

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RESMED LIMITED, RESMED INC., and RESMED CORP.,
Petitioners,

v.

FISHER & PAYKEL HEALTHCARE LIMITED,
Patent Owner.

Case IPR2016-01729
Patent 8,091,547 B2

Before HYUN J. JUNG, CARL M. DeFRANCO, and
MICHAEL L. WOODS, *Administrative Patent Judges*.

JUNG, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

ResMed Limited, ResMed Inc., and ResMed Corp. (“Petitioners”) filed a Petition (Paper 4, “Pet.”), requesting institution of an *inter partes* review of claims 1, 5, 6, 9, 11–14, and 22–25 of U.S. Patent No. 8,091,547 B2 (Ex. 1003, “the ’547 patent”). Fisher & Paykel Healthcare Limited (“Patent Owner”) filed a Preliminary Response (Paper 8). Upon considering the Petition and the Preliminary Response, we instituted *inter partes* review of claims 1, 5, 6, 9, 11–14, and 22–25 of the ’547 patent. Paper 9 (“Dec. on Inst.”).

After institution, Patent Owner filed a Response (Paper 12, “PO Resp.”) and filed a statutory disclaimer of claims 24 and 25 (Paper 23; Ex. 2007). Petitioners filed a Reply (Paper 15, “Pet. Reply”). Petitioners proffered a Declaration of Alexander Virr (Ex. 1012, “Virr Declaration” or “Virr Decl.”) with their Petition and a Second Declaration of Alexander Virr (Ex. 1028, “Second Virr Declaration”) with their Reply. Patent Owner proffered a Declaration of Hartmut Schneider, M.D., Ph.D. (Ex. 2004, “Schneider Decl.”) with its Response. A deposition transcript for Dr. Schneider (Ex. 1029) was filed.

An oral hearing in this proceeding and Cases IPR2016-01716, IPR2016-01717, IPR2016-01719, IPR2016-01725, IPR2016-01727, IPR2016-01730, and IPR2016-01731 was held on December 6, 2017; a transcript of the hearing is included in the record (Paper 28, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioners have shown by a

preponderance of the evidence that claims 1, 6, 9, 11–14, 22, and 23, but not claim 5, of the '547 patent are unpatentable.

A. Grounds of Unpatentability at Issue

We instituted *inter partes* review on the grounds that, under 35 U.S.C. § 103:

claims 1, 11–14, 24, and 25 are unpatentable over Netzer¹ and Levine²,

claim 5 is unpatentable over Netzer, Levine, and Bahr³, and
claims 6, 9, 22, and 23 are unpatentable over Netzer, Levine, and Dickinson⁴. Dec. on Inst. 17, 22, 27, 28.

B. Related Proceedings

The parties indicate that the '547 patent is at issue in *Fisher & Paykel Healthcare Ltd. v. ResMed Corp.*, 3:16-cv-02068-GPC-WVG (S.D. Cal.). Pet. 2; Paper 6, 1–2; Ex. 1023; Ex. 3001 (order granting motion to stay pending resolution of *inter partes* review).

The parties also indicate that the '547 patent was the subject of two cases that were dismissed without prejudice: *ResMed Inc. v. Fisher & Paykel Healthcare Corp. Ltd.*, 3:16-cv-02072-JAH-MDD (S.D. Cal.) and *Fisher & Paykel Healthcare Ltd. v. ResMed Corp.*, 3:16-cv-06099-R-AJW (C.D. Cal.). Pet. 2; Paper 6, 1; Exs. 1025–1027.

¹ WO 98/04311, published Feb. 5, 1998 (Ex. 1007). Exhibit 1008 is a certified English translation of Netzer, and citations to Netzer in this Decision are to Exhibit 1008.

² US 5,943,473, issued Aug. 24, 1999 (Ex. 1009).

³ US 2001/0017134 A1, published Aug. 30, 2001 (Ex. 1011).

⁴ US 6,398,197 B1, issued June 4, 2002 (Ex. 1016).

The '547 patent is also the subject of Cases IPR2016-01730 and IPR2016-01731. Pet. 3. The '547 patent issued from a division of an application, that became U.S. Patent No. 7,111,624 (Ex. 1001), which is at issue in Cases IPR2016-01725 and IPR2016-01727. Ex. 1003 (60); Pet. 3. Another related patent is at issue in Cases IPR2016-01716 and IPR2016-01717. Pet. 3.

C. The '547 Patent (Ex. 1003)

The '547 patent issued January 10, 2012, from an application filed July 5, 2006, and is a division of an application filed September 18, 2002, which is a continuation-in-part of an application filed on March 14, 2001. Ex. 1003, (22), (45), (60), 1:7–12; Pet. 11, 13. The '547 patent also claims priority to a New Zealand application filed on March 21, 2000. Ex. 1003, (30); Pet. 11, 13.

The '547 patent relates to “a humidifier arrangement for use in stand alone humidifiers.” Ex. 1003, 1:18–24. The '547 patent states that humidifier chambers are “now used in compact and portable ventilation machines, for example machines intended for the home treatment of obstructive sleep apnea (CPAP machines).” *Id.* at 1:34–37. Figure 1 of the '547 patent is reproduced below:

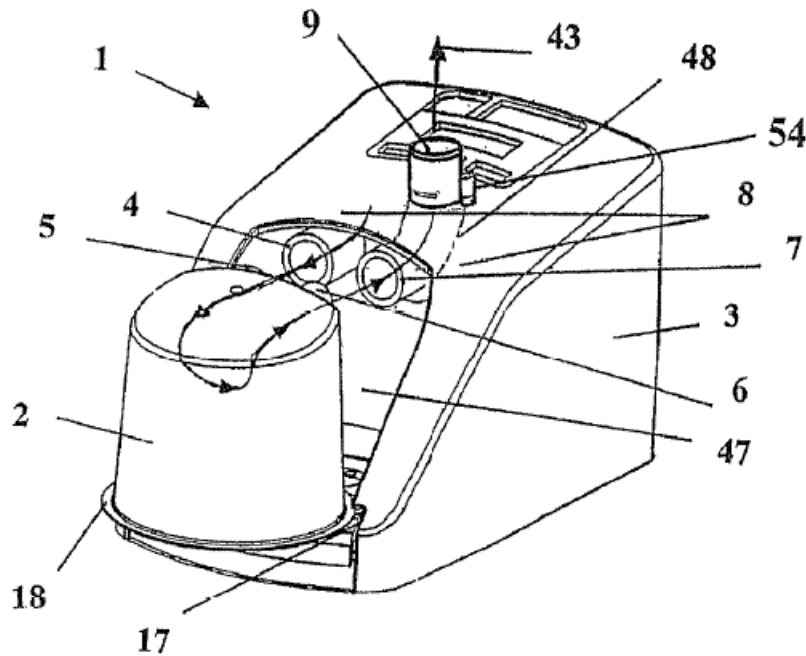


Figure 1

Figure 1 is a perspective view of a water chamber and CPAP machine. *Id.* at 3:36–37. CPAP machine 1 has water chamber 2 that includes gases inlet port 5 and gases outlet port 6. *Id.* at 3:36–41, 4:17–20. CPAP machine 1 also includes chamber receiving bay 47 that receives water chamber 2, connection manifold 8 that connects with gases inlet port 5 and gases outlet port 6, and a heater base in bay 47 that heats water in chamber 2. *Id.* at 4:23–26, 4:29–30. Connection manifold 8 has a passage which receives airflow from a blower and directs it into water chamber 2 and a passage that directs airflow from gases outlet port 6 to CPAP patient outlet port 9. Ex. 1003, 4:57–61. CPAP machine 1 also has slot 17 that co-operates with flange 18 at the base of water chamber 2 and securing latch 19 (shown in Figure 2) that prevents removal of water chamber 2 when engaged with CPAP machine 1. *Id.* at 4:29–37.

In use, air from the blower exits through manifold outlet port 4, enters water chamber 2 through gases inlet port 5, is humidified by water

evaporating in water chamber 2, leaves water chamber 2 through gases outlet port 6, enters manifold inlet port 7, and is directed to outlet port 9. *Id.* at 5:1–10.

An advantage obtained from the breathing conduit connection 9 being located on the body of the CPAP machine and not connected to the top of the water chamber directly, is that complete connection or disconnection of the water chamber from the CPAP system can be achieved with a single slide-on or slide-off motion.

Id. at 5:10–15.

D. Illustrative Claim

The '547 patent has 25 claims, of which Petitioners challenge claims 1, 5, 6, 9, 11–14, and 22–25. Patent Owner filed a statutory disclaimer for claims 24 and 25. Paper 23, Ex. 2007. Of the remaining challenged claims, claims 1 and 6 are independent, and claim 1 is reproduced below:

1. An apparatus for use in humidified gases delivery treatment comprising:
 - a housing,
 - a removable humidification chamber with a base,
 - a gases line inlet in said housing to receive pressurised gases from a pressurised gases source, said gases line inlet adapted to make a separable fluid connection with a breathing conduit,
 - a gases outlet in said housing in fluid connection with said gases line inlet, adapted to make a separable fluid connection with an inlet of said humidification chamber in order to provide gases flow into said humidification chamber,
 - a humidified gases return in said housing, adapted to make a separable fluid connection with an outlet of said humidification chamber in order to receive humidified gases from said humidification chamber,
 - a gases line outlet in said housing, in fluid connection with said humidified gases return, adapted to make fluid connection

with or in fluid connection with a breathing conduit for delivery of humidified gases to a patient,

a chamber heater in said housing for vaporising liquid water in said humidification chamber in order to provide water vapour to gases flow passing through said humidification chamber,

said housing adapted to accommodate a humidification chamber, said humidification chamber being removable and engagable with said housing via a single motion, said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater, said single motion also making or breaking said separable connections between said gases outlet and said humidification chamber inlet, and said humidified gases return and said humidification chamber outlet.

Ex. 1003, 9:48–10:14.

II. CLAIM INTERPRETATION

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).

For the Decision on Institution, we determined that express interpretation of any claim term was not necessary. Dec. on Inst. 9.

Petitioners state that “[c]laim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure.” Pet. 16 (citing *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007)). Petitioners also state that “[c]onstrutions offered in the Petition are intended to aid this proceeding.”

Id. In the Decision on Institution, we found no explicit constructions offered in the Petition. Dec. on Inst. 9.

Patent Owner proposes interpretations for “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater,” of claim 1, and “auxiliary electrical connection plug or socket,” of claim 5. PO Resp. 20–30.

After reviewing the complete record, we address below Patent Owner’s proposed interpretation for “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater,” but we do not need to interpret “auxiliary electrical connection plug or socket” to determine whether Petitioners have shown the unpatentability of the claims by a preponderance of the evidence. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (construing only those terms in controversy and only to the extent necessary to resolve the controversy).

A. “*said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater*” (claim 1)

Patent Owner proposes an interpretation for “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater,” of claim 1. PO Resp. 20–26. Patent Owner contends that the phrase “requires more than the ‘single motion of engagement’ simply bringing the base of the water heater adjacent with the chamber heater” and “means ‘a single motion of engagement that moves the chamber base in a direction so as to both move the chamber base adjacent the chamber heater and also press the chamber base against the chamber heater.’” *Id.* at 20–21. In support of its interpretation, Patent Owner cites to

the specification (*id.* at 21 (citing Ex. 1003, 7:63–66), 22–24 (citing Ex. 1003, 4:32–37, 4:45–56, Figs. 1, 2)), claims 6 and 24 (*id.* at 24), its declarant testimony (*id.* at 21–22 (citing Schneider Decl. ¶¶ 36, 37)), and prosecution history (*id.* at 25–26 (citing Ex. 1006, 43, 58–60, 89)). Petitioners reply to Patent Owner’s proposed interpretation. Pet. Reply 2–7 (citing PO Resp. 20–25; Ex. 1003, 7:63–8:2; 2d Virr Decl. ¶¶ 7–13; Ex. 1035, 54:11–25, 56:22–57:19, 58:24–59:1, 60:25–63:16, 68:7–20, 69:6–17, 72:13–73:7).

We first turn to the claims themselves. Claim 1 does not require expressly that the single motion moves the chamber base so as to press the chamber base against the chamber heater, as proposed by Patent Owner. Claim 1 recites, in relevant part, “urging the base of said humidification chamber adjacent and in contact with said chamber heater” Ex. 1003, 10:8–10.

Claim 6 recites “wherein said single motion disposes said heat conductive base adjacent a heater,” and claim 24 recites “wherein said single motion of engagement disposes the base of said humidification chamber adjacent said heater,” whereas claim 1 recites “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater.” Ex. 1003, 10:8–10, 11:1–3, 12:47–49. Taken together, these claims indicate that “urging the base” results in a base being “adjacent and in contact” with a heater but “disposes the base” results in a base being “adjacent” a heater.

Turning next to the specification, the portions cited by Patent Owner describe the urging of securing latch 19 into a release position or a locking position (Ex. 1003, 4:32–37, 4:45–56) and another configuration “where the slide-on direction employed to fit the water chamber is not horizontal but at

an angle from the horizontal or vertical” (*id.* at 7:63–66). These cited portions do not indicate how urging a base differs from disposing a base. These cited portions also do not rebut the presumption that the phrase carries its ordinary and customary meaning and do not provide a definition of the phrase with reasonable clarity, deliberateness, and precision. *See* Ex. 1003, 4:32–37, 4:45–56, 7:63–66; *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007); *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

The specification also describes, “[o]nce the water chamber is properly seated on the heater base . . . the flange 18 and base of the chamber will no longer be in contact with the securing latch 19.” *Id.* at 4:50–54. Because the latch does not contact the base of the seated water chamber, we are not persuaded that the latch “presses” against the chamber. Thus, we do not find the specification’s description of latch 19 as shedding any light on the meaning of “urges” in the context of claim 1. Moreover, the specification describes a single slide on or slide off motion in relation to connecting ports of a water chamber (Ex. 1003, Abstract, 1:37–41, 3:1–4, 3:22–23) or installing a water chamber (*id.* at 2:48–51, 4:45–48, 5:13–15, 5:66–6:4, 6:54–56). In different aspects, the single motion can “urg[e] said heat conductive base adjacent and in said contact with a heater” (*id.* at 3:5–6) or “make operable engagement with a heater base” (*id.* at 3:20–21). Based on the above discussion of the specification, we, thus, find that the specification indicates that “urging” is related to being adjacent and in contact or making an operable engagement. We do not find, however, that the specification further indicates that “urging” the base is related to pressing the base against a heater, as proposed by Patent Owner.

Patent Owner also cites to paragraphs 36 and 37 of its Schneider Declaration (Ex. 2004). The cited paragraphs provide testimony as to how the angled slide-on direction can be beneficial. Schneider Decl. ¶¶ 36, 37. The testimony, however, does not explain how “urging” as used in Patent Owner’s cited portions of the specification (Ex. 1003, 4:32–37, 4:45–56, 7:63–66) would be understood by one of ordinary skill in the art to have the interpretation proposed by Patent Owner for “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater.”

Turning next to the prosecution history, portions cited by Patent Owner indicate an amendment was made to the claim that issued as claim 1. *See* Ex. 1006, 43, 58–60, 89. However, the cited portions of the prosecution history do not indicate that the phrase “single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater” means “a single motion of engagement that moves the chamber base in a direction so as to both move the chamber base adjacent the chamber heater and also press the chamber base against the chamber heater,” as proposed by Patent Owner.

Thus, for the preceding reasons, the full record does not persuade us to adopt Patent Owner’s proposed interpretation of “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater.” In particular, we determine that record evidence does not support the phrase requiring a single motion of engagement that presses the chamber base against the chamber heater, as urged by Patent Owner. As discussed below, any further express

interpretation of the phrase is not necessary for determining whether Petitioners have shown unpatentability by a preponderance of the evidence.

III. OBVIOUSNESS CHALLENGES

Petitioners contend that:

(1) claims 1, 11–14, 24, and 25 are unpatentable over Netzer (Ex. 1008) and Levine (Ex. 1009) (Pet. 4, 16–43);

(2) claim 5 is unpatentable over Netzer, Levine, and Bahr (Ex. 1011) (Pet. 4, 43–49); and

(3) claims 6, 9, 22, and 23 are unpatentable over Netzer, Levine, and Dickinson (Ex. 1016) (Pet. 5, 50–60). In support of these contentions, Petitioners cite to the asserted references and the Virr Declaration (Ex. 1012) and provide claim charts. *See* Pet. 16–60.

Patent Owner disputes the alleged obviousness of claims 1, 5, 6, 9, 11–14, 22, and 23 with citations to the asserted references and the Schneider Declaration (Ex. 2004). PO Resp. 31–57. Patent Owner also filed a disclaimer for claims 24 and 25. Paper 23; Ex. 2007.

To prevail in their challenges under 35 U.S.C. § 103, Petitioners must prove unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and

content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1996).

As discussed below, for claims 1, 5, and 11–14, the parties’ disputes are related to the scope and content of the prior art and differences between these claims and the prior art. For claims 6, 9, 22, and 23, the parties’ disputes are related to the reason for combining the asserted references. The parties do not dispute the level of ordinary skill in the art and do not direct us to any objective evidence of nonobviousness.

After reviewing the complete record, we conclude that Petitioners have shown by a preponderance of the evidence that Netzer and Levine teach or suggest each limitation of claims 1 and 11–14, that Netzer, Levine, and Dickinson teach or suggest each limitation of claims 6, 9, 22, and 23, that a person of ordinary skill in the art would have had a reason to combine the teachings of the asserted references, and that a person of ordinary skill in the art would have had a reasonable expectation of success in combining those teachings.

A. Level of Ordinary Skill

Petitioners provide a level of ordinary skill in the art. Pet. 15 (citing Virr Decl. ¶¶ 22–23). Patent Owner also provides a level of ordinary skill in the art. PO Resp. 18–19 (citing Schneider Decl. ¶ 30). Patent Owner also states that “[w]hile the level of skill in the art proposed by [Patent Owner] differs from that proposed by Petitioners, [Patent Owner] believes the difference is immaterial to deciding the issues raised by the Petition.” *Id.* at 19.

We adopt Petitioners’ asserted level of ordinary skill and find that a person of ordinary skill in the art (“POSITA”) as of any of the claimed priority dates as early as March 2000 would have had a bachelor’s degree in mechanical engineering, biomedical engineering, or a related discipline, and at least five years of relevant product design experience in the field of medical devices or respiratory therapy, or an equivalent advanced education.

Pet. 15 (citing Virr Decl. ¶¶ 22–23). We also agree with Patent Owner that any differences in the parties’ proposed level of ordinary skill does not impact our analysis. *See* PO Resp. 19.

B. Claims 1, 11–14, 24, and 25

1. Netzer (Ex. 1008)

Netzer relates to a “gas supply device for sleep apnea having a respiratory gas source . . . wherein the flow guiding element is connected to a gas humidifier. . . .” Ex. 1008, 1⁵. Figure 1 of Netzer is reproduced below.

⁵ Petitioners cite to the exhibit page number at the lowermost center of each page. References to Netzer in this Decision also cite to the exhibit page number.

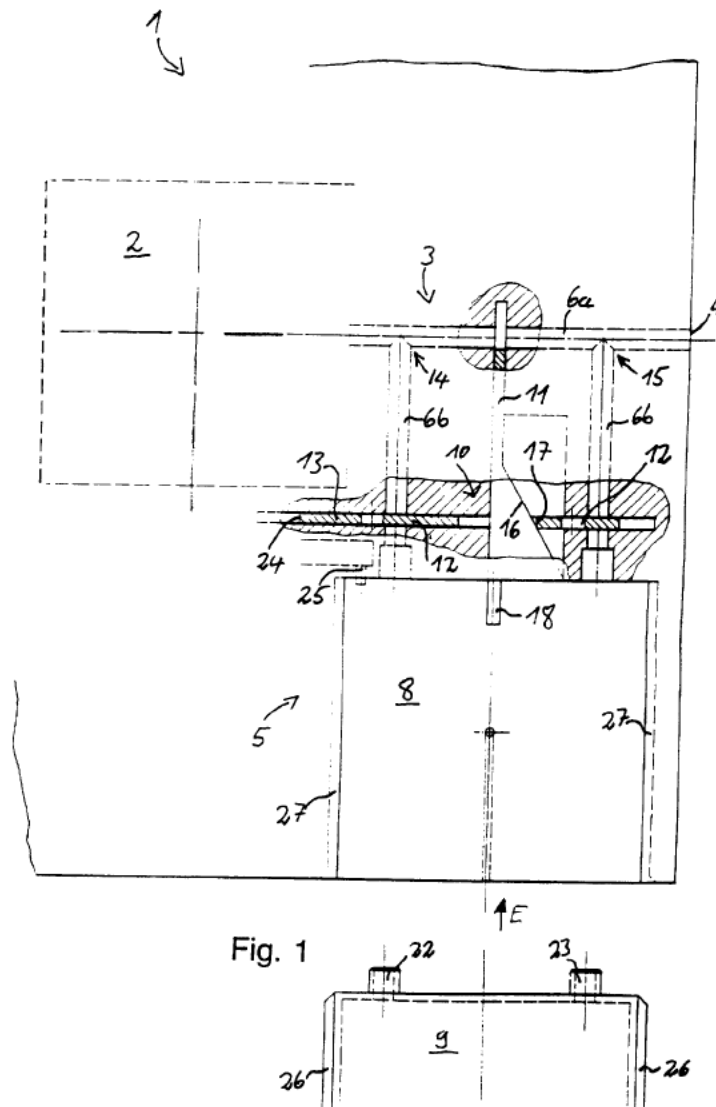


Figure 1 is a top view of gas supply device 1 with a liquid container removed from a device housing. Ex. 1008, 6. Gas supply device 1 has “respiratory gas source 2, which leads to a respiratory gas outlet 4 via a flow guiding element 3,” and humidifier housing 8, which receives liquid container 9. *Id.* at 6, 7. Respiratory gas source 2 “supplies the pressurized gas contained therein to the flow guiding element 3 via a valve.” *Id.* at 6. An air hose (not shown) “can be connected to the respiratory gas outlet 4, connecting the device 1 to a . . . face mask.” *Id.* at 7.

Flow guiding element 3 has two flow paths 6a, 6b. Ex. 1008, 7. “[F]irst flow path 6a leads to the respiratory gas outlet 4, bypassing the gas humidifier 5,” and “second flow path 6b leads to the respiratory gas outlet 4 via an admixing point 7 . . . connected to the gas humidifier 5.” *Id.* “[F]irst flow path 6a is opened or closed by . . . main flow blocking valve 11,” and “second flow path 6b . . . is opened or closed by . . . bypass flow blocking valves 12.” *Id.*

Liquid container 9 can be removed from and replaced in humidifier housing 8. *Id.* Liquid container 9 has container inlet 22 and container outlet 23 that “are each disposed at a spacing above the maximum liquid level.” *Id.* at 8. “Lateral guide profiles 26 are provided on the liquid container 9, which engage in corresponding guide grooves 27 in the humidifier housing 8,” and thus, “insertion of the liquid container 9 in the humidifier housing 8 is facilitated, and the positioning of the liquid container 9 within the humidifier housing 8 is improved.” *Id.* at 9.

When inserting liquid container 9, first flow path 6a to gas outlet 4 is closed, and second flow path 6b to liquid container 9 is opened. *Id.* at 8. Thus, “respiratory gas can only be supplied . . . by means of one of the flow paths, and the respective flow path is determined by the insertion or removal of the liquid container.” *Id.* at 4.

“The gas humidifier 5 has a heating unit, not shown in greater detail, disposed in the region of the liquid container 9 for generating steam.” *Id.* at 9. The heating unit “is electrically connected to a spring-loaded electrical switch 25” that is “acted on by the liquid container 9 when it is placed in its usage position in the humidifier housing 8, and is then located in its actuation position.” *Id.* “[W]hen the liquid container 9 is removed from the

humidifier housing 8, the spring-loaded switch 25 is flipped, and the heating unit is thus shut off,” so that the heating unit “functions only when the liquid container 9 is inserted. . . .” *Id.*

2. Levine (*Ex. 1009*)

Levine relates to “humidifier devices employing disposable humidifier cartridges” *Ex. 1009*, 1:5–9. Figure 1 of Levine is reproduced below.

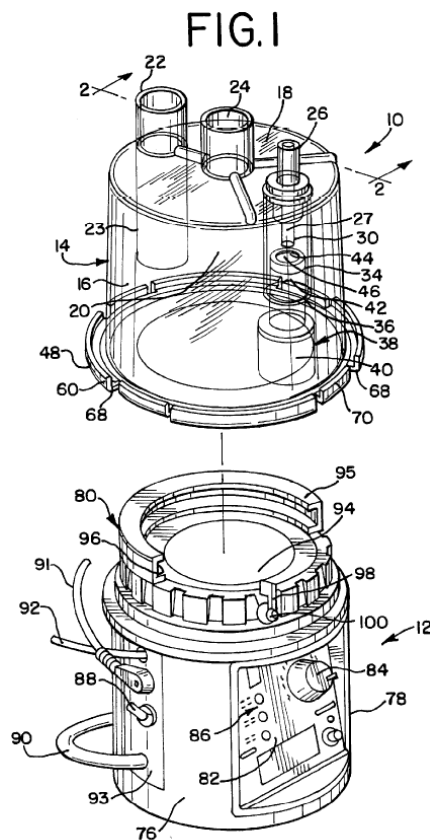


Figure 1 is a partially exploded, perspective view of a heated cartridge humidifier and heat source with some parts omitted for clarity. *Id.* at 2:33–35. Heated cartridge humidifier 10 is configured to be engaged operationally with heating unit 12. *Id.* at 2:48–51. Humidifier 10 includes housing 14 with upper end 18, and upper end 18 includes gas inlet 22, gas delivery outlet 24, and water inlet port 26. *Id.* at 2:51–59, 2:61–65. Gas

inlet 22 and gas delivery outlet 24 “are adapted to be connected to a conventional breathable gas delivery system of the type used for respiratory patients.” Ex. 1009, 2:59–61. Housing 14 is on base plate 48, which includes central conductive portion 50. *Id.* at 3:30–32, Figs. 2, 3.

Heating unit 12 provides heat to water delivered through water inlet port 26 so that the water is vaporized. *Id.* at 4:11–14. The engagement of bracket 95 of heating unit 12 and lip 70 of humidifier 10 maintain humidifier 10 in operational alignment upon heating surface 94 so that heating surface 90 conductively heats conductive portion 50. *Id.* at 4:24–38.

3. Analysis

a. Uncontested Limitations

Petitioners persuade us that Netzer teaches or suggests all the limitations of claims 1 and 11–14. Pet. 16 (citing Ex. 1008 at 10; Virr Decl. ¶¶ 49–57), 26–43 (claim chart). In particular, we find that Netzer teaches an “apparatus for use in humidified gases delivery treatment” with “a housing” and “a removable humidification chamber with a base.” Ex. 1008, 5 (“depending on if the liquid container has been placed in or removed from the humidifier housing and/or the device housing”), 7 (“A gas supply device for sleep apnea, indicated as a whole with the numeral 1”), 8 (“gas supply device 1 for sleep apnea . . . has . . . a humidifier housing 8, for receiving a liquid container 9”), Figs. 1–3; *see also* Pet. 26–27 (citing Ex. 1008, 5, 7–9, Figs. 1–3; Virr Decl. ¶¶ 49–57).

We also find that Netzer teaches “a gases line inlet in said housing to receive pressurised gases from a pressurised gases source, said gases line inlet adapted to make a separable fluid connection with a breathing conduit.” Ex. 1008, 7 (“respiratory gas source 2, which leads to a respiratory gas outlet

4 via a flow guiding element 3” and “respiratory gas source . . . supplies the pressurized gas contained therein to the flow guiding element 3 via a valve”), 8, Fig. 1; *see also* Pet. 27 (citing Ex. 1008, 7, 8, Fig. 1; Virr Decl. ¶¶ 49–57).

We further find that Netzer teaches “a gases outlet in said housing in fluid connection with said gases line inlet, adapted to make a separable fluid connection with an inlet of said humidification chamber in order to provide gases flow into said humidification chamber.” Ex. 1008, 8 (“flow guiding element 3 . . . has two flow paths 6a, 6b” and “second flow path 6b leads to the respiratory gas outlet 4 via . . . gas humidifier 5”), 9, Figs. 1 (showing flow guiding element 3 includes second flow path 6b), 2 (showing second flow path 6b connected to container inlet 22); *see also* Pet. 27–28 (citing Ex. 1008, 8, 9, Figs. 1, 2, 4; Virr Decl. ¶¶ 49–57).

We additionally find that Netzer teaches “a humidified gases return in said housing, adapted to make a separable fluid connection with an outlet of said humidification chamber in order to receive humidified gases from said humidification chamber.” Ex. 1008, 8 (“second flow path 6b leads to the respiratory gas outlet 4 via . . . gas humidifier 5”), Fig. 2 (showing container outlet 23 connected to second flow path 6b)); *see also* Pet. 28–29 (citing Ex. 1008, 8, 9, Figs. 1, 2, 4; Virr Decl. ¶¶ 49–57).

We furthermore find that Netzer teaches “a gases line outlet in said housing, in fluid connection with said humidified gases return, adapted to make fluid connection with or in fluid connection with a breathing conduit for delivery of humidified gases to a patient.” Ex. 1008, 8 (“air hose . . . can be connected to the respiratory gas outlet 4” and “flow guiding element 3 . . . leads to the respiratory gas outlet 4”), Fig. 2 (showing second flow path 6b

connected to respiratory gas outlet 4); *see also* Pet. 29–30 (citing Ex. 1008, 7, 8; Virr Decl. ¶¶ 49–57).

We also find that Netzer teaches “a chamber heater in said housing for vaporising liquid water in said humidification chamber in order to provide water vapour to gases flow passing through said humidification chamber” and “said housing adapted to accommodate a humidification chamber.” Ex. 1008, 10 (“The gas humidifier 5 has a heating unit . . . disposed in the region of the liquid container 9” and “functions only when the liquid container 9 is inserted”); *see also* Pet. 30–31 (citing Ex. 1008, 8, 10, Figs. 1, 2; Virr Decl. ¶¶ 49–57).

We moreover find that Netzer teaches “said humidification chamber being removable and engagable with said housing via a single motion” and “said single motion also making or breaking said separable connections between said gases outlet and said humidification chamber inlet, and said humidified gases return and said humidification chamber outlet.” Ex. 1008, 5 (“the respiratory gas can only be supplied . . . by means of one of the flow paths, and the respective flow path is determined by the insertion or removal of the liquid container”), 8 (“liquid container 9 can be removed from and replaced in the humidifier housing”), Figs. 1 (showing container inlet 22 and outlet 23), 2 (showing container inlet 22 and outlet 23 connected to second flow path 6b); *see also* Pet. 31 (citing Ex. 1008, 8, 10, Figs. 1, 2), 33–34 (citing Ex. 1008, 5, 8, 9, Figs. 1, 2; Virr Decl. ¶¶ 49–57).

Patent Owner presents no specific arguments regarding the limitations discussed above. *See* PO Resp. 31–37; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied by be considered admitted.”); Paper 11,

3 (“The patent owner is cautioned that any arguments for patentability not raised and fully briefed in the response will be deemed waived.”).

b. *“said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater”*

Petitioners persuade us that Netzer and Levine each teaches “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater.” Pet. 16–17 (citing Ex. 1009, 4:34–38; Virr Decl. ¶¶ 65–66, 94–96), 24 (citing Ex. 1009, 4:31–37), 31–33 (citing Ex. 1008, 10; Ex. 1009, 4:34–38, Fig. 1; Virr Decl. ¶¶ 49–57, 69, 70, 94–96). In particular, we find that Netzer teaches “gas humidifier 5 has a heating unit . . . disposed in the region of the liquid container 9” that “functions only when the liquid container 9 is inserted.” Ex. 1008, 10; Virr Decl. ¶¶ 52–54, 56. We also find that Levine teaches “humidifier 10 in operational alignment upon the heating surface 94” and thus, “conductive portion 50 will be conductively heated by the heating surface 94.” Ex. 1009, 4:34–38, Fig. 1; Virr Decl. ¶ 70.

Patent Owner responds that Netzer and Levine do not teach or suggest a “single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater,” when interpreted as proposed by Patent Owner. PO Resp. 32. Patent Owner contends that Netzer and Levine do not teach or suggest “urging . . . in contact.” *Id.* (citing Pet. 31–32). Patent Owner argues that Petitioners cite a portion of Netzer that teaches a “heating unit ‘in the region of liquid container 9’ that is automatically switched on when the liquid container is placed in the humidifier housing” but does not teach or suggest that “inserting the water chamber urges the water chamber into contact with a heater.” *Id.* at 32–33

(citing Ex. 1008, 10; Schneider Decl. ¶ 82). Patent Owner also argues that Netzer’s water chamber slides horizontally and is not inserted at an angle so that the water chamber presses against the heater plate. *Id.* at 33–35 (citing Ex. 1008, 10, Figs. 1, 3; Schneider Decl. ¶ 83). As for Levine, Patent Owner argues that “lip 60 of the water chamber is inserted into the channel 96 and the water chamber slides over the heating surface 94” and thus, the base of the water chamber moves in a direction parallel to the heating surface and is not urged into the heater plate, as required by the claim. *Id.* at 36–37 (citing Ex. 1009, 4:23–37, Fig. 1; Schneider Decl. ¶ 85).

For the reasons discussed above in Section II.A, the full record does not persuade us that the broadest reasonable interpretation in view of the specification of the ’547 patent of “said single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater” requires pressing the chamber base against the chamber. Therefore, we determine that a preponderance of the evidence shows that Netzer and Levine teach this recitation of claim 1 and thus, for the reasons here and in Section III.B.3.a, we determine that Petitioners have shown by a preponderance of the evidence that Netzer and Levine teach the limitations of claim 1.

c. Reason for Combining

Petitioners contend that a person of ordinary skill in the art would have combined Netzer and Levine “to implement the well-known and conventional means of applying heat to the base of a water container” and would have understood that Netzer’s heating unit would have been disposed beneath its liquid container 9 “in order to conduct heat from the heating unit, through a base of the container 9, and to the water.” Pet. 22–23 (citing Virr

Decl. ¶¶ 94–96); *see also id.* at 24 (citing Ex. 1003, 1:26–29). Petitioners also contend that placing Netzer’s heating unit in the base of humidifier housing 8 “is simply the logical place where the heating unit would be disposed in the region of liquid container 9.” *Id.* at 23. According to Petitioners:

A person of ordinary skill in the art would have understood that disposing the heating unit elsewhere (e.g., on the ceiling of the humidifier housing 8 or on one of the sidewalls) would not efficiently vaporize water in the container 9, and/or could interfere with other structures in the humidifier 5 such as guide grooves 27 or switch 25.

Pet. 23–24 (citing Ex. 1008, Fig. 1; Virr Decl. ¶ 95).

Petitioners further contend that a person of ordinary skill “would have been motivated to incorporate *Levine*’s heating surface 94 into *Netzer*’s humidifier 5 beneath the liquid container 9 in order to efficiently heat water in the liquid container 9” and “to ensure efficient heat conduction and minimize the heater’s energy consumption.” *Id.* at 24–25 (citing Ex. 1008 at 2; Virr Decl. ¶ 96). Petitioners further assert that similar guide structures are in Netzer and Levine, and that Netzer’s silence on its heating feature would have prompted a person of ordinary skill “to select an appropriate heating mechanism from the prior art and *Levine* describes an appropriate heating mechanism.” *Id.* at 25–26 (citing Ex. 1009, 4:30–38).

The full record supports Petitioners’ position that one of ordinary skill in the art would have combined Netzer and Levine to implement the “well-known and conventional means of applying heat to the base of a water container,” as taught by Netzer and Levine based on the findings discussed above. Pet. 22–23. The full record also supports that modifying Netzer in

view of Levine to heat more efficiently the water in liquid container 9 of Netzer. We credit the testimony of Mr. Virr regarding these contentions. Virr Decl. ¶¶ 95, 96. We, therefore, determine that one of ordinary skill in the art would have had a reason to combine the teachings of Netzer and Levine.

We also credit Mr. Virr's testimony that the proposed combination of Netzer and Levine would be "implement[ing] the well-known and conventional means of applying heat to the base of a water container." Virr Decl. ¶ 94. Thus, we determine that one of ordinary skill in the art would have had a reasonable expectation of success in combining the teachings of Netzer and Levine.

Patent Owner presents no specific arguments regarding Petitioners' reason for combining the Netzer and Levine. *See* PO Resp. 31–37; *see also* Paper 10, 3 ("The patent owner is cautioned that any arguments for patentability not raised and fully briefed in the response will be deemed waived."). Thus, in view of the record developed after trial, we are persuaded by a preponderance of the evidence that claim 1 is unpatentable over Netzer and Levine

d. Dependent Claims 11–14

Claim 11 depends from claim 1 and recites "wherein said housing includes a connection manifold." Ex. 1003, 11:25–27. Petitioners persuade us that Netzer teaches its limitations. Pet. 34–35 (citing Ex. 1008, 7, Fig. 1; Virr Decl. ¶¶ 49–57, 69, 70). In particular, we find that Netzer teaches "a respiratory gas source 2 . . . leads to a respiratory gas outlet 4 via a flow guiding element 3." Ex. 1008, 7, Fig. 1.

Claim 12 depends from claim 11. Ex. 1003, 11:27–45. Petitioners persuade us that Netzer teaches its limitations. Pet. 35–38 (citing Ex. 1008, 7–13, Figs. 1, 2, 4; Virr Decl. ¶¶ 49–57, 69, 70). Specifically, we find that Netzer teaches a “connection manifold comprising: said gases line inlet adapted to make a fluid connection with a breathing conduit in order to receive pressurised gases,” as recited by claim 12. Ex. 1008, 7 (“a respiratory gas source 2 . . . leads to a respiratory gas outlet 4 via a flow guiding element 3”), 8, Fig. 1.

We also find that connections to Netzer’s flow guiding element 3 that mates with inlet 22 and outlet 23 of liquid container 9, respectively, teach a “connection manifold comprising . . . said gases outlet adapted to make a separable fluid connection with an inlet of a humidification chamber in order to provide gases into said humidification chamber” and “said humidified gases return adapted to make a separable fluid connection with an outlet of said humidification chamber in order to receive humidified gases from said humidification chamber,” as recited by claim 12. *Id.* at 9, Figs. 1, 2, 4.

We further find that Netzer’s respiratory gas outlet 4 teaches a “connection manifold comprising . . . said gases line outlet in fluid connection with said gases return” and “adapted to make a fluid connection with a breathing conduit for delivery of humidified gases to a patient,” as recited by claim 12. *Id.* at 7–9, Figs. 1, 2, 4. We additionally find that removal and replacement of Netzer’s liquid container 9 teaches “said separable connections being made or broken by a single motion of said humidifier chamber being placed adjacent to said manifold” (*id.* at 8, 10–13, Figs. 1, 2).

Claim 13 depends from claim 12 and recites “wherein said manifold includes a passage between said gases line inlet and said gases outlet.” Ex. 1003, 11:46–49. Petitioners persuade us that Netzer teaches its limitations. Pet. 38–39 (citing Ex. 1008, 9, Figs. 1, 2, 4; Virr Decl. ¶¶ 49–57). In particular, we find that Netzer teaches bypass inlet 14 and path 6b between a breathing conduit and a connection for inlet 22 of liquid container 9.

Claim 14 depends from claim 12 and recites “wherein said manifold includes a passage between said humidified gases return and said gases line inlet.” Ex. 1001, 11:50–53. Petitioners persuade us that Netzer teaches its limitations. Pet. 39–40 (citing Ex. 1008, 9, Figs. 1, 2; Virr Decl. ¶¶ 49–57). Specifically, we find that Netzer teaches bypass inlet 15 and path 6b between a connection for outlet 23 of liquid container 9 and respiratory gas outlet 14. Ex. 1008, 9, Figs. 1, 2.

Patent Owner relies on its arguments for claim 1. *See* PO Resp. 31–32 (arguing “Claim 1 (and thus dependent Claims 11–14) requires that the ‘single motion of engagement urging the base of said humidification chamber adjacent and in contact with said chamber heater’”). For the reasons discussed above in Section III.B.3.b, we are persuaded by a preponderance of the evidence that claim 1 is unpatentable over Netzer and Levine.

Thus, in view of the record developed after trial, we are persuaded by a preponderance of the evidence that claims 11–14 are unpatentable over Netzer and Levine.

C. Dependent Claim 5

Claim 5 depends from claim 1 and recites “wherein said gases line outlet includes a connector for receiving a breathing hose and at least one

auxiliary electrical connection plug or socket or pneumatic connection plug or port, for a simultaneous connection when connecting a breathing circuit having complementary electric or pneumatic connectors.”

Petitioners contend that Netzer, Levine, and Bahr would have rendered claim 5 obvious. Pet. 43–49.

1. *Bahr (Ex. 1011)*

Bahr relates to a “conduit used in a fluid flow path connecting a fluid transfer device to a patient” Ex. 1011 ¶ 2. Figure 3 of Bahr is reproduced below.

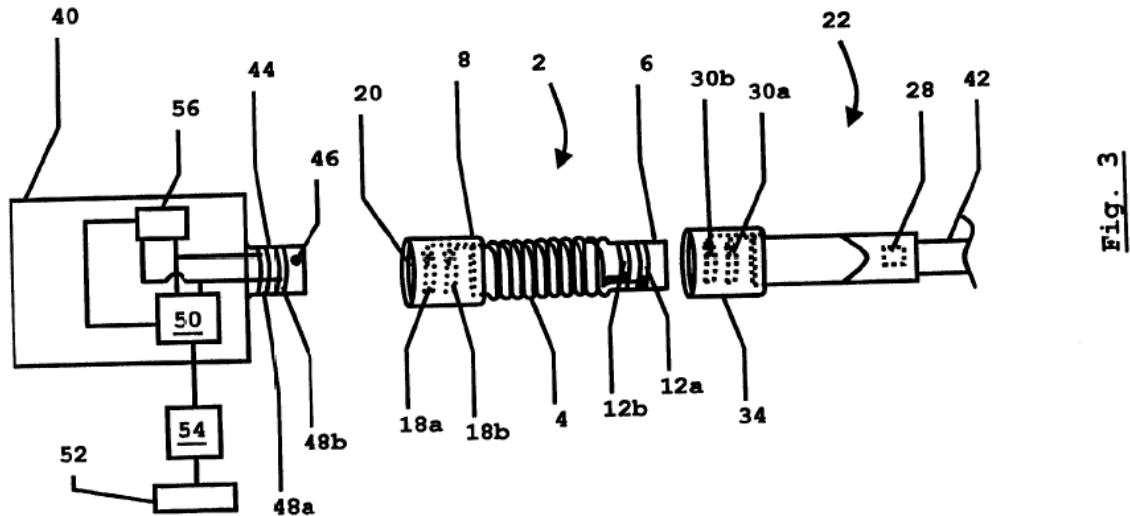


Figure 3 shows elements of a fluid transfer system for transfer of gas between airways of a patient and a fluid transfer device, such as ventilator 40. *Id.* ¶¶ 17, 21. Ventilator 40 has gas port 44 with external mating surface 46 and two electrical contacts 48a, 48b. *Id.* ¶ 22. Flexible tubing 4 includes female interface 8 and electrical contacts 18a, 18b on inner surface 20 of interface 8. *Id.* Contacts 18a, 18b, 48a, 48b “are disposed on their respective surfaces 46, 20 such that when the female interface 8 is push fit over the port 44 to thereby form a gas tight connection, the contacts 48a and

48b and 18a and 18b will establish an electrical connection.” *Id.* Similar connections can be made at male interface 6, contacts 12a, 12b, 30a, 30b, and female interface 34. *Id.* ¶ 23. The contacts are for “sensor 28, such as a solid state pressure transducer or a flow meter” (*id.* ¶ 20), “sensor 28 to provide a visible indication on a display 54 of monitored properties of the gas” (*id.* ¶ 24), or “detector 56 . . . in order to detect whether a sensor is connected” (*id.* ¶ 25).

2. Analysis

Petitioners argue that Netzer and Levine teach or suggest the limitations of claim 1, from which claim 5 depends. Pet. 43 (citing Virr Decl. ¶¶ 49–57, 69, 70, 99, 100), 48 (claim chart). Petitioners rely on Bahr to teach or suggest explicitly the additional limitations of claim 5. *Id.* at 43–44 (citing Ex. 1011 at ¶ 22; Virr Decl. ¶¶ 59–62, 99, 100), 48–49.

Petitioners assert that one of ordinary skill in the art would have combined Netzer, Levine, and Bahr “in order to minimize the work required for a patient to connect a breathing hose, and any electrical components of the hose, to a CPAP machine.” *Id.* at 46–47 (citing Virr Decl. ¶¶ 99–100). Petitioners also assert that one of ordinary skill in the art would have combined the asserted references in order to address “auxiliary transmission lines” that “would ‘produce additional installation work for the user, more difficult transportation of the patient, and an increased risk of accidental user or patient interaction with the lines which might cause involuntary disconnection of the external elements or a potential health hazard.’” *Id.* at 47 (quoting Ex. 1011 ¶ 6; citing Virr Decl. ¶¶ 99–100). Petitioners contend that one of ordinary skill in the art would have been motivated to combine the Netzer, Levine, and Bahr “to simplify the manner in which connections

were made on a CPAP machine or humidifier.” *Id.* at 48 (citing Ex. 1003, 5:10–27; Virr Decl. ¶¶ 99–100). In particular, Petitioners contend that:

For example, rather than needing to establish a fluid connection between a patient hose and *Netzer*’s gas outlet 4 separately from an electrical connection for a heater wire in the hose, the teachings of *Bahr*’s system would allow the patient to establish both the fluid connection and the electrical connection simultaneously.

Pet. 47–48 (citing Virr Decl. ¶ 100).

Petitioners, however, do not cite to any portion of *Netzer* or *Levine* that teaches “any electrical components of the hose” or “an electrical connection for a heater wire in the hose.” *See* Pet. 17–21 (asserted teachings of *Netzer*), 21–22 (asserted teachings of *Levine*), 43–44; Ex. 1008; Ex. 1009. Petitioners also do not explain how its proposed combination of *Netzer* and *Levine* results in “any electrical components of the hose” or “a heater wire in the hose” so that an electrical connection would be needed. *See* Pet. 46–48. Even if one of the asserted references could be said to teach an electrical component of the hose or a heater wire in the hose, upon reviewing Dr. Schneider’s testimony (Schneider Decl. ¶¶ 104–105) and Mr. Virr’s testimony (Virr Decl. ¶ 21), we are not persuaded that a person of ordinary skill in the art would have added such an electrical component or heater wire to the hose of *Netzer* as modified by *Levine* and *Bahr*.

Bahr teaches contacts for “sensor 28, such as a solid state pressure transducer or a flow meter” (Ex. 1011 ¶ 20), “sensor 28 to provide a visible indication on a display 54 of monitored properties of the gas” (*id.* ¶ 24), or “detector 56 . . . in order to detect whether a sensor is connected” (*id.* ¶ 25). *See also* Schneider Decl. ¶ 104 (“*Bahr* teaches a detector attached to its electrical contacts to detect whether a sensor is connected”); PO Resp. 50

(stating the same in an argument why references would not be combined). Netzer does not disclose an electrical component of the hose or a heater wire in the hose, let alone the sensor like the one in Bahr. Netzer discloses a “spring-loaded electric switch” to turn off Netzer’s humidifier upon removal of its liquid chamber (Ex. 1008, 6), but Netzer does not describe this switch as requiring any “electrical components of the hose” or “a heater wire in the hose.”

Levine discloses “temperature sensor inputs **91** and **92**” and “various temperature warning lights and alarm indicators” to “provide water to a patient at a temperature which is as comfortable as possible” (see Ex. 1009, 4:14–23), and that “[i]t has been found that the temperature of humidified gas measured at the outlet **24** [of the humidifier 10] is approximately 99° F” (*id.* at 5:3–4; see also *id.* at Figs. 1, 2, 5). Petitioners do not direct us to any disclosure within Levine that describes the wires or sensors that connect to temperature sensor inputs 91 and 92 as residing within Levine’s humidifier hose, or that temperature is measured anywhere other than at Levine’s outlet 24 of humidifier 10 (see Ex. 1009, 5:3–4).

We are not persuaded that a person of ordinary skill in the art would have modified Netzer to include these multiple components, as Petitioners propose, when doing so would needlessly add cost and complexity. Because the asserted references do not address an electrical component or heater wire in a hose of a CPAP machine, Petitioners’ articulated reasoning has insufficient rational underpinnings.

Thus, based on the preceding, Petitioners do not persuade us that claim 5 is unpatentable over Netzer, Levine, and Bahr.

D. Claims 6, 9, 22, and 23

Claim 6 is independent and recites a “humidifier chamber for use with a gases humidification apparatus” Claims 9, 22, and 23 depend directly from claim 6. Petitioners contend that claims 6, 9, 22, and 23 are unpatentable over Netzer (Ex. 1008), Levine (Ex. 1009), and Dickinson (Ex. 1016). Pet. 5, 50–60. Netzer and Levine are discussed above in Sections III.B.1 and III.B.2.

1. Dickinson (Ex. 1016)

Dickinson relates to “water chambers for ‘slide-on’ humidifiers and CPAP machines.” Ex. 1016, 1:6–8. Figure 2 of Dickinson is reproduced below.

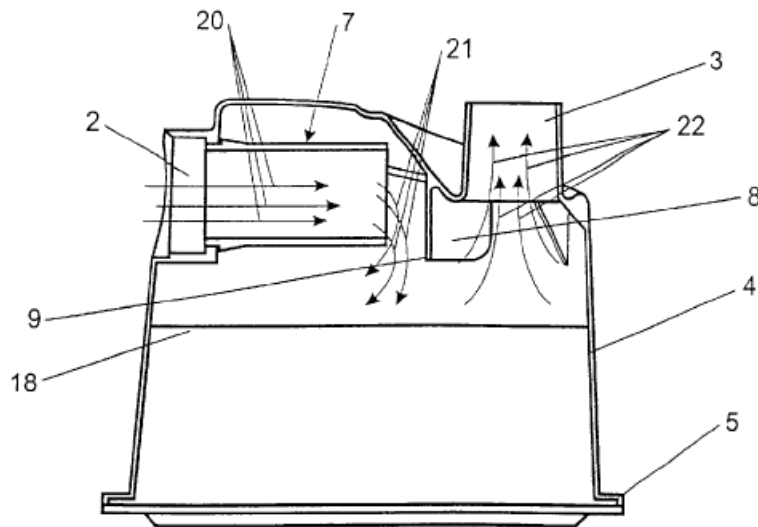


FIGURE 2

Figure 2 is a cross sectional side elevation of a water chamber. Ex. 1016, 1:64–65, 2:25–26. The water chamber of Figure 2 is “particularly for use in a portable CPAP machine adapted to receive slide-on chambers and which makes the gases inlet connection to the chamber in the same slide-on

motion.” *Id.* at 2:12–15. Chamber 1 has transparent shell 4, gases outlet 3, gases inlet 2, and inlet extension tube 7. *Id.* at 2:15–28.

Dickinson states “water chamber 1 includes an inlet extension tube 7 extending inwardly into the chamber interior from the periphery of the gases inlet 2” and that “inlet extension tube 7 acts as a weir against water flow back through gases inlet 2 upon tilting of the chamber 1.” Ex. 1016, 2:25–28, 2:59–61, Fig. 6.

2. Analysis

a. Uncontested Teachings

Petitioners persuade us that Netzer teaches nearly all of the limitations of independent claim 6. Pet. 50–52, 55–60 (claim chart). In particular, we find that Netzer teaches a “humidifier chamber for use with a gases humidification apparatus” with “a container defining a water chamber having an aperture in the bottom, with a surrounding wall and top.” Ex. 1008, 8, 9, 10, Figs. 1–4; *see also* Pet. 56 (citing Ex. 1008, 8–10, Figs. 1–3; Virr Decl. ¶¶ 49–57). Also, we find that Levine teaches “a container defining a water chamber having an aperture in the bottom, with a surrounding wall and top.” Ex. 1009, 2:51–55 (“humidifier cartridge 10 includes a humidifier housing 14”), 3:30–32 (“housing 14 . . . includes a central conductive portion 50”), Fig. 2; *see also* Pet. 56 (citing Ex. 1009, 2:51–55, 3:30–32, Fig. 2; Virr Decl. ¶¶ 69, 70).

We further find that Netzer and Levine each teaches “a heat conductive base enclosing said aperture in the bottom of said water chamber.” Ex. 1008 9, 10; Ex. 1009, 2:51–55, 3:30–32, Fig. 2; *see also* Pet. 56–57 (citing Ex. 1008, 9, 10; Ex. 1009, 2:51–55, 3:30–32, Fig. 2; Virr Decl. ¶¶ 69, 70).

We find that Netzer teaches “a gases inlet to said container adapted to receive a substantially horizontal flow of gases into said container.” Ex. 1008, 9, Figs. 1, 2, 4; *see also* Pet. 57 (citing Ex. 1008, 9, Figs. 1, 2, 4; Virr Decl. ¶¶ 49–57). We also find that Netzer teaches “a gases outlet from said container adapted to deliver adapted to deliver a substantially horizontal flow of gases gases out of said container.” Ex. 1008, 9, Figs. 1, 2, 4; *see also* Pet. 57–58 (citing Ex. 1008, 9, Figs. 1, 2, 4 Virr Decl. ¶¶ 49–57).

We further find that Netzer teaches “said gases inlet and said gases outlet being aligned, such that said humidifier chamber may make operable engagement with a humidified gases delivery apparatus in a single motion.” Ex. 1008, 8, 10–12, Figs. 1, 2; *see also* Pet. 58 (citing Ex. 1008, 8, 10–12, Figs. 1, 2; Virr Decl. ¶¶ 49–57).

We additionally find that Dickinson teaches “at least one extension tube extending horizontally inward into said humidifier chamber from an inner periphery of said gases inlet and/or gases outlet,” as recited by claim 6. Ex. 1016, 2:20–21 (“The chamber includes a horizontally aligned gases inlet 2”), 2:26–28 (“the water chamber 1 includes an inlet extension tube 7 extending inwardly into the chamber interior from the periphery of the gases inlet 2”); *see also* Pet. 58–59 (citing Virr Decl. ¶¶ 67–68; Ex. 1016, 2:20–21, 2:25–28).

We find that Netzer and Levine each teaches “wherein said single motion disposes said heat conductive base adjacent a heater in said humidified gases delivery apparatus,” the final recitation of claim 6. Ex. 1008, 10; Ex. 1009, 4:34–38; Virr Decl. ¶¶ 52–54, 56, 70; *see also* Pet. 59 (citing Ex. 1008, 10; Ex. 1009, 4:34–38; Virr Decl. ¶¶ 69, 70, 94–96).

Turning to the challenged claims that depend from claim 6, Petitioners persuade us that Netzer, Levine, and Dickinson teach the limitations of claims 9, 22, and 23, which depend directly from claim 6. Pet. 59–60 (citing Ex. 1008, 9, Figs. 1, 2, 4; Ex. 1016 at 2:20–21, 2:25–28, 3:5–9, Fig. 2; Virr Decl. ¶¶ 49–57, 67–70, 80).

We find that Dickinson teaches “the at least one extension tube comprises an elongate inlet extension tube extending into said humidifier chamber from an inner periphery of said gases inlet,” as recited by claim 9. Ex. 1016, 2:20–21, 2:26–28 (“the water chamber 1 includes an inlet extension tube 7 extending inwardly into the chamber interior from the periphery of the gases inlet 2”), Fig. 2; *see also* Pet. 59–60 (citing Ex. 1008, 9, Figs. 1, 2, 4; Virr Decl. ¶¶ 49–57, 67–70, 80; Ex. 1016, 2:20–21, 2:25–28). As discussed below, Petitioners provide arguments that Dickinson would be applied to the gases outlet so as to teach or suggest “an elongate outlet extension tube extending into said humidifier chamber from the inner periphery of said gases outlet,” as also recited by claim 9.

Petitioners persuade us that Netzer teaches “said gases inlet and said gases outlet are parallel to each other,” as recited by claim 22. Ex. 1008, 9, Fig. 1, 2, 4; *see also* Pet. 60 (citing *id.* Ex. 1008, 9, Fig. 1, 2, 4; Virr Decl. ¶¶ 49–57). Petitioners also persuade us that Dickinson teaches “said at least one extension tube is releasably coupled to said container,” as recited by claim 23. Ex. 1016, 3:5–9 (“extension tube 7 is preferably provided as a snap fit to the inlet”); *see also* Pet. 60 (citing *id.* Ex. 1016, 3:5–9; Virr Decl. ¶¶ 67, 68).

Patent Owner presents no specific arguments regarding the limitations discussed above. *See* PO Resp. 4–6, 20–29; *see also* 37 C.F.R. § 42.23(a)

(“Any material fact not specifically denied may be considered admitted.”); Paper 10, 3 (“The patent owner is cautioned that any arguments for patentability not raised and fully briefed in the response will be deemed waived.”).

b. Reason for Combining

In Section III.B.3.c, we determined that Petitioners have shown that one of ordinary skill in the art would have had reason to combine Netzer and Levine and would have had a reasonable expectation of success in combining these references.

Petitioners assert that one of ordinary skill in the art would have combined Netzer, Levine, and Dickinson “to implement the well-known and conventional components like using extension tubes for a water container providing humidified gas via an inlet and outlet.” Pet. 53 (citing Virr Decl. ¶¶ 103–105). Petitioners contend that Netzer is silent on an extension tube, but Dickinson has a similar water chamber 1 with inlet extension tube 7. *Id.* (citing Ex. 1008, 9; Ex. 1016, 2:25–28, 2:59–61, Figs. 2, 6; Virr Decl. ¶¶ 67–68). Petitioners argue that Dickinson indicates the advantages of having extension tube 7, such as preventing water flow out of inlet 2 and improved flow pattern. Pet. 53–54 (citing Ex. 1016, 2:54–57, 2:59–61, Fig. 6). Petitioners also argue that one of ordinary skill in the art would have understood these advantages and would have been prompted to add such an extension tube “to prevent water from flowing out of the inlet 22 and outlet 23, which both have a horizontal orientation (like *Dickinson*’s inlet 2) along the same sidewall of the container 9, when the container 9 is tilted” and to prevent potential damage to Netzer’s flow generator and user. *Id.* at 54–55 (citing Virr Decl. ¶¶ 103–105). Petitioners further argue that one of ordinary

skill in the art would have understood that the snap fit of Dickinson's extension tube 7 "would provide a releasable coupling of the extension tube" and so would have been prompted to incorporate such a coupling "to allow users to install/remove extension tubes from *Netzer's* container 9, which can allow for cleaning, replacement, and other maintenance." *Id.* at 55 (citing Virr Decl. ¶¶ 103–105).

The record supports Petitioners' contentions that "components like using extension tubes for a water container providing humidified gas via an inlet and outlet" were known. Pet. 53. The record also supports that one of ordinary skill in the art would have understood the advantages of Dickinson and would have been prompted to add Dickinson's extension tube "to prevent water from flowing out of the inlet 22 and outlet 23, which both have a horizontal orientation (like *Dickinson's* inlet 2) along the same sidewall of the container 9, when the container 9 is tilted" and to prevent potential damage to Netzer's flow generator and user. Pet. 53–55. The record further supports one of ordinary skill in the art would have incorporated the snap fit of Dickinson's extension tube for cleaning, replacement, or other maintenance. Pet. 55. We credit the testimony of Mr. Virr regarding these contentions. Virr Decl. ¶¶ 103–105. We, therefore, determine that one of ordinary skill in the art would have had a reason to combine the teachings of Netzer, Levine, and Dickinson.

We also credit Mr. Virr's testimony that the proposed combination of Netzer, Levine, and Dickinson would be "implement[ing] the well-known and conventional components like using extension tubes for a water container providing humidified gas." Virr Decl. ¶ 103. Thus, we determine

that one of ordinary skill in the art would have had a reasonable expectation of success in combining the teachings of Netzer and Levine.

Patent Owner responds that Petitioners provide no evidence that extension tubes were well-known or conventional, only general and conclusory arguments. PO Resp. 44–45 (citing Pet. 53–55; Virr Decl. ¶¶ 103–105). Patent Owner also responds that Petitioners provide no specific similarity that would prompt one of ordinary skill in the art to add an extension tube. *Id.* at 45 (citing Pet. 53; Schneider Decl. ¶¶ 140–162).

We find that Dickinson provides evidence that extension tubes related to “water chambers for ‘slide-on’ humidifiers and CPAP machines” (Ex. 1016, 1:6–8) were known in the art. *See also* Pet. 52 (contending that Dickinson is prior art under 35 U.S.C. § 102(a) and § 102(e)). The record includes no argument or evidence that Dickinson would not be prior art to the ’547 patent.

Patent Owner also responds that “Petitioners fail to consider express teachings of Netzer that demonstrate spillage would not have been a problem.” PO Resp. 46 (citing Pet. 54). Patent Owner argues that “Netzer discloses . . . a drainage spout and discharge line . . . that prevents water from entering the respiratory line.” *Id.* at 46–47 (citing Ex. 1008, 6, 7, 9, Fig. 4; Schneider Decl. ¶ 149). Patent Owner contends that drainage system of Netzer would make it less likely for water to reach the inlet or outlet opening and thus, together with its guide elements and wide footprint, Netzer solves the problem addressed by Petitioners’ proposed combination. *Id.* at 47–50 (citing Ex. 1008, 10, Figs. 1–3; Schneider Decl. ¶¶ 145–147).

Netzer, however, teaches that its drainage spout 20 is for “[w]hen the liquid container 9 is overfilled” so that “excess liquid is diverted out of the

gas humidifier 5 via the drainage spout 20” Ex. 1008, 9. We agree with Petitioners that Netzer’s drainage spout does not address spillage. Pet. Reply 20–22 (citing PO Resp. 46–48; Ex. 1008, 6, 7; Ex. 1016, 2:59–61, Fig. 6; 2d Virr Decl. ¶¶ 32, 33). Dickinson also states that “where the CPAP machine is adapted for use with slide-on humidifier chambers, and the connection of the chamber to the machine is accomplished within the single sliding movement, the inlet port is consequently provided horizontally through a side of the chamber.” Ex. 1016, 1:24–29. According to Dickinson, “[l]ocating the inlet port in the side of the chamber significantly increases the likelihood of water spillage from the chamber if the chamber is tilted with water therein.” *Id.* at 1:29–32. Dickinson, thus, provides evidence that spillage from tipping was a recognized problem in a water container like the one in Netzer, which is connected through an inlet on its side. See Ex. 1008, Figs. 1–4.

Patent Owner further responds that one of ordinary skill in the art would not have been motivated to add extension tubes due to a noise issue. PO Resp. 50–53 (citing Pet. 53–55). Patent Owner contends that Netzer does not indicate any noise issue and Petitioners do not explain why noise would be a problem. *Id.* at 51–52. Patent Owner argues that “Netzer’s water container is enclosed by the humidifier housing 8” and thus, “would serve to muffle any noise within the water chamber.” *Id.* at 52 (citing Ex. 1008, 8, Figs. 2–4; Schneider Decl. ¶ 153). Patent Owner also points to structural differences between the water container of Netzer and the water chamber of Dickinson. *Id.* at 52–53 (citing Ex. 1008, 9, Figs. 1–4; Ex. 1016, 2:20–23, 2:35–37, Figs. 1, 2; Schneider Decl. ¶¶ 154, 157)

Dickinson, however, indicates that in a water chamber like the one in Netzer which is connected through an inlet on its side, an extension tube would reduce noise by providing an improved flow pattern to the inlet flow. Ex. 1016, 1:20–24, 2:54–59. Moreover, Netzer relates to treating sleep apnea. See Ex. 1008, 2 (“The invention relates to a gas supply device for sleep apnea”). The record provides no persuasive reason why the noise level of a CPAP machine would not be an issue.

Patent Owner also argues that adding extension tubes to Netzer and Levine as modified by Dickinson would have diminished performance because such tubes would bypass surface area of water in the chamber and reduce humidification. PO Resp. 53 (citing Schneider Decl. ¶¶ 158–159). Patent Owner further argues that adding extension tubes would increase cost and complexity and “would not provide any meaningful benefit.” *Id.* at 53–54 (citing Schneider Decl. ¶ 159). The record persuades us that Dickinson provides at least the benefits of preventing spillage and reducing noise, and those benefits provide a reason for one of ordinary skill in the art to combine the Netzer, Levine, and Dickinson.

Claim 9 recites “wherein the at least one extension tube comprises . . . an elongate outlet extension tube extending into said humidifier chamber from the inner periphery of said gases outlet.” Patent Owner additionally responds that adding extension tubes would have increased the cost and complexity without providing any meaningful benefit. PO Resp. 54–57 (citing Virr Decl. ¶¶ 104, 105; Ex. 1016, 1:20–24, 1:32–34, 2:26–28, 2:54–57; Schneider Decl. ¶¶ 140–162). The testimony of Patent Owner’s declarant does not provide sufficient evidence that the additional cost and

complexity would outweigh the benefits of the extension tubes discussed above. *See* Schneider Decl. ¶ 159.

For the reasons discussed above regarding Petitioners' reason for adding the extension tube of Dickinson to both the inlet and outlet, Petitioners persuade us that one of ordinary skill in the art would have added an extension tube to the outlet because it is at the same level as the inlet. *See* Pet. 54–55 (arguing that one of ordinary skill in the art would have added the extension tube of Dickinson to prevent water flow out of the inlet and outlet when the humidification chamber is tilted). Thus, based on our review of the record, we find that Dickinson provides at least the benefits of preventing spillage and reducing noise to an outlet on the side of a water container like the one in Netzer, and those benefits provide a reason for one of ordinary skill in the art to combine the Netzer, Levine, and Dickinson.

Therefore, based on the foregoing, Petitioners persuade us by a preponderance of the evidence that claims 6, 9, 22, and 23 are unpatentable over Netzer, Levine, and Dickinson.

IV. CONCLUSION

For the foregoing reasons, based on the full record before us, we determine that Petitioners have demonstrated, by a preponderance of the evidence, that claims 1, 6, 9, 11–14, 22, and 23, but not claim 5, of the '547 patent are unpatentable.

V. ORDER

Accordingly, it is:

ORDERED that claims 1, 6, 9, 11–14, 22, and 23 of U.S. Patent No. 8,091,547 B2 have been shown, by a preponderance of the evidence, to be unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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