NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

WILLIS ELECTRIC COMPANY, LTD.,
Appellant

v.

POLYGROUP MACAU LTD. (BVI),
Cross-Appellant

2018-2125, 2018-2151

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2017-00309.

Decided: July 1, 2019

LARINA ALTON, Fox Rothschild LLP, Minneapolis, MN, argued for appellant.

ROBERT A. ANGLE, Troutman Sanders LLP, Richmond, VA, argued for cross-appellant. Also represented by DABNEY JEFFERSON CARR, IV, CHRISTOPHER FORSTNER, LAURA ANNE KUYKENDALL; DOUGLAS SALYERS, Atlanta, GA.

Before PROST, *Chief Judge,* LOURIE and DYK, *Circuit Judges.*

PROST, *Chief Judge*.

Willis Electric Co., Ltd. ("Petitioner") appeals from the Patent Trial and Appeal Board's ("the Board") final decision on inter partes review upholding the patentability of claims 2–3 and 5–10 of U.S. Patent No. 8,863,416 ("the '416 patent"). *Willis Elec. Co. v. Polygroup Macau Ltd. (BVI)*, No. IPR2017-00309, Paper 47 (P.T.A.B. May 7, 2018). Polygroup Macau Ltd. (BVI) ("Patent Owner") cross-appeals from the Board's decision invalidating claims 1 and 4 of the '416 patent as obvious. *Id.* We affirm the Board's decision as to claims 1 and 4. We vacate, however, the Board's decision as to claims 2–3 and 5–10 and remand for further consideration.

BACKGROUND

The '416 patent includes ten claims directed to electric artificial trees. '416 patent col. 2 ll. 27–30. Decorating trees, a widely held holiday tradition, often includes draping multiple light strands on tree branches and using electricity to illuminate the light bulbs. *Id.* col. 6 ll. 57–60. Conventionally, multiple light strands lie in series, with one strand connecting to the wall outlet and providing electricity to each consecutive strand. *Id.* col. 6 ll. 59–62. According to the patent, some decorators find powering light strands in this manner frustrating and cumbersome, as it requires attaching the light strands before or after placing them on the tree. *Id.* col. 7 ll. 11–13. Prior attachment requires repeatedly circling the tree with trailing light strands. *Id.* col. 7 ll. 16–19. And delayed attachment entails reaching through tree branches to electrically connect the light strands. *Id.* col. 7 ll. 19–22.

To alleviate difficulties associated with powering light strands on conventional artificial trees, the '416 patent

contemplates incorporating power transfer subsystems ("PTS") into neighboring tree-trunk sections. *Id.* col. 7 ll. 26–29. The trunk sections are mechanically connected, which in turn facilitates an electrical connection between the male end of the first trunk section's PTS and the female end of the second trunk section's PTS. *Id.* col. 7 ll. 37–41. The PTS's female end comprises "a central void for receiving [an inner] male prong of the male end and a channel void disposed around the central void for receiving [an outer] male prong." *Id.* col. 7 l. 65–col. 8 l. 2. The PTS connects to a power outlet, enabling electricity to flow from the outlet to each tree-trunk section. *Id.* col. 7 ll. 41–44. The central void contains a spring-activated contact, which presses against the central male prong to maintain the electrical connection between the tree-trunk sections. *Id.* col. 13 ll. 19–23.

Representative claim 1 recites the above-described features.

> An artificial tree, comprising:
>
> a plurality of tree trunk sections, the trunk sections forming a trunk of the artificial tree;
>
> a first power distribution subsystem disposed within an inner void of a first trunk section of the plurality of tree trunk sections, the first power distribution subsystem comprising a male end, the male end having a central prong and a channel prong; and
>
> a second power distribution subsystem disposed within an inner void of a second trunk section of the plurality of tree trunk sections, the second power distribution subsystem comprising a female end, the *female end having a central void and a channel void*, the central void having a contact device disposed at least partially therein, the contact

> device comprising one or more spring activated contact sections;
>
> wherein the central prong of the male end is configured to engage the central void of the female end and the channel prong of the male end is configured to engage the channel void of the female end to conduct electricity between the first power distribution subsystem and the second power distribution subsystem; and
>
> wherein, when the central prong engages the central void, the central prong pushes a spring activated contact section of the one or more spring activated contact sections causing the spring activated contact section to press against the central prong to maintain electrical contact between the central prong and the contact device.

Id. col. 15 l. 58–col. 16 l. 25 (emphasis added).

I

Petitioner challenged various claims of the '416 patent in inter partes review on three independent grounds. The Board instituted trial on two of the three: (1) Chen[1] in view of McLeish[2] for claims 1–10 and (2) Otto[3] in view of McLeish for claims 1–4 and 8–10. The Board found that, under its claim construction, Chen's nonprovisional disclosure failed to disclose a "channel void." However, the Board found that Chen's provisional did disclose the "channel void" limitation and rendered claims 1 and 4

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[1] U.S. Patent No. 8,454,186, which includes a nonprovisional disclosure and properly incorporates by reference Provisional Application No. 61/385,751 ("provisional disclosure").

[2] U.S. Patent No. 7,066,739.

[3] German Patent Publication No. DE8436328.

unpatentable. Further, the Board upheld the patentability of claims 2–3 and 5–10 because it determined that Petitioner failed to establish that the Chen-McLeish and Otto-McLeish combinations rendered those claims obvious.

II

Petitioner appealed the Board's construction of "channel void". Appellant's Br. 26–29. Petitioner further appealed the Board's determination that Petitioner failed to establish (1) that Chen's nonprovisional disclosure combined with McLeish rendered obvious dependent claims 2–3 and 5–10, (2) that Chen's provisional disclosure combined with McLeish rendered obvious dependent claims 2–3 and 5–10 and (3) that the Otto-McLeish combination rendered obvious claims 2–3 and 10. *Id.* at 24–25.

Patent Owner cross-appealed, arguing that substantial evidence does not support the Board's decision to invalidate claims 1 and 4 as obvious in view of the Chen provisional disclosure combined with McLeish.

We have jurisdiction over the appeal and cross-appeal under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

I

We begin our discussion with the Petitioner's appeal. We first address the Board's claim construction then turn to the Board's obviousness determinations.

A

The Board adopted Patent Owner's proposed construction of "channel void," which requires a "hollow aperture *disposed within* a portion of the female end, which may be substantially circular, offset from the central void and configured to receive and engage a portion of the male end." J.A. 8–9 (emphasis added).

"We review the Board's constructions based on intrinsic evidence de novo and its factual findings based on extrinsic evidence for substantial evidence." *HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1367 (Fed. Cir. 2017).

On appeal, Petitioner argues, as it did before the Board, that the channel void need not be disposed *within* the female end. J.A. 8; Appellant's Br. 26–28. According to Petitioner, "the claim language only states that [the female end] 'has' a void" and "[a] structure can 'have' a circular void without having an exterior boundary." Appellant's Br. 28. Thus, in Petitioner's view, a "tree trunk (or any other external wall) is sufficient to define the external perimeter of the channel void." *Id.* at 26. We disagree.

"In construing patent claims, there is a heavy presumption that the terms carry their ordinary and customary meanings as would be understood by one of ordinary skill in the art." *Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1164 (Fed. Cir. 2004). Here, it appears undisputed that "channel void" itself does not have any special meaning in the art. *See* J.A. 7. We therefore turn first to the intrinsic evidence. *See Goldenberg*, 363 F.3d at 1164 ("Where a claim term has no ordinary and customary meaning, a court must resort to the remaining intrinsic evidence . . . to obtain the meaning of that term.").

The intrinsic evidence supports the Board's construction. The claims recite "a second power distribution subsystem disposed within an *inner void* of a second trunk section of the plurality of tree trunk sections, the second power distribution subsystem comprising a female end having . . . a *channel void*." '416 patent col. 16 ll. 6–10 (emphases added). Petitioner's construction, however, does not delineate between two separately recited elements—the "inner void" of the second trunk section and the "channel void" of the female end. Yet "[w]here a claim lists elements separately, 'the clear implication of the claim language' is

that those elements are 'distinct component[s]' of the patented invention." *Becton, Dickinson & Co. v. Tyco Healthcare Grp.*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004)). Nothing in the claims suggest that "inner void" and the "channel void" can coexist as the same element.

A construction that leaves the boundaries of the claimed female end undefined, as Petitioner's construction does, also fails to appreciate and give full effect to express claim language. Claim 1 recites "the female end having a . . . channel void," '416 patent col. 16 ll. 9–10, and "the channel void of the female end," *id.* col. 16 l. 17. These claim limitations indicate that the channel void is an element of the female end. Contrary to Petitioner's position, properly construing "channel void" thus requires determining the physical boundaries of the female end.

The specification reinforces our claim analysis. As disclosed, "the channel void is circular," *id.* col. 2 l. 57, which implies that the channel void must have a circular outer boundary. Further, the specification suggests that the recited channel void lies *within* the female end. According to the specification, "use of terms such as 'having' or 'has' . . . are intended to have the same meaning as terms such as 'comprising' or 'comprises.'" *Id.* col. 6 ll. 13–17. The term "comprising" is synonymous with "containing." *Mars, Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1375 (Fed. Cir. 2004) (citing Webster's Third New Int'l Dictionary at 491 (2002)). And "[t]he ordinary meaning of 'contain' is 'to have *within*.'" *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1374 (Fed. Cir. 2002) (emphasis added) (citing Webster's Third New Int'l Dictionary at 490–491 (1966)).

In addition, as the Board noted, "[t]here is no dispute that each embodiment of the '416 patent shows the [female end] is a component separate and distinct from the tubular structure defining the body of the various 'tree trunk sections.'" J.A. 9. In each disclosed embodiment, moreover,

the channel void exists within the outer boundary of the female end. Although "particular embodiments appearing in the specification will not generally be read into the claims," *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987 (Fed. Cir. 1988), they may corroborate a particular construction, *see Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 907 (Fed. Cir. 2004).

Besides intrinsic evidence, the Board also relied on extrinsic evidence to construe "channel void." Patent Owner's expert, Dr. Lebby, testified that "the channel void includes actual structure of the 'female end,' and is not simply air or space," as Petitioner's expert, Dr. Durfee, testified. J.A. 8–9. Substantial evidence supports the Board's decision to credit Patent Owner's expert over Petitioner's expert.

Petitioner argues that under its proposed claim construction, the combination of Chen's nonprovisional disclosure and McLeish discloses a "channel void" and renders claims 2–3, and 5–10 obvious. Because we see no error with the Board's claim construction, as explained above, we disagree with Petitioner's position. Substantial evidence therefore supports the Board's finding that Petitioner failed to establish by a preponderance of the evidence that the Chen nonprovisional in view of McLeish renders claims 2–3, and 5–10 obvious.

B

Using the construction of "channel void" adopted by the Board, the Board invalidated claims 1 and 4 as obvious but upheld the patentability of dependent claims 2–3 and 5–10, finding that Petitioner failed to sufficiently establish obviousness as to those claims.

"Obviousness is a question of law based on underlying factual findings." *Impax Labs., Inc. v. Lannett Holdings Inc.*, 893 F.3d 1372, 1378 (Fed. Cir. 2018). "We review the Board's ultimate legal determination of obviousness de novo and its underlying factual findings for substantial

evidence." *Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 900 (Fed. Cir. 2018).

Petitioner argues that, even under the Board's construction, the Board erroneously upheld the patentability of dependent claims 2–3 and 5–10. The Board found that "Petitioner offer[ed] no specific contentions with respect to [those claims] in connection with the teachings of the provisional application's disclosure." J.A. 25. We agree with Petitioner that substantial evidence does not support the Board's finding.

At the outset, the Petition expressly provides that "[a]ll argument and citation for each claim and limitation from Chen Ground 1, above, is hereby incorporated and combined with [the Ground 2] arguments." J.A. 90. Ground 1 challenged claims 1–4 and 6–10 as obvious in view of Chen's nonprovisional and provisional disclosures, treated as a single reference. J.A. 43. Ground 2 asserted that the Chen disclosures in view of McLeish rendered claims 1–10 obvious. *Id.* Having determined that the provisional application is part of Chen's nonprovisional disclosure, the Board was required to conclude that Chen, as a whole, teaches a "channel void," and then determine whether it would have been obvious to incorporate the additional elements of the dependent claims, such as a power cord, based on the combined disclosure of the Chen nonprovisional and Chen provisional.

To the extent that different embodiments of Chen would need to be combined to render the dependent claims obvious, the Board overlooked certain rationales to combine provided in the Petition. For example, the Petition asserts that a skilled artisan would include an outlet disposed on the trunk section, as recited in claim 6, "to provide power to a strand of lights." J.A. 86. In another example, the Petition alleges that a skilled artisan would add alignment mechanism, as recited in claim 7, "to make the assembled tree more convenient to a consumer, as the tree

portions will not spin, disrupting decorations or other adornments of the tree." J.A. 87.

The Board erred in determining that the Petition lacked discussion of any "particular combination or modification," J.A. 25, without considering these and other proposed motivations to combine articulated in the Petition.

We therefore vacate the Board's decision as to dependent claims 2–3 and 5–10 and remand for the Board to reconsider whether these claims are obvious based on the entirety of Chen.

II

We next turn to Patent Owner's cross-appeal. Patent Owner argues that substantial evidence does not support the Board's determination invalidating claims 1 and 4 as obvious in view of Chen's provisional disclosure combined with McLeish. According to Patent Owner, the Petition lacked evidence showing that a skilled artisan would have been motivated to add the claimed spring-activated contacts to the Chen provisional's connector. Cross-Appellant's Br. 70. We disagree.

The Petition expressly incorporates by reference arguments from preceding sections of the Petition, contending that skilled artisans "would find it obvious to employ spring-activated-contact sections in the contact device and recognize how such connections function . . . to maintain electrical contact between the central prong and the contact device." J.A. 83. Those incorporated sections set forth several rationales for including spring-activated contacts—for example, "to secure a reliable electrical connection" and "to prevent arcing." J.A. 75, 79. Substantial evidence supports the Board's finding that "one skilled in the art would have found it obvious to utilize a spring-activated contact in the provisional application." J.A. 22–23.

Finally, Patent Owner's challenge to the physical incorporation of a spring-activated contact into the Chen's

provisional's connector, and its functionality, is likewise unavailing. Well-established law dictates that "[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

In sum, we reject each of Patent Owner's arguments on cross-appeal. Substantial evidence, in our view, supports the Board's determination that Chen's provisional disclosure combined with McLeish renders claims 1 and 4 obvious.

CONCLUSION

For the foregoing reasons, we affirm the Board's construction of "channel void" and its determination invalidating claims 1 and 4 as obvious. We vacate, however, the Board's decision upholding the patentability of claims 2–3 and 5–10 and remand with instructions to consider the validity of those claims in view of the asserted prior art. Consistent with this decision, we need not reach Petitioner's alternate argument on appeal that Otto in view of McLeish renders claims 2–3 and 10 obvious.[4]

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[4] Oral Arg. at 3:08–53, No. 2018-2125, http://www.cafc.uscourts.gov/oral-argument-recordings. (Q: "If we were, hypothetically, to agree with you [that the Board's decision needs to be remanded because the Board erroneously did not consider the provisional disclosure of Chen], are there still some dependent claims left unresolved that are affected by . . . the combination of Otto and McLeish"? A: "No."); Oral Arg. at 3:56–4:09 (Q: "So what

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

The parties shall bear their own costs.

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was the relevance of the Otto reference"? A: "Well, it's an alternative argument, Your Honor.").