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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BRUCE A. FRASER, RONALD J. DUPPERT, and WAYNE P. BEAGLE

Appeal 2018-006836
Application 13/932,540
Technology Center 3700

Before JENNIFER D. BAHR, MICHELLE R. OSINSKI, and SEAN P. O'HANLON, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–14 and 17–37. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

[1] We use the word "Appellant" to refer to the "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as BITZER Kuehlmaschinenbau GmbH. Appeal Br. 2.

THE CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter.

> 1. A refrigeration system comprising:
>
> two or more compressors configured to compress a flow of refrigerant, the flow of refrigerant having oil entrained therein;
>
> a suction flow piping arrangement configured to supply a flow of refrigerant and oil to the two or more compressors, the suction flow piping arrangement comprising:
>
> a suction header configured to carry the flow of refrigerant and oil, wherein the suction header is disposed either horizontally or at an angle between zero and five degrees from horizontal;
>
> a primary compressor supply conduit connected to, and branching off from, the suction header, the primary compressor supply conduit configured to supply refrigerant and oil to a first compressor of the two or more compressors;
>
> a secondary compressor supply conduit branching off from the suction header, the secondary compressor supply conduit configured to supply refrigerant to a second compressor of the two or more compressors;
>
> wherein the primary compressor supply conduit is configured to supply more oil to the first compressor than the secondary compressor supply conduit supplies to the second compressor.

REJECTIONS

I. Claims 1, 11–13, 19, 20, 22–26, and 28–32 stand rejected under 35 U.S.C. § 103 as unpatentable over Tanaka[2] (JP 2605498 B2,

[2] An English language translation of Tanaka was made of record on November 8, 2013, and citations to Tanaka refer to paragraph numbers from the English translation.

pub. Apr. 30, 1997) and De Bernardi (US 2005/0229627 A1, pub. Oct. 20, 2005).

II. Claims 14 and 33 stand rejected under 35 U.S.C. § 103 as unpatentable over Tanaka, De Bernardi, and Ueno (EP 1120611 A1, pub. Aug. 1, 2001).

III. Claims 1, 17, 18, and 27 stand rejected under 35 U.S.C. § 103 as unpatentable over De Bernardi and Hafkemeyer (US 2011/0081254 A1, pub. Apr. 7, 2011).

IV. Claim 30 stands rejected under 35 U.S.C. § 103 as unpatentable over De Bernardi.

V. Claims 2–7, 10, 34, and 35 stand rejected under 35 U.S.C. § 103 as unpatentable over De Bernardi and Ueno.

VI. Claims 8, 9, 21, 36, and 37 stand rejected under 35 U.S.C. § 103 as unpatentable over De Bernardi, Ueno, and Tanaka.[3]

VII. Claims 23 and 24 stand rejected under 35 U.S.C. § 103 as unpatentable over De Bernardi and Tanaka.

DISCUSSION

Rejection I

Claims 1, 11–13, 19, 20, 22–26, 28, and 29

Independent claim 1 recites, in relevant part, "a primary compressor supply conduit connected to, and branching off from, the suction header." Appeal Br. 33 (Claims App.). Appellant contests the Examiner's finding

[3] Although the Examiner omits claims 36 and 37 from the statement of the rejection (*see* Non-Final Act. 29), the Examiner addresses these claims in the detailed explanation of the rejection (*see id.* at 35).

that Tanaka discloses this feature. *See* Appeal Br. 11–12; Reply Br. 9. We agree with Appellant that a sustainable case of obviousness has not been established with respect to claims 1, 11–13, 19, 20, 22–26, 28, and 29.

In rejecting claim 1, the Examiner finds that Tanaka discloses "a primary compressor supply conduit (16) connected to, and branching off from, the suction header." Non-Final Act. 5 (boldface omitted) (citing an annotated version of Tanaka's Figure 1 on page 6 of the Non-Final Action). The Examiner explains that, "[b]ased on the broadest reasonable interpretation of the term 'branching off', . . . the primary inlet port as identified by the examiner is branching off the suction header." *Id.* The Examiner also explains that "the McGraw-Hill Dictionary of Engineering defines branch as 'in a piping system, a pipe that originates in or discharges into another pipe.'" Ans. 43. According to the Examiner, "any conduit that extends from the suction header would read on the claim. In Tanaka, the primary supply conduit extends axially in-line from the suction header, see [Tanaka] Figure 1." *Id.* at 44.

Appellant persuasively asserts that "[t]he annotated figure of Tanaka relied upon by the Examiner does not show a pipe that originates in or discharges into another pipe." Appeal Br. 12 (emphasis omitted); *see also id.* (asserting that the Examiner's annotated figure "shows the same pipe as the suction header and primary conduit"). Here, the Examiner relies on one portion of intake pipe 16 as the suction header and another portion of intake pipe 16 as the primary compressor supply conduit. *See* Non-Final Act. 5–6. In other words, the identified suction header and primary compressor supply conduit are portions of the *same* pipe (i.e., intake pipe 16), and, therefore, the identified primary compressor supply conduit does not originate in

another pipe, as set forth in the Examiner's proffered definition (*see* Ans. 43). Thus, the Examiner has not established by a preponderance of the evidence that Tanaka discloses "a primary compressor supply conduit connected to, and branching off from, the suction header," as recited in claim 1, nor has the Examiner explained why one of ordinary skill in the art might have been prompted to modify Tanaka to include such a feature.[4]

For the above reasons, we do not sustain the rejection of independent claim 1, or its dependent claims 11–13, 19, 20, 22–26, 28, and 29, under 35 U.S.C. § 103 as unpatentable over Tanaka and De Bernardi.

Claims 30–32

Independent claim 30 is distinct from independent claim 1 in that claim 30 does not require that the primary compressor supply conduit branches off from the suction header. *See* Appeal Br. 38 (Claims App.). Thus, Appellant's persuasive argument for claim 1, discussed above, is unpersuasive with respect to claim 30 because it is not commensurate with the scope ofclaim 30. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (noting that it is well established that limitations not appearing in the claims cannot be relied upon for patentability).

In rejecting claim 30, the Examiner finds that Tanaka discloses a

[4] We note the Examiner's finding that De Bernardi teaches branch tubes 9 and 10 branching off from a suction header. *See* Non-Final Act. 5 (citing De Bernardi ¶ 43); Ans. 44 (citing De Bernardi, Figs. 1, 2, ¶ 41). However, the rejection does not propose any modification of Tanaka with respect to the primary compressor supply conduit branching off from the suction header. Instead, the Examiner explains that, "for the modification of Tanaka in view of De Bernardi, the *only change* is that the suction header segment is being oriented horizontally." Non-Final Act. 7 (emphasis added).

method of distributing oil in a multiple-compressor system including, in relevant part,

> directing a flow of oil from the suction header to two or more compressors, wherein a majority of the oil is directed to a lead compressor (Figure 1; Due to the secondary compressor supply conduit 26 branching off perpendicular to the suction header and the primary compressor supply conduit 16 being the same diameter as the suction header, [and] having the primary supply conduit extending vertically downwards to act as a gravitational drain, the suction header of Tanaka would direct a majority of the oil to the lead compressor 1 . . .).

Non-Final Act. 14–15 (boldface omitted). The Examiner finds that Tanaka does not disclose, *inter alia*, "the suction header being disposed either horizontally or at an angle between zero and five degrees from horizontal." *Id.* at 16. However, the Examiner finds that De Bernardi teaches, in relevant part, a compressor assembly having "a suction header (8) disposed horizontally (Figure 1) with a primary compressor supply conduit 10 and a secondary compressor supply conduit 9." *Id.* (boldface omitted). The Examiner determines that it would have been obvious to modify Tanaka's vertical suction header so that it is oriented horizontally in order to predictably result in a more compact unit requiring less vertical clearance without modifying compressor operation, and because the modification is a mere rearrangement of parts involving only routine skill. *Id.* at 17 (citing MPEP § 2144.04(VI)(C)).

Appellant argues that the Examiner's conclusion of obviousness is in error because, "as explained in the accompanying Declaration, modifying the system of Tanaka, in the manner proposed by the Examiner, using the teachings of De Bernardi, which are directed to the horizontal suction header, would change the principle of operation of the refrigeration system

disclosed by Tanaka." Appeal Br. 7; *see also* Declaration by Bruce A. Fraser under 37 C.F.R. § 1.132, dated September 27, 2017 (hereinafter "Fraser Declaration" or "Fraser Decl."). In particular, Appellant asserts that "modifying Tanaka, which relies on a pressure differential to function as intended, by incorporating the suction header of De Bernardi[,] which is configured to guarantee equal pressure levels between the compressors, would change the principle of operation of [Tanaka]." Appeal Br. 7. According to Appellant "[t]he Declarant has laid out a persuasive argument explaining that the horizontal piping arrangement of De Bernardi is designed to guarantee equal pressure levels between the compressors, while the system of Tanaka operates on a forced pressure differential between compressors." *Id.* at 8; *see also* Fraser Decl. ¶¶ 6–9 (citing Tanaka ¶ 8; De Bernardi ¶ 26).

Appellant's argument is unpersuasive because it is not responsive to the proposed modification set forth in the rejection. As discussed above, the Examiner proposes orienting Tanaka's suction header horizontally. Non-Final Act. 17. The Examiner clarifies in the Answer that, "for the modification of Tanaka in view of De Bernardi, the only change is that the suction header segment is being oriented horizontally." Ans. 40; *see also* Non-Final Act. 7 (relying on the same proposed modification in the rejection of claim 1). In other words, although Appellant is correct that De Bernardi's suction header piping arrangement equalizes pressure between compressors (*see* De Bernardi ¶ 26), the Examiner's rejection does not propose to incorporate De Bernardi's suction header into the system of Tanaka, but, rather, simply to rotate the vertical suction header so that it is horizontal. *See* Ans. 42 (annotated versions of Tanaka's Figure 1, showing Tanaka

before and after the modification). In this regard, Appellant's argument and the Fraser Declaration appear to improperly presume a bodily incorporation of De Bernardi's suction header element into the system of Tanaka. *See* Appeal Br. 7; Fraser Decl. ¶ 9. "It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements." *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012); *see also In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (stating, "[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").

Appellant argues that the Examiner's proposed modification of Tanaka "is not taught or suggested by De Bernardi. The Examiner has proposed a modification to Tanaka not taught or suggested by any cited reference." Appeal Br. 9. This argument is unpersuasive because it appears to insist on an explicit teaching, suggestion, or motivation in the cited art to establish obviousness, but such a requirement has been foreclosed by the Supreme Court. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415, 419 (2007) (stating that a rigid insistence on teaching, suggestion, or motivation is incompatible with its precedent concerning obviousness). The Court noted that an obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for [an examiner] can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* at 418. Instead, the relevant inquiry is whether the Examiner has set forth "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), *cited with*

approval in KSR, 550 U.S. at 418. Here, as discussed above, the Examiner articulates adequate reasoning based on rational underpinnings as to why it would have been obvious to modify the suction header of Tanaka so that it is oriented horizontally. *See* Non-Final Act. 17 (explaining that the proposed modification is a mere rearrangement of parts and would predictably result in a more compact unit). In this regard, Appellant does not persuasively refute the Examiner's articulated reasoning or explain why it would lack rational underpinnings.

Appellant argues that De Bernardi does not teach that "a majority of the oil is directed to a lead compressor," as recited in claim 30. *See* Appeal Br. 8; *see also id.* at 12 (asserting that "the piping arrangement of De Bernardi fails to teach that the primary compressor supply conduit is configured to supply more oil to the first compressor than the secondary compressor supply conduit supplies to the second compressor"). This argument against De Bernardi is unpersuasive because it attacks the reference individually, rather than the rejection as articulated by the Examiner, which is based on the combined teachings of Tanaka and De Bernardi. "Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references." *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *Keller*, 642 F.2d at 425). Here, the Examiner does not rely on De Bernardi for teaching that a majority of oil is directed to the lead compressor, but, rather, as discussed above, the Examiner relies on Tanaka for teaching this feature. *See* Non-Final Act. 14–15. The Examiner also explains that Tanaka's

> supply conduits for the other compressors (26 & 36) are extending into the suction header beyond the inner surface of the suction header. This would only allow oil that was mixed with the refrigerant in the suction header from flowing into the other compressors and prevent any oil that had condensed on the inner surface of the suction header from flowing into these secondary supply conduits. All of the condensed oil would by-pass these supply conduits and flow into the primary compressor.

Id. at 15. In this regard, Appellant does not persuasively refute the Examiner's position.

Appellant argues that Tanaka's vertical suction header relies on gravity to feed more oil to the primary compressor, and rotating the suction header to be horizontal would eliminate the effect of gravity on oil flow. *See* Appeal Br. 8–9; Fraser Decl. ¶ 8. Appellant asserts that the Examiner "failed to provide any evidence that the system of Tanaka would maintain the forced pressure differential and provide more oil to the lead compressor if the vertical suction header were rotated to horizontal in the manner proposed." Appeal Br. 9. This argument is unconvincing. The Examiner explains that

> [t]he feature of having the secondary supply conduits (26 or 36) extend partially through the inner wall of the suction header would still be maintained and the primary supply conduit would still be extending vertically downward from the suction header. Both features would still result in the bulk of the oil being directed into the primary compressor for the reasons noted above.

Ans. 40. In this regard, Appellant does not persuasively refute the Examiner's position.

Moreover, even if orienting Tanaka's suction horizontally would negatively impact the effect of gravity on oil flow (*see* Appeal Br. 9; Fraser

Decl. ¶ 8), our reviewing court has recognized that a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate any or all reasons to combine teachings. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (if there are tradeoffs involved regarding features, such things do not necessarily prevent the proposed combination); *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.").

For the above reasons, Appellant does not apprise us of error in the Examiner's determination that the subject matter of claim 30 would have been obvious. Accordingly, we sustain the rejection of claim 30, and its dependent claims 31 and 32, for which Appellant does not present separate arguments (*see* Appeal Br. 6–13), under 35 U.S.C. § 103 as unpatentable over Tanaka and De Bernardi.

Rejection II

Claim 14

The rejection of claim 14, which depends indirectly from independent claim 1, relies on the same proposed combination of Tanaka and De Bernardi that we find deficient for the reasons discussed above in connection with Rejection I. *See* Non-Final Act. 18–19. The Examiner relies on Ueno for teaching additional features, but does not articulate any findings or reasoning that would remedy the aforementioned deficiency in the

combination of Tanaka and De Bernardi. *See id.* Accordingly, for the same reasons discussed above, we do not sustain the rejection of claim 14 under 35 U.S.C. § 103 as unpatentable over Tanaka, De Bernardi, and Ueno.

Claim 33

In rejecting claim 33, which depends from independent claim 30, the Examiner finds Tanaka teaches an "extension segment protruding into the suction header (Figure 2)." Non-Final Act. 19 (boldface omitted). The Examiner finds that the combination of Tanaka and De Bernardi "fail[s] to explicitly teach the extension segment protruding 25-75% of the inner diameter of the suction header." *Id.* However, the Examiner finds that Ueno teaches "wherein the extension segment protrudes into the suction header a distance equal to between 25% and 75% of an inner diameter of the suction header (Figure 5)." *Id.* (boldface omitted). The Examiner explains that

> [t]he courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device, and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, see MPEP § 2144.04 Paragraph IV.A. In Tanaka, the purpose of the extension segments is to direct the bulk of the oil to the primary compressor (Paragraph 14). A similar purpose is disclosed for the extension segments of Ueno (Paragraph 93). By having the extension segment of Tanaka extending into the suction header by a distance of 25-75% of the inner diameter of the suction header, this would prevent any oil that has collected on the inner peripheral wall from easily being sucked into the secondary compressor supply conduit, allowing the bulk of the oil to be drawn into the primary compressor.

Id. at 19–20. The Examiner determines that it would have been obvious to use the techniques of Tanaka and De Bernardi in combination with those of

Ueno to direct a bulk of the oil in the refrigerant to the primary compressor. *Id.* at 20.

Appellant argues that the Examiner's finding as to Ueno is in error because Ueno's extension segment intersects an end wall rather than an annular wall, as required by claim 33. Appeal Br. 19 (citing Ueno, Fig. 5). We are not persuaded by this argument. The Examiner clarifies in the Answer that "the base reference Tanaka teaches having the secondary & tertiary compressor supply conduits intersecting [and] extending past the annular wall of the suction header (see Figure 2)." Ans. 50. In other words, it is clear that the Examiner relies on Tanaka for teaching the extension protruding through an annular wall of the suction header, and relies on Ueno only as evidence regarding protrusion distance percentages relative to an interior dimension of a pipe.

Appellant argues that "no objective reason to combine Ueno with Tanaka and De Bernardi has been advanced" (Appeal Br. 17), and the Examiner relied on impermissible hindsight reconstruction (*id.* at 18–19). This line of argument is unconvincing because it does not specifically address the Examiner's reasoning articulated in the rejection. As discussed above, the Examiner reasons that the only difference between the prior art and claim 33 is the recitation of the relative dimensions of the extension segment and the suction header into which the extension segment protrudes. *See* Non-Final Act. 19; Ans. 50–51. We view the distance that the extension segment protrudes from the annular wall of the suction header as a design choice within the ordinary skill of the art in the absence of any evidence to support the criticality of a distance of 25%–75% of the suction header diameter. *See Gardner v. TEC Sys., Inc.*, 725 F.2d 1338 (Fed. Cir. 1984),

cert. denied, 469 U.S. 830 (holding that, where the only difference between the prior art and claims was recitation of relative dimensions of the claimed device and a device having the claimed dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from prior art device); *see also In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975) (use of claimed feature solves no stated problem and presents no unexpected result and "would be an obvious matter of design choice within the skill of the art" (citations omitted)).

Moreover, Appellant does not identify, nor do we discern, any knowledge relied upon by the Examiner that was gleaned only from Appellant's disclosure and that was not otherwise within the level of ordinary skill at the time of the invention. *See In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971) ("Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from [Appellant's] disclosure, such a reconstruction is proper."). As such, we are unpersuaded by Appellant's contention that the Examiner relied on impermissible hindsight in reaching the determination of obviousness of the claimed subject matter. *See* Appeal Br. 18–19.

For the above reasons, we sustain the rejection of claim 33 under 35 U.S.C. § 103 as unpatentable over Tanaka, De Bernardi, and Ueno.

Rejection III

Independent claim 1 recites, in relevant part, that "the primary compressor supply conduit is configured to supply more oil to the first

compressor than the secondary compressor supply conduit supplies to the second compressor." *Id.* at 33 (Claims App.). Appellant contests the Examiner's finding that De Bernardi discloses this feature. *See* Appeal Br. 20–21; Reply Br. 11–12. We agree with Appellant that a sustainable case of obviousness has not been established with respect to claim 1.

In this rejection of claim 1, the Examiner finds that "the suction header [and] supply conduits of De Bernardi can be various diameters chosen to control the velocity [and] pressure levels of the fluid flow to the compressors (Paragraph 26)." Non-Final Act. 21. The Examiner takes the position that "it would have been well within the capabilities of a person having ordinary skill in the art to configure the diameters of the suction header, the primary compressor supply conduit, and the secondary compressor supply conduit so that more oil is supplied to the first compressor." *Id.* According to the Examiner, "the primary compressor supply conduit . . . provides a more direct flow path for the refrigerant [and] oil by extending axially from the suction header, as opposed to the secondary supply conduits which branch radially from the suction header." *Id.* at 21–22; *see also* Ans. 52 (explaining that "any oil that had collected on the inner surface of the suction header would be pushed to the distal end of the suction header").

Appellant argues that the Examiner's finding that De Bernardi supplies more oil to the primary compressor is conclusory and lacks evidentiary support. *See* Appeal Br. 21; Reply Br. 11. In particular, Appellant asserts that, "[a]s explained in the accompanying Declaration, De Bernardi is designed to maintain equal pressures and to supply equal amounts of oil to all compressors." Appeal Br. 21; *see also* Fraser Decl.

¶ 11 (stating that, "[s]ince the piping arrangement of De Bernardi maintains equal pressures between compressors, oil will tend to flow to all of the compressors equally").

De Bernardi discloses that "[t]he various diameters used are chosen to maintain the minimum gas velocity and guarantee equal pressure levels between the compressors." De Bernardi ¶ 26 (boldface omitted). De Bernardi also discloses that "the outside diameter of the branch tubes is essentially equal to 1⅝ inches . . . , the outside diameter of the distribution tube being essentially equal to 2⅝ inches . . . or essentially equal to 2⅛ inches." *Id.* Given De Bernardi's disclosure that the system maintains equal pressure between compressors and the branch tubes have common dimensions, a preponderance of the evidence does not support the Examiner's finding that more oil would flow through one branch tube to a primary compressor than a branch tube to a secondary compressor. *See* Non-Final Act. 21–22.

Rejections based on 35 U.S.C. § 103(a) must rest on a factual basis. In making such a rejection, the Examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, "resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in [the] factual basis." *In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967). Absent improper hindsight reconstruction, we fail to see a sufficient reasoned explanation based on some rational underpinning as to why one of ordinary skill in the art would have been led to modify De Bernardi as proposed by the Examiner, and a reason for such modification is not otherwise evident from the record.

For the above reasons, we do not sustain the rejection of claim 1, or its dependent claims 17, 18, and 27, under 35 U.S.C. § 103 as unpatentable over De Bernardi and Hafkemeyer.

Rejection IV

Independent claim 30 recites language substantially similar to the language of claim 1 discussed above in connection with Rejection III. *See* Appeal Br. 38 (Claims App.) (reciting that "a majority of the oil is directed to a lead compressor"). In this regard, Rejection IV suffers from essentially the same deficiency as Rejection III because it is premised on an unsupported finding that De Bernardi discloses that a majority of oil is directed to a lead compressor. *See* Non-Final Act. 23–24. For the same reasons discussed above in connection with Rejection III, the Examiner has not met the burden of establishing a proper case that claim 30 is unpatentable based on De Bernardi. On this basis, we do not sustain the rejection of claim 30 under 35 U.S.C. § 103 as unpatentable over De Bernardi.

Rejections V–VII

These rejections of claims 2–10, 21, 23, 24, and 34–37, which depend directly or indirectly from independent claim 1 or independent claim 30, are deficient for the same reasons discussed above in connection with Rejections III and IV. The Examiner relies on Ueno and Tanaka for teaching additional features, but does not articulate any findings or reasoning that would cure the aforementioned deficiencies in De Bernardi. *See* Non-Final Act. 25–36. Accordingly, we do not sustain the rejections of claims 2–10, 21, 23, 24, and

34–37 under 35 U.S.C. § 103 as unpatentable over De Bernardi and one or more of Ueno and Tanaka.

DECISION

The Examiner's decision rejecting claims 1, 11–13, 19, 20, 22–26, and 28–32 under 35 U.S.C. § 103 as unpatentable over Tanaka and De Bernardi is REVERSED as to claims 1, 11–13, 19, 20, 22–26, 28, and 29, and AFFIRMED as to claims 30–32.

The Examiner's decision rejecting claims 14 and 33 under 35 U.S.C. § 103 as unpatentable over Tanaka, De Bernardi, and Ueno is REVERSED as to claim 14, and AFFIRMED as to claim 33.

The Examiner's decision rejecting claims 1, 17, 18, and 27 under 35 U.S.C. § 103 as unpatentable over De Bernardi and Hafkemeyer is REVERSED.

The Examiner's decision rejecting claim 30 under 35 U.S.C. § 103 as unpatentable over De Bernardi is REVERSED.

The Examiner's decision rejecting claims 2–7, 10, 34, and 35 under 35 U.S.C. § 103 as unpatentable over De Bernardi and Ueno is REVERSED.

The Examiner's decision rejecting claims 8, 9, 21, 36, and 37 under 35 U.S.C. § 103 as unpatentable over De Bernardi, Ueno, and Tanaka is REVERSED.

The Examiner's decision rejecting claims 23 and 24 under 35 U.S.C. § 103 as unpatentable over De Bernardi and Tanaka is REVERSED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1, 11–13, 19, 20, 22–26, and 28–32	§ 103 Tanaka and De Bernardi	30–32	1, 11–13, 19, 20, 22–26, 28, and 29
14 and 33	§ 103 Tanaka, De Bernardi, and Ueno	33	14
1, 17, 18, and 27	§ 103 De Bernardi and Hafkemeyer		1, 17, 18, and 27
30	§ 103 De Bernardi		30
2–7, 10, 34, and 35	§ 103 De Bernardi and Ueno		2–7, 10, 34, and 35
8, 9, 21, 36, and 37	§ 103 De Bernardi, Ueno, and Tanaka		8, 9, 21, 36, and 37
23 and 24	§ 103 De Bernardi and Tanaka		23 and 24
Overall Outcome		30–33	1–14, 17–29, and 34–37

AFFIRMED-IN-PART