United States Court of Appeals for the Federal Circuit

STEUBEN FOODS, INC.,
Appellant

v.

NESTLE USA, INC.,
Appellee

2017-1290

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2015-00195.

Decided: March 13, 2018

THOMAS FISHER, Oblon, McClelland, Maier & Neustadt, LLP, Alexandria, VA, argued for appellant. Also represented by W. COOK ALCIATI, CHARLIE AVIGLIANO, Steuben Foods, Inc., Jamaica, NY.

TYLER MICHAEL AKAGI, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Washington, DC, argued for appellee. Also represented by THOMAS H. JENKINS; VIRGINIA L. CARRON, KEVIN D. RODKEY, Atlanta, GA.

Before DYK, REYNA, and HUGHES, *Circuit Judges.*

HUGHES, *Circuit Judge.*

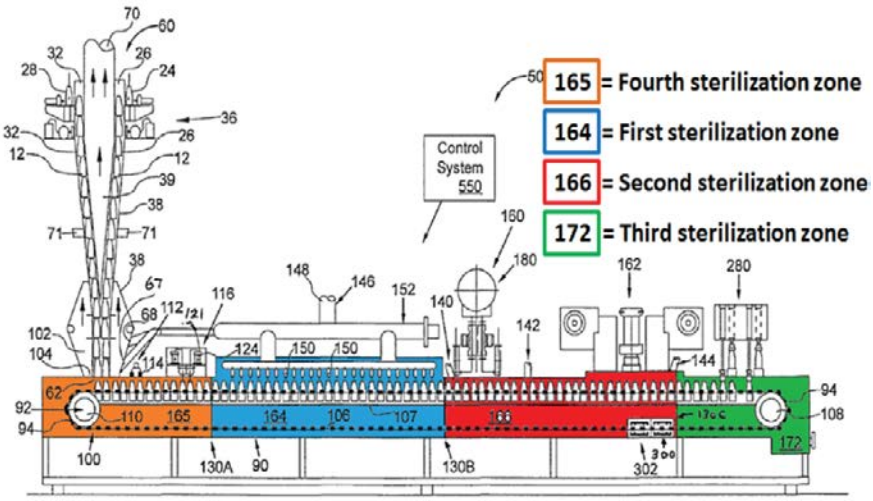
Steuben Foods, Inc. appeals from the final decision of the Patent Trial and Appeal Board in an inter partes review, finding claims 1–10, 14, 16–21, 25, 27, 29, and 32–36 of U.S. Patent No. 6,475,435 B1 unpatentable as obvious. Because we find no reversible error in the Board's decision, we affirm.

I

Aseptic packaging involves putting a sterile food product into a sterile package within a sterile environment. The '435 patent is generally directed to providing such a sterile environment in a sterilization tunnel, which is a tunnel pressurized with sterile air to a level above atmospheric pressure. The overpressure creates a flow of sterile air out of the tunnel, ensuring that contaminants cannot flow into it.

More specifically, the '435 patent discloses an apparatus and method for providing sterilization zones in an aseptic packaging sterilization tunnel that surrounds containers with pressurized gas. '435 patent, col. 1 ll. 12–14, col. 3 ll. 30–31. The aseptic sterilant used in the apparatus may be hydrogen peroxide. *Id.* at col. 2 ll. 23–27, col. 5 ll. 2–6. Figure 3 of the patent, reproduced in its annotated form below, illustrates the distinct sterilization zones in the sterilization tunnel—starting with the fourth zone (orange), followed by the first (blue), the second (red), and the third (green) zones—with the zones providing various concentration levels of sterilant within the tunnel. The fourth sterilization zone 165 includes the bottle sterilization apparatus. It has the highest hydrogen peroxide sterilant level—about 1,000 parts per million (ppm). *Id.* at col. 9 ll. 54–58. The first sterilization zone 164 includes the activation and drying apparatus. The hydrogen peroxide sterilant level in that zone is

about 3 ppm. *Id.* at col. 9 ll. 58–59. The second sterilization zone 166 includes the main product filler apparatus, and the lid sterilization and heat sealing apparatus. It has the lowest concentration level of hydrogen peroxide sterilant at about less than 0.5 ppm and typically about 0.1 ppm. *Id.* at col. 9 ll. 59–63. The third sterilization zone 172 includes a bottle discharge apparatus. The



hydrogen peroxide sterilant concentration level in that zone is about 0.1 ppm. *Id.* at col. 10 ll. 1–2.

Nestlé USA, Inc. challenged claims of the '435 patent in an inter partes review. The Board instituted trial on claims 1–10, 14, 16–21, 25, 27, 29, and 32–36 of the patent. The challenged claims are directed to the sterilization tunnel and further recite maintaining a specific ratio of sterilant concentration levels in the plurality of zones in the tunnel.

Claim 1 is illustrative and reads as follows:

1. Apparatus comprising:

a sterilization tunnel for surrounding a plurality of containers with pressurized gas; and

> a plurality of zones within the sterilization tunnel having different sterilant concentration levels therein wherein the sterilant concentration levels in the plurality of zones are maintained at a ratio of at least about 5 to 1.

Id. at col. 16 ll. 46–53. Claim 3, which depends from claim 1, requires a ratio of "at least about 1,000 ppm to 0.1 ppm." *Id.* at col. 16 ll. 56–59.

The Board found that the challenged claims would have been obvious to a person of ordinary skill in the art in view of prior art references in the record. J.A. 20–32. Steuben Foods appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II

We review the Board's legal conclusions de novo and its factual findings for substantial evidence. *Rambus Inc. v. Rea*, 731 F.3d 1248, 1251 (Fed. Cir. 2013). "[W]e review the Board's ultimate claim constructions de novo and its underlying factual determinations involving extrinsic evidence for substantial evidence." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1297 (Fed. Cir. 2015). Obviousness is a question of law, based on underlying factual findings, including what a reference teaches, whether a person of ordinary skill in the art would have been motivated to combine references, and any relevant objective indicia of nonobviousness. *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1047–48, 1051 (Fed. Cir. 2016) (en banc).

A

Steuben Foods argues that the Board erred in construing the term "sterilant concentration levels in the plurality of zones." "Unexpired claims subject to inter partes review are to be given their 'broadest reasonable construction.'" *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1068 (Fed. Cir. 2017) (quoting *Cuozzo Speed Techs.,*

LLC v. Lee, 136 S. Ct. 2131, 2144 (2016)). The Board construed "sterilant concentration levels" to be the levels measured "at *any* point within the sterilization tunnel—including the 'residual' concentration on bottle surfaces—such that the 5 to 1 ratio is satisfied." J.A. 21–22; *see also* J.A. 11–14. Steuben Foods contends that the Board construed the term "sterilant concentration levels" so broadly as to read on the concentration of sterilant "at *any* point" within the sterilization zone, including the concentration of a random droplet on a container. Instead, Steuben Foods contends, the Board should have construed the term as "the amount of sterilant in the volume of pressurized gas within the zone."

Steuben Foods' proposed construction, however, impermissibly restricts the claim term to a specific embodiment disclosed in the specification. While the specification refers to zones with "different concentration levels of gas laden sterilant (e.g., hydrogen peroxide in air)," '435 patent, col. 9 ll. 51–53, the specification also refers to residual concentration of hydrogen peroxide on the lids on the bottles, *see, e.g.*, *id.* at col. 12 ll. 44–47, and on the surface of the bottles, *see, e.g.*, *id.* at col. 11 ll. 15–17. Steuben Foods fails to point to any language in the claims or disclosure in the specification that supports its position that the claims are limited to the former but specifically excludes the latter. *See also* J.A. 14 (the Board finding that "neither the claims nor the specification limit how or where . . . the sterilant concentration levels should be assessed"). The broadest reasonable construction of "sterilant concentration levels" must, therefore, encompass both the "gas laden" (or "in air") sterilant levels as well as the residual sterilant levels on the lids of the bottles and the bottle surface, all of which are indisputably "in the plurality of zones" recited in the challenged claims. Accordingly, the Board's construction is not erroneous.

B

Steuben Foods also argues that the Board failed to identify any prior art that discloses maintaining "at least about 5 to 1" (claim 1) or "at least about 1,000 ppm to 0.1 ppm" (claim 3) ratio of sterilant concentration levels in the plurality of zones. A patent claim is unpatentable when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a).[1] Among other factual determinations, obviousness depends on the scope and content of the prior art and the differences between the prior art and the claims at issue. *In re Kubin*, 561 F.3d 1351, 1355 (Fed. Cir. 2009) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)). The Board found that the challenged claims would have been obvious to a person of ordinary skill in the art based on Scholle[2] in view of an FDA regu-

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[1] Congress amended § 103 when it passed the Leahy-Smith America Invents Act (AIA). *See* Pub. L. No. 112-29, § 3(c), 125 Stat. 284, 287 (2011). However, the pre-AIA § 103 applies here because the application that led to the '435 patent never contained a claim having an effective filing date on or after March 16, 2013, or a reference under 35 U.S.C §§ 120, 121, or 365(c) to any patent or application that ever contained such a claim. *See id.* § 3(n)(1), 125 Stat. at 293.

[2] U.S. Patent No. 4,417,607 for "Apparatus and Method for Aseptically Filling Flexible Containers," which describes a "tunnel-like, elongated chamber" "partitioned into three compartments, including a sterilizing [or spraying] compartment . . . a filling compartment" and a "drying compartment therebetween." J.A. 2066–76.

lation,[3] Biewendt (also referred to as the Bosch system),[4] and Elliott,[5] among other prior art references in the record. J.A. 20–32. Steuben Foods contends that none of these references discloses maintaining "at least about 5 to 1" or "at least about 1,000 ppm to 0.1 ppm" ratio of sterilant concentration levels in different zones.

We disagree with that contention. The Board noted that both parties agreed that Scholle's spraying compartment (analogous to the fourth sterilization zone in the '435 patent) has a higher sterilant concentration than the filling compartment (analogous to the second sterilization zone in the '435 patent). *See* J.A. 22. Scholle discloses that the specific concentration of hydrogen peroxide in the spraying zone is around 300,000 ppm, a disclosure that Steuben Foods' expert, Dr. Sharon, also acknowledged. J.A. 23; *see also* Scholle, col. 5 ll. 18–26, col. 8 ll. 8–13. The Board also credited the testimony of Nestlé's expert,

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[3] 21 C.F.R. § 178.1005(d), which provides that "[n]o use of hydrogen peroxide solution in the sterilization of food packaging material shall be considered to be in compliance if more than 0.5 part per million of hydrogen peroxide can be determined in distilled water packaged under production conditions . . . ."

[4] A reference translated from German and entitled "Report on the Type Testing of the Aseptic Filling and Sealing Plant for Glass Bottles for UHT Milk," which describes aseptic sterilization and packaging of bottles developed by the German company Robert Bosch GmbH. J.A. 2077–103.

[5] An article entitled "Microbiological Evaluation of Low-Acid Aseptic Fillers," which describes how the operational limits for several critical factors or a "window of operation" for container sterilization can be created. J.A. 2756–57.

Dr. Heldman, who stated that "to ensure consistent sterilization and residual peroxide levels, the concentration of applied sterilant must necessarily be 'maintained.'" J.A. 23. Finally, the Board found that "other prior art aseptic bottling systems recognized the importance of limiting the concentration of [hydrogen peroxide] in the filling zone in order to comply with regulatory limits" of, for instance, no more than 0.5 ppm in the United States, which warrants a "window of operation" for sterilization in the filling compartment in that vicinity. J.A. 25 (relying on the Bosch system and Elliott). Prior art thus teaches maintaining a ratio of 300,000 ppm over 0.5 ppm in the plurality of zones, which fairly suggests maintaining "at least about 5 to 1" or "at least about 1,000 ppm to 0.1 ppm" ratio of sterilant concentration levels recited in the claims.[6] Accordingly, substantial evidence supports the Board's obviousness determination.

III

We have considered the remaining arguments and find them unpersuasive. Accordingly, we affirm the Board's decision.

AFFIRMED

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[6] This comparison is based on a liquid concentration of 300,000 ppm and a residual (liquid) concentration of 0.5 ppm. *See* J.A. 23.