NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

POLYGROUP LIMITED MCO,
Appellant

v.

WILLIS ELECTRIC COMPANY, LTD.,
Appellee

2018-2137

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2016-01781, IPR2016-01782.

Decided: July 1, 2019

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

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

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

PROST, *Chief Judge*.

Polygroup Limited MCO ("Polygroup") appeals from the final written decision of the Patent Trial and Appeal Board ("the Board") in an inter partes review upholding the patentability of claims 1–5, 7, 8, 11, 12, 15–18 and 21–27. Because substantial evidence does not support the Board's finding that Polygroup failed to establish a rationale to combine the prior art, we vacate and remand.

BACKGROUND

Willis Electric Co., Ltd. ("Willis") owns U.S. Patent No. 8,974,072 ("the '072 patent"), covering pre-lit artificial trees with mechanically and electrically connectable tree portions. '072 patent col. 1 ll. 14–18. Polygroup petitioned for inter partes review, alleging that Miller[1] in view of Yang[2] and Patry[3] rendered claims 1, 2, 11, 12, 15–18 and 21–27 obvious under 35 U.S.C § 103, and claims 3–5, 7, and 8 obvious under the Miller-Yang-Patry combination plus additional prior art. The petitions also explicitly argued that Miller alone teaches every element of many of the challenged claims. The Board instituted review on all challenged claims.

Two of the three administrative judges on the Board's panel ("the Majority") ultimately upheld the challenged claims, finding that (1) under its construction, Miller failed to teach a "tree portion" and (2) Polygroup failed to provide sufficient rationale to combine Miller, Yang, and Patry. The lone dissenting judge wrote separately, opining that the Majority misconstrued "tree portion" and consequently

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1 U.S. Patent No. 4,020,201.
2 U.S. Patent No. 7,132,139.
3 U.S. Patent No. 3,602,531.

erred in finding that Miller failed to teach a "tree portion." He also disagreed with the Majority's determination that Polygroup failed to show a motivation to combine by a preponderance of the evidence.

Polygroup appealed the Board's decision. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

Polygroup argues that the Board misconstrued "tree portion." Appellant's Br. 35–48. But because we have already decided that issue in Polygroup's favor in a previous appeal concerning U.S. Patent No. 8,454,186, a parent of the '072 patent, that argument has been resolved against Willis as a matter of collateral estoppel.[4] *Polygroup Ltd. MCO v. Willis Elec. Co.*, 759 F. App'x 934, 940 (Fed. Cir. 2019) (No. 2018-1745). Polygroup also argues that Miller alone renders many of the challenged claims obvious and that the Board declined to consider Miller alone. This issue has also been resolved against Willis as a matter of collateral estoppel. *Id.* at 942–43. Thus, on remand in this case, the Board must consider Polygroup's arguments based on Miller alone and reconsider its obviousness determination consistent the proper construction of "tree portion."

Polygroup also challenges the Board's motivation to combine determination. It advances three independent arguments, but we need address only two of them to resolve

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[4] Although Polygroup notified us that it anticipated an earlier decision in Appeal No. 2018-1745 would control the "tree portion" construction issue in this appeal, *see* Appellant's Br. 1, we expected more. Pertinent and significant authority came to the parties' attention after the briefing in this appeal concluded, yet both parties failed to notify the Panel about this occurrence. Rule 28(j) contemplates the submission of such supplemental authority. Fed. R. App. P. 28(j).

this appeal: Substantial evidence does not support the Board's findings as to motivation to combine, and the Board applied the law of obviousness too narrowly.[5] Appellant's Br. 55–71.

Obviousness is a legal question based on underlying facts. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2013). We review the Board's legal determinations de novo and its underlying factual findings for substantial evidence. *Id.* Whether there was a motivation to combine references is a fact question. *See Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016).

Each ground of unpatentability includes either Miller alone, or the combination of Miller, Yang, and Patry. The Board found that Miller discloses an artificial tree with "male and female plugs inside the tree trunk that [couple to] allow electricity to travel between trunk sections." J.A. 16. Instead of plugs, Yang facilitates electricity flow between trunk sections with male and female connectors fitted within the trunk sections, such that "when the trunk sections are mated, the electrical connection is also made." J.A. 16–17. The Board acknowledged that "[u]nlike the artificial tree in Miller, which must have the loose electrical plugs connected prior to connecting the trunks, Yang's design provides for a concurrent mechanical and electrical connection to be made." J.A. 17–18.

To secure the male and female connectors within the trunk sections, Yang contemplates a snap-fit connection. Flexible plates with corresponding protrusions face opposite directions on the outer side of each connector and fit

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[5] We need not reach Polygroup's other argument on appeal that the Board violated Polygroup's rights under the APA by considering arguments, for the first time in its final written decision, that Willis never made.

into locating holes in the outer wall of each trunk section. *See* J.A. 16–17. In the Board's view, Polygroup "propose[d] to eliminate the snap-fitting portion of the connector of Yang . . . and convert it into a 'compression-fitted tapered connector' as allegedly taught in Patry." J.A. 18. The Board found that Patry teaches a "tubing coupler for securely and permanently coupling two tubes," the coupler having "a tapered body to help obtain a friction fit." J.A. 18–19.

Polygroup argued before the Board that a person of ordinary skill in the art ("POSITA") would have been motivated to incorporate the tapered compression-fitted connectors of Patry into the Miller-Yang design for six distinct reasons. First, "to improve the fit of the connectors inside Miller's trunk members without needing [Yang's] locating tabs or other alignment devices." J.A. 180. Second, to "ease manufacturing while maintaining resilience in the mounting of the connection." J.A. 182. Third, to "promote insertion into the tubular sections and allow[] the connector to be compressed into the same." *Id.* Fourth, "to seal the tubes from debris." *Id.* Fifth, "to allow assembly of the connectors into the trunk portions while preventing the connector from dropping through the entire trunk segment." J.A. 182–83. And finally, to "allow for an effective insertion" even if "a trunk member is manufactured slightly too large or too small." J.A. 183.

Polygroup further contended that "compression-fit connectors were known alternatives to Yang's snap-fit connectors," J.A. 182, and the "modification would have been a substitution of one known element for another to obtain predictable results . . . [that would have been obvious to try] in light of the finite number of solutions identified in the prior art teachings with a reasonable expectation of success," J.A. 183.

The Board nonetheless rejected all of Polygroup's proposed rationales. In the Board's view, because Patry

teaches tapered connectors for mechanically joining two tubes, Polygroup provided insufficient evidence that a POSITA would have tapered electrical connectors to join *electrical components inside* two tubes. J.A. 22–23. Although Polygroup's expert opined otherwise, the Board remained unpersuaded that tapered, compression-fit electrical connectors and snap-fit electrical connectors were known alternatives to each other. J.A. 23–25. According to the Board, the prior art references on which Polygroup's expert relied "all belie [Polygroup's] assertions and its expert's opinions that it was known to use a [compression-fit] electrical connector in the manner proposed in the combination." J.A. 25.

The Board further rejected Polygroup's argument that tapering eases manufacturing and assembly. It first questioned whether such concerns would sufficiently motivate a POSITA to convert Yang's snap-fit connector into what it characterized as "an entirely new type of connector." J.A. 28. It next determined that Polygroup's evidence and technical reasoning failed to support the proposition that the modified design is easier to manufacture and assemble than Yang's design. *See* J.A. 28–29.

Lastly, because Polygroup's proposed modification requires pushing the compression-fit connectors into the trunk sections, the Board expressed concern that "one plug may be pushed further back into the tube (e.g., due to the force of mating the electrical plugs) and no longer be properly located to permit the electrical connection." J.A. 30. Recognizing that several prior art references teach physical protrusions for retaining connectors at certain locations, the Board concluded that "[Polygroup's] proposal to use a [compression-fit] connector without such an obstruction diverges from the art" and "further indicat[es] that the proposed combination would not have been obvious." J.A. 31.

Substantial evidence does not support the Board's findings. As an initial matter, the Board appears to have misunderstood Polygroup's proposed rationale for tapering Yang's electrical connectors. Polygroup explained that the proposed "fitted connector arrangement advantageously allows a user to simultaneously electrically connect and *mechanically couple* the trunk sections." J.A. 180 (Petition) (emphasis added). So, the Board's distinction between a tapered connector for joining two tubes and a tapered connection for joining electrical components *inside* two tubes is inapplicable here.

Moreover, the Board's finding that Polygroup's modification does not use a tapered connector in the same way that Patry teaches, *see* J.A. 22, contradicts its earlier finding that "[t]he coupler of Patry has . . . a tapered body to help obtain a [compression-fit]," J.A. 19, and Polygroup's proposed modification "convert[s]" Yang's snap-fit connector "into [Patry's] 'compression-fitted tapered connector,'" J.A. 18. We do not regard such internally inconsistent findings as supported by substantial evidence. *See Honeywell Int'l Inc. v. Mexichem Amanco Holding S.A. De C.V.*, 865 F.3d 1348, 1354 (Fed. Cir. 2017) (finding the Board's analysis flawed due to internal inconsistencies).

Next, the Board applied the law of obviousness too narrowly when analyzing Polygroup's ease of manufacturing and assembly rationales. While the Board explained its finding that the prior art on which Polygroup's expert relied did not support easier manufacture and assembly, the Board failed to consider other acceptable sources of motivation. "[E]vidence of a motivation to combine need not be found in the prior art references themselves, but rather may be found in 'the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved.'" *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1366 (Fed. Cir. 2006) (quoting *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999)). The Board failed to explain its decision to discount Polygroup's

evidence concerning the knowledge and skill of a POSITA and failed to consider the nature of the problem when analyzing the sufficiency of the proposed rationales. The Board must do so on remand.

As for the Board's "push-through" concern, the prior art inventions need not be physically combinable to render a claim obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016). "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference" but rather whether a "skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention." *Id.* (quoting *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) and *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007)).

Upon tapering Yang's connector and removing its snap-fit components, it appears that a POSITA could well have been motivated to modify the connector to maintain its axial position within the trunk section. Certain prior art references may have taught physical obstruction to prevent displacement within the tube, J.A. 30–31, but such obstructions are not necessarily compulsory to accomplishing the desired result. Nor is such physical obstruction required by the claims. As the Board itself explained, "[b]ecause [Polygroup's] proposed modification to Yang is simply to remove the locating snap-fit structures, [it] necessarily requires that the press-fit be sufficiently tight to positively maintain the location of the electrical connectors inside the tubes." J.A. 21 n.11. We therefore reject this reasoning as a basis for finding no motivation to combine.

CONCLUSION

In sum, we vacate the Board's obviousness determinations on all challenged claims of the '072 patent because the Board erroneously construed "tree portion" and failed to consider whether those claims are unpatentable in view

of Miller alone, and substantial evidence does not support its factual findings regarding lack of motivation to combine. We remand with instructions to consider whether the challenged claims are invalid in light of this opinion.

VACATED AND REMANDED

COSTS

The parties shall bear their own costs.