NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

C.R. BARD, INC., BARD PERIPHERAL VASCULAR, INC.,
Appellants

v.

ANGIODYNAMICS, INCORPORATED,
Cross-Appellant

2017-1851, 2017-1865, 2017-1906, 2017-1931, 2017-1943

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. 95/002,089, 95/002,090, 95/002,092.

Decided: September 28, 2018

VINCENT JOSEPH BELUSKO, Morrison & Foerster LLP, Los Angeles, CA, argued for appellants. Also represented by NICOLE MARIE SMITH; SETH W. LLOYD, BRIAN ROBERT MATSUI, Washington, DC.

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J. SEBBA.

ALFRED W. ZAHER, Buchanan Ingersoll & Rooney PC, Philadelphia, PA, for amicus curiae Medical Components, Inc. Also represented by RALPH GEORGE FISCHER, Pittsburgh, PA.

Before O'MALLEY, TARANTO, and STOLL, *Circuit Judges*.

O'MALLEY, *Circuit Judge*.

These consolidated appeals involve three of C.R. Bard, Inc.'s and Bard Peripheral Vascular, Inc.'s (collectively, "Bard's") medical device patents. In several inter partes reexamination proceedings requested by AngioDynamics, Inc., the Patent Trial and Appeal Board invalidated thirty-four of the patents' forty-one claims as anticipated and/or obvious over the prior art.[1] Both parties appealed various aspects of the Board's rulings.

With respect to the Board's decision that a particular prior art reference qualifies as a "printed publication"

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[1] *See AngioDynamics, Inc. v C.R. Bard, Inc.*, Appeal 2015-001533, 2016 WL 923521 (P.T.A.B. Mar. 10, 2016) ("'302 Decision"); *AngioDynamics, Inc. v C.R. Bard, Inc.*, Appeal 2015-001533, 2017 WL 542597 (P.T.A.B. Jan. 31, 2017) ("'302 Rehearing Decision"); *AngioDynamics, Inc. v C.R. Bard, Inc.*, Appeal 2015-004554, 2016 WL 1239176 (P.T.A.B. Mar. 28, 2016) ("'022 Decision"); *AngioDynamics, Inc. v C.R. Bard, Inc.*, Appeal 2015-004554, 2017 WL 766740 (P.T.A.B. Feb. 17, 2017) ("'022 Rehearing Decision"); *AngioDynamics, Inc. v C.R. Bard, Inc.*, Appeal 2015-004506, 2016 WL 1166545 (P.T.A.B. Mar. 24, 2016) ("'615 Decision"), *AngioDynamics, Inc. v C.R. Bard, Inc.*, Appeal 2015-004506 (P.T.A.B. February 21, 2017) (J.A. 146) ("'615 Rehearing Decision").

under 35 U.S.C. § 102(b), we *vacate* and *remand* for the Board to clarify its findings. We also conclude that some of the Board's anticipation and obviousness rulings are predicated on an erroneous claim construction. As to these rulings, we *reverse* the Board's anticipation findings and *remand* certain of its obviousness findings for further consideration under the proper construction and in light of any further findings on the printed publication question. We *affirm* in all other respects.

I. BACKGROUND

C.R. Bard, Inc.'s and Bard Peripheral Vascular, Inc.'s U.S. Patent Nos. 7,785,302 ("'302 patent"), 7,947,022 ("'022 patent"), and 7,959,615 ("'615 patent"), all titled "Access Port Identification Systems and Methods," are related by way of a provisional application filed in March 2005, and have similar specifications.[2] The patents describe medical devices, called access ports, implanted beneath a patient's skin to enable direct access to a central vein for delivery of medicine or other fluids. '302 patent, col. 1, ll. 13–19. These ports typically include a bio-compatible housing, a septum, and a cavity. Once the port is implanted, a doctor punctures the patient's skin and the septum with a needle to deliver fluid into the cavity. The fluid is then transmitted from the cavity into a catheter, which is sutured to one of the patient's central veins. For patients requiring frequent and long-term intravenous therapy, these devices allow medical professionals to easily and repeatedly access a major vein without having to go through tissue or muscle each time.

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[2] The '615 patent and '022 patent are a continuation and continuation-in-part of the '302 patent, respectively. For simplicity, we cite only to the specification of the '302 patent unless otherwise specified.

The patents explain that prior art "access ports of different manufacturers or models . . . typically exhibit[ed] substantially similar geometries." *Id.* col. 1, ll. 46–49. Because of these similarities, doctors were unable to identify and distinguish specific types of ports after they were implanted. This prevented doctors from distinguishing so-called "power injectable ports" from ordinary ones. Power injectable ports are designed to be "injected and pressurized by mechanical assistance" at high flow rates. *Id.* col. 3, ll. 43–47. By contrast, regular access ports are not manufactured to withstand high-pressure injections. Power injecting a non-power injectable port can cause the port to fracture while in the patient's body, leading to serious bodily injury or even death.

The patents generally describe access ports having "at least one identifiable characteristic that may be sensed or otherwise determined subsequent to subcutaneous implantation." *Id.* col. 1, ll. 55–58. In some embodiments, the "identifiable characteristic" is a message that "may be perceived via x-ray or ultrasound imaging." *Id.* col. 4, ll. 15–24. In other embodiments, medical professionals can use the port's geometry to identify whether the port is power injectable by touch, even after it is implanted.

The patents collectively recite forty-one claims, which the parties classify into two partially overlapping groups. In the first group, which includes all claims of the '302 and '022 patents, the identifiable characteristic is a "radiopaque alphanumeric message." The message is opaque to radiation, so it is visible on an x-ray, and "indicat[es] that the assembly is power injectable." *Id.* col. 13, ll. 18–19. Claim 5 of the '302 patent is representative of these "radiopaque claims":

> 5. A venous access port assembly for implantation into a patient, comprising:
>
> a housing having an outlet, and

> a needle-penetrable septum, the needle-penetrable septum and the housing together defining a reservoir,
>
> wherein:
>
> > the assembly includes a radiopaque alphanumeric message observable through interaction with X-rays subsequent to subcutaneous implantation of the assembly, and
> >
> > *the alphanumeric message indicating that the assembly is power injectable*.

Id. col. 13, ll. 8–19 (emphasis added).

In the second group of claims, which includes all claims of the '615 patent, the identifiable feature is one or more "concave side surfaces" that curve inward toward the port housing. Like the alphanumeric message in the radiopaque claims, a concave side allows a doctor to identify the access port, albeit by palpation, after implantation. Claim 1 of the '615 patent is representative of these "concave side" claims:

> 1. An access port for providing subcutaneous access to a patient, comprising:
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> > a body defining a cavity accessible by inserting a needle through a septum, the body including a plurality of side surfaces and a bottom surface bounded by a bottom perimeter, the bottom surface on a side of the port opposite the septum, the bottom perimeter including a concave portion, the side surfaces including a first side surface through which an outlet stem extends; and

> at least one structural feature of the access port identifying the access port subsequent to subcutaneous implantation as a particular type of access port, the at least one structural feature comprising *a concave side surface in a second side surface different from the first side surface*, the concave side surface extending to the bottom perimeter concave portion.

Id. col. 12, ll. 52–67 (emphasis added).

In August 2012, AngioDynamics filed three requests for inter partes reexamination of the '302, '022, and '615 patents, challenging all forty-one claims. A patent Examiner granted the requests as to all but one claim. In a series of decisions, the Board ultimately affirmed in part and reversed in part, holding thirty-four of the forty claims addressed by the Examiner invalid as anticipated and/or obvious over the prior art of record.[3] Both parties filed requests for rehearing, which were denied.

Bard and AngioDynamics timely appealed and cross-appealed various aspects of the Board's decisions. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II. DISCUSSION

We review the Board's conclusions of law de novo and its findings of fact for substantial evidence. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). Substantial

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[3] The Board invalidated claims 5–10 of the '302 patent, claims 1–20 of the '022 patent, and claims 1–5 and 8–10 of the '615 patent. *See* '302 Decision, 2016 WL 923521, at *21; '022 Decision, 2016 WL 1239176, at *21; '615 Decision, 2016 WL 1166545, at *16. The Board upheld claims 1–4 of the '302 patent and claims 6–7 of the '615 patent. *Id.*

evidence is "such evidence as a reasonable mind might accept as adequate to support a conclusion." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1347 (Fed. Cir. 2012). But our review of the Board is also rooted in "basic principles of administrative law." *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 992 (Fed. Cir. 2017). The Board must therefore provide conclusions that "suffice for us to see that the agency has done its job and must be capable of being reasonably . . . discerned from a relatively concise . . . discussion." *In re NuVasive*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (internal quotation marks omitted). If it does not, then we may not be able to determine whether the Board's findings are supported by substantial evidence. In that case, remand may be appropriate. *See, e.g., Pers. Web.*, 848 F.3d at 994 (remanding for the Board to "reconsider the merits of the obviousness challenge" where the Board's analysis was insufficient to permit meaningful judicial review).

A. Bard's Appeal

Bard makes several arguments for why we should reverse the Board's rulings invalidating claims 5–10 of the '302 patent, claims 1–20 of the '022 patent, and claims 8–9 of the '615 patent. First, with respect to the '302 and '022 patent claims, Bard argues that the Board erred in concluding that a particular prior art reference used to invalidate those claims qualifies as a "printed publication" under 35 U.S.C. § 102(b).[4] Second, Bard argues that the Board erred in construing certain claims to encompass both power injectable and non-power injectable access

[4] All of the patents at issue here have an effective filing date before the effective date of the Leahy-Smith America Invents Act ("AIA"), references are therefore to the pre-AIA version of 35 U.S.C. § 102. See Pub L. No. 112-29, 125 Stat. 284 (2011); 35 U.S.C. § 102 (2006).

ports. Finally, Bard argues that the Board improperly entered a new ground of rejection in violation of the Administrative Procedure Act ("APA"). We address each argument in turn.

1. Printed Publication

A reference qualifies as a printed publication under § 102(b) if the reference was "sufficiently accessible to the public interested in the art." *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016). "A reference is considered publicly accessible if it was 'disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.'" *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009) (quoting *Kyocera Wireless corp. v. ITC*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)). Public accessibility is determined case-by-base depending on the "facts and circumstances surrounding the reference's disclosure to members of the public." *Id.* Whether a reference ultimately qualifies as a printed publication is a question of law based on underlying findings of fact. *Blue Calypso*, 815 F.3d at 1348.

Bard challenges the Board's determination that a certain reference, *IsoMed Constant-Flow Infusion System* ("IsoMed"), is a "printed publication" under 35 U.S.C. § 102(b).

IsoMed is a clinical reference guide that was developed by third party Medtronic, Inc. "for physicians and allied professionals who care for patients using" Medtronic's implantable reciprocating IsoMed pump device "for hepatic arterial infusion of chemotherapeutic agents." J.A. 512. The guide bears a 2000 copyright date and indicates that it was revised in September 2000, years before the asserted patents' March 2005 priority date.

Analyzing the content of the guide, the Board found that the guide was prepared "for distribution to physicians and allied professionals rather than for internal or restricted use within Medtronic." '302 Decision, 2016 WL 923521, at *6.[5] The Board also considered the declaration of Hank LaForce, a sales representative of a medical products company later acquired by AngioDynamics. LaForce said that, beginning in or around January 2001, his employer "co-promoted" the IsoMed device with Medtronic. J.A. 1665. LaForce also stated that he "personally distributed numerous copies of the . . . publication to interested medical professionals, including doctors, nurses, surgeons, radiologists, oncologists, and other medical clinicians," and that there "were no restrictions or limitations on distribution of the . . . publication." *Id.* Although the Board noted that the declaration included "limited" detail and that LaForce may have been biased "due to current employment by" AngioDynamics, it nevertheless determined that the guide was publicly accessible as of January 2001. '302 Decision, 2016 WL 923521, at *6.

Based on the current state of the record and the Board's articulated findings of fact, we cannot determine whether the Board's findings are supported by substantial evidence.

On the one hand, the Board noted that the IsoMed guide bears some indicia of a public-facing document. For example, it lists phone numbers for customer and technical service departments within Medtronic as well as contact information for various Medtronic offices. *See id.* This suggests that the publication served as a reference

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[5] As Bard points out, the Board's decisions on this issue for the '302 and '022 patents "are largely word-for-word identical . . . [and] stand or fall together." Appellant Br. 20. We therefore only cite the Board's decision relating to the '302 patent unless otherwise noted.

guide for healthcare professionals outside of Medtronic. While Bard criticizes the Board for relying on the document, the contents of a document can be relevant to whether the document was publicly accessible. *See, e.g., Nobel Biocare Servs. AG v. Instradent USA, Inc.*, No. 2017-2256, 2018 WL 4354227, at *6–9 (Fed. Cir. Sept. 13, 2018) ("[T]he ABT Catalog has the date 'March 2003' on its cover. Although the ABT Catalog's date is not dispositive of the date of public accessibility, its date is relevant evidence that supports the Board's finding of public accessibility . . . .").

On the other hand, the only other evidence in the record—the LaForce declaration—does little to establish that the document was publicly accessible. At most, LaForce says he distributed an unidentified number of copies on an unidentified date to unidentified people. The Board's findings regarding the declaration, moreover, are ambiguous. For example, the Board acknowledged LaForce's statement that he distributed copies of IsoMed without making an express finding that he did so. *See* '302 Decision, 2016 WL 923521, at *6 ("LaForce . . . testifies to having distributed 'numerous copies' of IsoMed . . . ."). Instead, the Board seemed to credit LaForce's testimony that clinicians could *request* copies from Medtronic. *See id.* ("LaForce infers that IsoMed was available to any member of the relevant public who requested a copy . . . we find that LaForce's inference is sound."). It is therefore unclear whether and to what extent the Board relied on or credited LaForce's testimony regarding his purported distribution. *See, e.g., id.* at *10 ("We find that IsoMed was available to the relevant public as of on or around January 2001; and that interested members of the relevant public could have obtained a copy of IsoMed if they wanted to obtain one. Based on these findings, we find by a preponderance of

the evidence that IsoMed was publically [sic] accessible on or around January 2001." (citations omitted)).[6] It is also unclear whether, even if a member of the relevant public could have requested it, there is any evidence that they would have had a reason to do so.

AngioDynamics asks us to assume the Board found that IsoMed was distributed along with IsoMed devices. *See* Oral Arg. at 20:22–23:20 ("Counsel: Medical devices are typically sold with product manuals. Court: Where is that in the record? Counsel: The Board inferred it . . . ."), *available at* http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2017-1851.mp3. We see no factual findings or record evidence to support this. LaForce's declaration says nothing about whether Medtronic distributed the guide and device together or whether it was even common practice for medical device manufactures to do so. This case therefore stands in contrast to *In re Enhanced Security Research, LLC*, 739 F.3d 1347 (Fed. Cir. 2014), on which AngioDynamics relies. There, the Board credited a declaration explaining that the manual at issue was associated with a software product "sold to or installed for approximately a dozen customers." *Id.* at 1354–55. In view of the manual's inscription date, the declaration, and evidence of the software product's advertisements published during the relevant timeframe directing relevant consumers to reach out for more information, we concluded that substantial evidence supported the Board's finding that the manual constituted publicly-available prior art under § 102(a)(1). *Id.* And, we found that there was a sufficient basis to

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[6] The Board's decisions on rehearing with respect to the '302 patent and the '022 patent do not mention the LaForce declaration at all. *See generally* '302 Rehearing Decision, 2017 WL 542597; '022 Rehearing Decision, 2017 WL 766740.

conclude that consumers would have had a reason to reach out and request it. *Id.* Here, in the absence of clear factual findings, we decline to decide whether the present record would support the same inference.

Accordingly, we *vacate* the Board's determination that IsoMed qualifies as a printed publication and *remand* for additional factfinding on this score.[7]

2. Claim Construction

We review the Board's claim constructions de novo except to the extent they depend on underlying factual findings involving extrinsic evidence. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015).

As described above, the radiopaque claims of the '302 and '022 patents require the recited access port to contain a radiopaque "alphanumeric message indicating that the assembly is power injectable." Claims 8–9 of the '615 patent include a similar limitation. The Board determined that these claims are broad enough to encompass both power injectable and non-power injectable ports. *See, e.g.,* '615 Decision, 2016 WL 1166545, at *13. Bard contends that these claims require the access port to be power injectable and that the Board erred by holding otherwise. We agree.

"As with any claim construction analysis, we begin with the claim language." *In re NTP, Inc.*, 654 F.3d 1279, 1288 (Fed. Cir. 2011) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)). Here, the plain language of the radiopaque claims is clear. For example, claim 5 explains that the alphanumeric message "indicat[es] that the assembly is power injectable." '302

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[7] We express no opinion as to whether the Board may or should consider additional evidence to support this additional factfinding.

patent, col. 13, ll. 8–19. This phrasing is definitional. Claim 8 of the '615 patent likewise explains that the recited structural feature "identif[ies] the access port as being power injectable." '615 patent, col. 14, ll. 1–3. We therefore interpret these claims to "mean precisely what they say," *Central Admixture Pharmacy Services, Inc. v. Advanced Cardiac Solutions, P.C.*, 482 F.3d 1347, 1355 (Fed. Cir. 2007), and we construe them to mean that the claimed access port is power injectable.

To justify its contrary construction, the Board concluded that the claims merely require that the access port be *labeled* as power injectable. The Board based this conclusion on its view that "it was within the level of ordinary skill in the art to falsely label an assembly that was not power injectable." '302 Decision, 2016 WL 923521, at *15. But the Board provided no reason why the claims would contemplate a falsely labeled access port. As the record evidence makes clear, power injecting a non-power injectable port can cause serious injury or death. Distinguishing between the two types of ports is the crux of what the patents claim. The Board's reading of the claims as reaching falsely labeled ports is therefore unreasonably broad. *See PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 747, 755 (Fed. Cir. 2016) ("We will not adopt the position . . . that the broadest reasonable construction is always the one which covers the most embodiments. Above all, the broadest reasonable interpretation must be reasonable in light of the claims and specification.").

That the claims cover power injectable ports, specifically, is further evidenced by the prosecution history of the '302 patent. For example, claim 5 originally required "at least one feature [that] conveys information indicative of an attribute of the assembly." J.A. 8400. After the Examiner rejected the claim, the Examiner and the applicant conducted an interview in which they "[d]iscussed potential amendments to independent claims

to . . . further describ[e] the port and the attribute as being power injectable." J.A. 8598. The applicant then amended the claim to add the alphanumeric message limitation at issue here. J.A. 8602. The Examiner ultimately allowed this claim, stating that "the prior art of record fails to disclose either singly or in combination the claimed device of an implantable access port that has a radiopaque message to indicate that *this port is specifically power injectable*." J.A. 8775 (emphasis added). This exchange demonstrates that the applicant and the Examiner both believed the claim language covered power injectable ports, which is consistent with the plain language of the claim. *See Phillips*, 415 F.3d at 1317 (noting that the "prosecution history provides evidence of how the PTO and the inventor understood the patent"); *MasterMine Software, Inc. v. Microsoft Corp.*, 874 F.3d 1307, 1312 (Fed. Cir. 2017) (finding that a statement "presented by the inventor during patent examination is relevant to claim construction, for the role of claim construction is to capture the scope of the actual invention that is disclosed, described, and patented," even if the statement does not amount to a disclaimer).

Accordingly, we vacate the Board's obviousness rulings regarding claims 5–10 of the '302 patent, claims 1–20 of the '022 patent, and claims 8–9 of the '615 patent. We *remand* for the Board to determine, if appropriate,[8] whether, under the correct construction, these claims are obvious in view of the prior art of record.[9]

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[8] This remand assumes that the Board first finds sufficient evidence in the record upon which it can base relevant findings on the question of whether the IsoMed reference constitutes prior art as to these patents.

[9] We also decline to address, at this point, whether the alphanumeric message limitation, as properly construed, ought to be afforded patentable weight under the

3. New Grounds for Rejection

Finally, Bard argues that the Board improperly relied on new grounds to reject claims 1–5 and 8–10 of the '615 patent. We disagree.

Under the APA, the Patent Office "must assure that an applicant's petition is fully and fairly treated at the administrative level." *In re Kumar*, 418 F.3d 1361, 1367 (Fed. Cir. 2005). "This framework limits the Board's ability to rely on different grounds than the examiner." *Rambus Inc. v. Rea*, 731 F.3d 1248, 1255 (Fed. Cir. 2013). But it does not require the Board to merely recite and repeat an examiner's findings on review. "The ultimate criterion is whether the appellant has had before the PTO a 'fair opportunity to react to the thrust of the rejection.'" *Id.*

Here, the Examiner relied, in relevant part, on two references to invalidate the claims at issue: (1) European Patent Application No. 1 238 682 to Reuter ("Reuter") and (2) U.S. Patent No. 5,919,160 to Sanfilippo ("Sanfilippo"). Reuter discloses an access port with a base plate having concave cutouts that can be used to securely handle the port during implantation. Sanfilippo discloses a dual-reservoir port having curved indentations on the sides thereof that allow a doctor to determine, via palpation, the reservoirs' relative orientation. The Examiner found that it would have been obvious to use Reuter's cutouts "to impart to the medical technician the type of implanted

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printed matter doctrine. Even if entitled to patentable weight, the Board would still need to determine whether the claim as a whole is obvious in light of any relevant prior art. Since that question likely will be addressed in the Board's obviousness assessment, or be mooted by a finding that IsoMed is not prior art, we need not reach it now.

access port" and that general knowledge in the art, as evidenced by Sanfilippo, "includes relaying information regarding the port to the medical technician via palpation." J.A. 7641. The Examiner emphasized that incorporating Sanfilippo into Reuter "would be an obvious extension of this knowledge in the art." J.A. 7642. These statements suggest the Examiner found that Sanfilippo could be used to modify Reuter's cutouts to be identifiable by palpation.

The Board likewise found that it would have been obvious to modify Reuter in this respect based on Sanfilippo. For example, the Board explained that "Sanfilippo would have provided one of ordinary skill in the art reason to lower the profile of Reuter's access port, by shortening the housing, so as to enable a physician or allied professional to feel the concave side surfaces formed by the cut-outs after implantation." '615 Decision, 2016 WL 1166545, at *12. As the Board noted, this analysis at most "merely made explicit what was implicit in the Examiner's reasoning." '615 Rehearing Decision, J.A. 157. We agree. The Board's ruling does not amount to a new rejection.

Bard asserts that even if the Board's rejection was procedurally proper, it was still erroneous. According to Bard, there is no evidence in the record explaining why one skilled in the art would have been motivated to apply the teachings of Sanfilippo to modify Reuter. Bard also maintains that, even if there were such a motivation, the Board failed to address whether there would have also been a reasonable expectation of success in making these modifications.

We review the Board's findings on these factual questions for substantial evidence. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1366 (Fed. Cir. 2016). As explained above, the Board found that the prior art, including Sanfilippo, taught using structural features to identify the type of port being implanted. *See* '615

Decision, 2016 WL 1166545, at *11 ("Sanfilippo also taught that these curved indentions might be used to identify a particular type of access port . . . ."). It went on to conclude that this prior art would have provided ample motivation for a skilled artisan to modify Reuter and "enable a physician or allied professional to feel the concave side surfaces formed by the cut-outs *9*, *10* after implementation." *Id.* at *12. The Board also concluded that if this were done, "the physician or allied professional could use the cut-outs to identify the particular type of access port in accordance with the teachings of Sanfilippo." *Id.* Substantial evidence supports these determinations. We therefore *affirm* the Board's ruling invalidating claims 1–5 and claim 10 of the '615 Patent. As to claims 8–9, we *remand* for the Board to determine whether, under the correct construction, these claims are obvious in view of the prior art of record.

B. AngioDynamics' Cross-Appeal

In its cross-appeal, AngioDynamics argues that the Board's rulings upholding the validity of claims 1–4 of the '302 patent and claims 6–7 of the '615 patent should be reversed. With respect to the '302 patent claims, AngioDynamics argues that the Board erred in finding that IsoMed does not disclose a radiopaque alphanumeric message on a "housing base." With respect to the '615 patent claims, AngioDynamics argues that the Board erred in concluding that it would not have been obvious to modify Reuter to add a fourth concave side. We address each argument in turn.

1. Housing Base Limitation

AngioDynamics first challenges the Board's finding that IsoMed does not disclose an alphanumeric message on a "housing base," as required by certain radiopaque claims. According to AngioDynamics, that finding was predicated on an erroneous construction of the "housing

base" limitation. Even assuming without deciding that IsoMed qualifies as a printed publication, we disagree.

Some of the radiopaque claims recite a "housing having a housing base defining a bottom wall of at least one reservoir, and an outwardly facing bottom surface." '302 patent, col. 12, ll. 57–67. These claims also require the radiopaque alphanumeric message be inscribed on the housing base. The Board construed this limitation to mean that the housing base defines a bottom wall of the reservoir *and* an outwardly facing bottom surface of the access port. *See* '302 Decision, 2016 WL 923521, at 13–14. This construction is reasonable in light of the claims themselves and the patent as a whole. For example, claim 3, which depends from claim 1, requires that "the radiopaque alphanumeric message [be] applied to the outwardly facing bottom surface *of the housing base*." '302 patent, col. 13, ll. 3–5 (emphasis added). This language makes clear that the outwardly facing bottom surface of claim 1 is a feature of the housing base, not just the housing. *See Phillips*, 415 F.3d at 1314–15 (noting that dependent claims can add helpful context for the meaning of independent claims). It also forecloses the argument raised by amicus curiae Medical Components, Inc. ("MedComp") that the "housing base" and "an outwardly facing bottom surface" are two separate claim limitations based on the comma separating these parts of the claim.

The IsoMed device includes, among other things, a reservoir, a partition separating the reservoir from a propellent chamber that is filled with pressurized gas, and a titanium shell. The reservoir expands within the shell as pressure changes. In its most expanded state, the reservoir's lower wall abuts the lower wall of the shell.

The Board determined that IsoMed's shell cannot be a "housing base" because, although it defines an "outwardly facing bottom surface" of the access port, it does not define

"a bottom wall of the reservoir" as required under its reading of the claims. The Board determined that the reservoir's bottom wall is likewise not a "housing base" because it does not define "an outwardly facing bottom surface" of the access port. The Board therefore properly concluded that the IsoMed device does not have a structure defining both the bottom wall of the reservoir *and* the outwardly facing bottom surface of the port. *See* '302 Decision, 2016 WL 923521, at 13–14.

AngioDynamics insists that the bottom wall of the reservoir is defined by the outwardly facing shell. To overcome the fact that a partition separates the bottom wall of the reservoir from the shell, AngioDynamics argues that the partition is simply an additional, intermediate structure permitted by the "comprising" language of the claims. But as the Board correctly explained, "the fact that the bottom wall of the titanium shell . . . set[s] a limit beyond which the reservoir cannot expand does not imply that the bottom wall of the shell defines a bottom wall of at least on reservoir in the ordinary sense of the language." '302 Rehearing Decision, 2017 WL 542597, at *4 (internal quotation marks and brackets omitted). The shell therefore does not satisfy the claim.

AngioDynamics also argues that the Board's reading of these claims is inconsistent with its reading of claims 5–6 and 8–10 of the '302 patent. When analyzing those claims, the Board stated that "it is reasonable to interpret the term 'housing' sufficiently broadly to encompass [IsoMed's] combination of the titanium shell with the propellant chamber and pump device as well as other structure which might contact the reservoir." '302 Decision, 2016 WL 923521, at *13. And, in its decision on rehearing, the Board stated with respect to those claims that "the term 'defining' in the '302 patent is sufficiently broad to encompass structures that do not contact the reservoir directly; and the reservoir cannot expand so as to exceed the confines of the interior of the shell." '302

Rehearing Decision, 2017 WL 542597, at *6. AngioDynamics asserts that the Board's broad reading of "housing" is inconsistent with its narrow reading of "housing base." We see no inconsistency. While the port housing encompasses a number of components, as the claims make clear, the housing *base*, which is one part of the housing, does not.

We have considered AngioDynamics' and MedComp's remaining arguments—including those invoking judicial estoppel—and find them unpersuasive. We therefore *affirm* the Board's ruling upholding claims 1–4 of the '302 patent.

2. Obviousness

AngioDynamics next challenges the Board's ruling upholding claims 6–7 of the '615 patent. According to AngioDynamics, that ruling is predicated on an incorrect reading of the claims and an erroneous application of obviousness law. We disagree.

Claim 6 of the '615 patent requires four "concave side surfaces" in the body of the access port. '615 patent, col. 13, ll. 13–16. Prior art reference Reuter discloses three cutouts in its base plate. The Examiner concluded that it would have been obvious to modify Reuter to add a fourth concave side because doing so would have resulted in easier and cheaper manufacturing. The Board rejected this conclusion, noting the absence of any evidence to support the Examiner's view. The Board explained that adding an additional concave side to Reuter "would have required one of ordinary skill to add a cut-out to Reuter's base plate *2*, which offered no apparent functional advantage." '615 Decision, 2016 WL 1166545, at *15. While the Board acknowledged that other references in the art contained four concave surfaces, it emphasized the lack of evidence to support a motivation for combining these references with Reuter in this way. *Id.* As noted above, we review the Board's findings on these factual questions

for substantial evidence. *Intelligent Bio-Sys.*, 821 F.3d at 1366.

AngioDynamics argues that the Board erred in its obviousness analysis by requiring the prior art to teach palpating concave surfaces post-implantation. We disagree. As the Board correctly observed, while the prior art provides reasons why it would be advantageous to have concave cutouts generally, it does not suggest that having such cutouts on all sides of an access port is advantageous. Reuter itself explains that its cutouts are used so that the port "can be handled securely during implantation and especially during the fastening of the catheter." J.A. 6976. There is no reason why this benefit cannot be achieved with only three cutouts. Another reference discussed by the Board, Montalvo, states that "[t]he overall size and shape of the infusion port and its implanted location within the patient are chosen for relatively simple and accurate palpable identification through the skin." J.A. 7078. This reference clearly suggests that the geometry of the port can be chosen to optimize palpable identification, but it does not suggest that having four concave sides would achieve that benefit. Neither Reinicke nor Sanfilippo provide such a motivation either. The fact that the prior art did not teach palpation using concave surfaces post-implantation therefore undermines the notion that a skilled artisan would be motivated to modify Reuter to add a fourth concave cutout, which is what the Board found. '615 Decision, 2016 WL 1166545, at *15–16.

AngioDynamics' argument that the Board required the prior art to disclose specific functionality even though the art disclosed relevant structure similarly fails. Again, the Board discussed the functionality of the prior art to explain why a skilled artisan would not necessarily modify Reuter based on Reinicke. *See* '615 Rehearing Decision, J.A. 152 ("These structural and functional differences [between Reinicke and Reuter] reinforce the

absence of an apparent reason why one of ordinary skill in the art might have altered Reuter's access port in the fashion claimed in claim 6."). Such a discussion is appropriate. *See, e.g., Anacor Pharm., Inc. v. Iancu*, 889 F.3d 1372, 1385 (Fed. Cir. 2018) ("The obviousness inquiry often depends on whether there is evidence demonstrating a nexus between structural similarities (or dissimilarities) and functional similarities (or dissimilarities).").

AngioDynamics' argument that the Board failed to consider the collective teachings of the prior art is also without merit. The Board discussed the prior art extensively. *See, e.g.,* '615 Rehearing Decision, J.A. 150–154. It went on to conclude that the art did not provide a motivation to modify Reuter by adding a fourth concave edge. *See, e.g., id.* at 153 ("The mere presence of such concave surfaces, without indication of their function, would not have provided one of ordinary skill in the art reason to add a fourth concave cut-out to the base plate of the access port described by Reuter."). This finding is supported by substantial evidence.

Finally, AngioDynamics argues that modifying a geometric shape was well within the capabilities of a skilled artisan and would have been a simple design choice. But the Board concluded that the record evidence did not support this view. *Id.* at 150–51 ("Neither the Examiner nor the Requester has adequately explained how adding a concave cut-out to the side of the base plate *2* opposite the catheter connector *8* would have improved a surgeon's ability to handle the access port."). It also noted that the evidence did not suggest modifying Reuter in this way would have decreased production costs as to justify an additional manufacturing step. *See* '615 Decision, 2016 WL 1166545, at *15. ("The Examiner has not provided any persuasive evidence or technical reasoning to support the finding that adding an additional cut-out . . . would have resulted in greater ease of manufacturing or reduced

cost in processing."). We find no reason to adopt a different view given the findings of the Board.

In sum, the Board's rulings upholding claims 6–7 of the '615 patent are supported by substantial evidence and are therefore *affirmed*.

III. CONCLUSION

We have considered the parties' remaining arguments and find them unpersuasive. For the reasons stated above, we *vacate* the Board's ruling that IsoMed qualifies as a printed publication and *remand* for the Board to clarify its factual findings. Additionally, we *reverse* the Board's anticipation rulings, *vacate* its obviousness rulings regarding claims 5–10 of the '302 patent, claims 1–20 of the '022 patent, and claims 8–9 of the '615 patent, and *remand* for the Board to determine whether, under a construction requiring the ports to be power injectable, these claims are obvious in view of the prior art of record, which may or may not include IsoMed. We *affirm* all other aspects of the Board's rulings.

AFFIRMED IN PART, VACATED IN PART, REVERSED IN PART, AND REMANDED IN CASE NOS. 17-1851, 17-1906, AND 17-1931.

AFFIRMED IN PART, VACATED IN PART, AND REMANDED IN CASE NOS. 17-1943 AND 17-1865.

COSTS

No costs.