Beloit seeks to avoid the import of this by limiting its focus to figure 6 of Soininen, [\*\*13] the one figure which may depict non-foraminous guide rolls. We see no reason to limit our analysis to figure 6. The whole of the Soininen patent teaches the use of foraminous guide rolls to facilitate suction through the surface of the guide rolls. Hauser then teaches the placement of individual suction boxes inside the foraminous guide rolls, rather than the use of walls closing off the entire space inside the guide belt, to create the vacuum. Hauser also states that it is known in the art to place the guide rolls close to the drying cylinders. The district court committed

clear error by disregarding these teachings of Hauser.

Given our reading of the Soininen patent and Hauser publication, and our interpretation of the Beloit patents, we hold that a person of ordinary skill in the art would have found Beloit's asserted claimed inventions obvious. Such a person would find it obvious to unfold Valmet's drying cylinder group into a straight line. Similarly, such a person would learn from Soininen the benefit of foraminous guide rolls with a vacuum, and from Hauser the advantage of individual vacuum sources inside the guide rolls. Accordingly, we hold [\*1414] claims 1 and 2 of the '372 patent and claims 1-3 of the '758 patent invalid [\*\*14] under section 103. We further reverse the award of damages and vacate the injunction against Valmet.

REVERSED.