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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JEFFREY WILLIAM ROBINSON,
NEAL PAUL, and JOHN MAHONEY

Appeal 2020-000932
Application 14/476,246
Technology Center 3700

Before ANTON W. FETTING, ULRIKE W. JENKS, and
AMEE A. SHAH, *Administrative Patent Judges*.

JENKS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ files this appeal from Examiner’s decision to reject claims 1–10 and 12–20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Twin City Fan Companies, Ltd. Appeal Br. 2.

STATEMENT OF THE CASE

Claims 1–10 and 12–20 are on appeal, and can be found in the Claims Appendix of the Appeal Brief. Claim 1 is representative of the claims on appeal, and reads as follows (with added paragraphing and bracketing for reference):

1. A fan assembly, comprising:
 - [(1)] an impeller;
 - [(2)] a rotatable shaft coupled to a center of the impeller;
and
 - [(3)] a housing covering at least a portion of the impeller,
the housing including:
 - [(a)] at least two housing portions joined together
at a seam;
 - [(b)] a reinforcing channel covering an extending
portion of the seam; and
 - [(c)] a reinforcing layer adhered over the seam on
an inside of the housing.

Appeal Br. 14 (Claims Appendix). The other independent claims, claims 7, 12, and 18, similarly recite a fan housing having a seam covered with a reinforcing layer on both the inside and outside of the housing.

REFERENCE(S)

The prior art relied upon by Examiner is:

Name	Reference	Date
Bowles et al. (Bowles")	US 3,300,122	Jan. 24, 1967
Grinbergs	US 7,374,399 B2	May 20, 2008
Hancock et al. ("Hancock")	US 7,381,028 B2	June 3, 2008
Schofield	US 2010/0050553 A1	Mar. 4, 2010

In addition, Examiner relies on the following non-patent literature:

Sealed and Insulated Fiber Board Ducts | Building America Solution Center, <https://web.archive.org/web/20130226220625/http://basc.pnnl.gov>

/resource-guides/sealed (last accessed Aug. 31, 2017) (“DOE”).

Martin Holladay, *Sealing Ducts: What’s Better, Tape or Mastic?*
<https://web.archive.org/web/20130216064405/http://www.greenbuildingadvisor.com/blogs> (last accessed Aug. 31, 2017) (“Holladay”).

Sina Ebnesajjad, *Chapter 8 Characteristics of Adhesive Materials*,
Handbook of Adhesives and Surface Preparation (1st ed. 2010) (“Sina”).

REJECTION(S)

Appellant requests review of the following grounds of rejections made by Examiner:

- I. Claims 1–10 and 12–20 under 35 U.S.C. § 103(a) as unpatentable over Hancock, Schofield, DOE, and Holladay;
- II. Claims 1–3, 6–8, 10, 12, 13, 15, 18, and 19 under 35 U.S.C. § 103(a) as unpatentable over Bowles, Grinbergs, DOE, and Holladay; and
- III. Claims 4, 5, 9, 16, 17, and 20 under 35 U.S.C. § 103(a) as unpatentable over Bowles, Grinbergs, DOE, Holladay, and Schofield;
- IV. Claim 14 under 35 U.S.C. § 103(a) as unpatentable over Bowles, Grinbergs, DOE, Holladay, and Sina.

I. Obviousness over Hancock, Schofield, DOE, and Holladay

The issue is whether the preponderance of evidence of record supports Examiner’s conclusion that the combination of references provides a fan housing having a seam, wherein the seam is covered on both sides with a fabric reinforced covering as claimed.

A. Findings of Fact (FF)

FF1. Hancock teaches a fan assembly having a housing made of two portions that joined together at a parting line, i.e. a seam. See Hancock 2:32–42, see Figure 2 (not shown). Figure 20 of Hancock, reproduced below, shows a fan assembly:

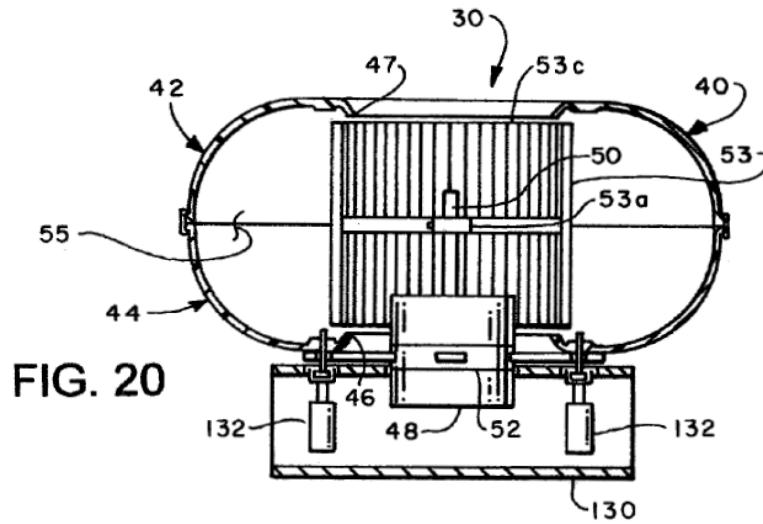


Figure 20 shows a fan assembly containing a motor and a blower housing 40 made of two parts 42 and 44, and a seam where part 42 and 44 meet along the parting line. See 4:32–42, 7:55–56; see Final Act. 4.

FF2. Hancock teaches that “[h]ousing parts 42 and 44 are not true mirror image parts in that housing part 42 includes a perimeter groove 81, . . . which is adapted to receive flange 80 of housing part 44 when the two parts are joined together.” Hancock 6:6–10, see also Figure 8 and 13. “Housing part 44 is provided with an axially projecting perimeter flange 80.” *Id.* 5:17–19, see also Figures 3 and 5. Housing parts 42 and 44 may be secured to each other with a clip or cleat. *Id.* 6:48–49.

FF3. Schofield teaches a connection between composite panels formed using structural bonding tape. Schofield, Abstract, see also ¶¶ 9–10. Figure 5A of Schofield, reproduced below, shows such a connection.

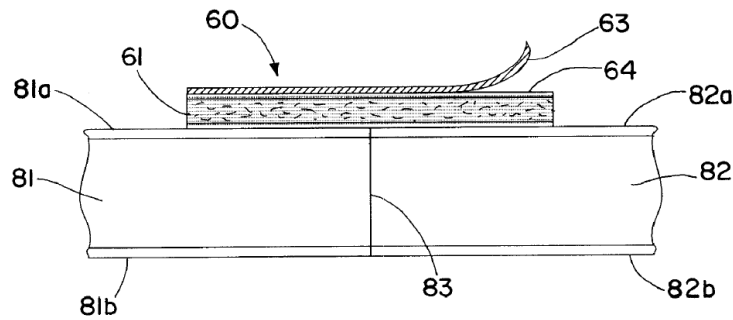


FIG. 5A

- Figure 5A shows a bonding tape 60 adhered to surface 81a and 82a over seam 83 of panels 81 and 82. *Id.* ¶ 64. The tape may also be applied to the opposite surface 81b and 82b over seam 83. *Id.* Tape 60 is made of impregnated reinforcement fabric containing adhesive resin 61. *Id.* “Once the adhesive layer is cured, a solid structural connection 65 between the first panel 81 and the second panel 82 is formed.” *Id.*
- FF4. DOE teaches sealing fiber board used in HVAC systems. DOE teaches that mastic and glass fiber fabric are used to make connections with the fiberboard in the HVAC system. DOE 2.² DOE teaches that pressure-sensitive aluminum foil tape of heat activated aluminum foil/scrim tape may also be used to make connections in HVAC systems. *Id.*
- FF5. Holladay teaches that ducts in an air handling system may be sealed with duct tape which is “technically known as cloth-backed rubber-adhesive duct tape.” Holladay 2.
- FF6. The Specification provides
a portion of the first housing portion 202 and the second housing portion 204 include extending portions 203 and 205

² The reference does not contain page number, we count the pages consecutively starting from the first page.

than extend away from the housing 200 to form an extending portion 212. In the example shown, the second reinforcing layer or layers 230 form a channel that covers the extending portion 212.

Spec. ¶ 19, *see also* ¶¶ 35, 40.

B. Analysis

Examiner finds that Hancock teaches elements 1–3a of claim 1. *See* Final Act. 4; FF1, FF2. Examiner acknowledges that Hancock does not teach elements 3b and 3c of claim 1 and looks to Schofield for supplying these elements. Final Act. 4; FF3. Based on these disclosures, Examiner concludes:

It would have been obvious to one of ordinary skill in the art at the time the invention was filed to join the inner seam of the housing, as taught by Hancock, with a reinforcing layer adhered over the seam, as taught by Schofield, to provide additional reinforcement (Hancock Col. 4, lines 30-35) for the purpose of strengthening the walls by acting as an additional support which completely joins the seam (Schofield Paragraphs [0009], [0010]); furthermore it was within ordinary skill in the art to supplement the join[t], as taught by Hancock, with at least one layer of reinforcement adhered, as taught by Schofield, on the inside of the housing since the simplest installation of layered reinforcement would be on the flat inside surface. The Examiner further notes, that DOE and Holladay both demonstrate the commonality of reinforcing and adhering seams of adjoining composite surfaces with a fiber reinforced composite, particularly within the field of air movement. (*See* Non-patent literature DOE and Holladay).

Final Act. 6; *see* FF1–FF5.

Appellant contends (1) that the art relied upon by Examiner is non-analogous art (*see* Appeal Br. 9 (“one of ordinary skill in the art would not look to [a] teaching from the home/building construction arts or duct taping to combine with a fan housing.”)); (2) that there is insufficient motivation

for the combination (*id.* at 9–11; *see* Reply Br. 2–4); and (3) that the rejection relies on hindsight (Appeal Br. 11).

We have reviewed Appellant’s contentions in light of Examiner’s cited art and find that the preponderance of the evidence supports Examiner’s conclusion that the claims are obvious. We address Appellant’s contentions below:

As Examiner explains, any need or problem known in the field of endeavor at the time of the invention can provide a reason for combining the elements in the manner claimed. Ans. 3 (*citing KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007)).

[A] reference is analogous art to the claimed invention if: (1) the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention).

Ans. 4 (*citing In re Bigio*, 381 F.3d 1320, 1325 (2004)). Hancock is directed to a fan motor and housing. FF1 and FF2. As discussed above, Examiner relies on Hancock for teaching elements 1–3a of claim 1 and in Schofield for teaching elements 3b and 3c of claim 1. Final Act. 4. Specifically, Examiner relies on Schofield for reinforcing seams of composite structures by providing additional support that completely joins the seams. *Id.* Examiner finds that “Schofield solves the same problem as identified by the Instant Application (i.e. of reinforcing seams of a composite material).” Ans. 4. Because Schofield solves the problem of reinforcing seams, Examiner concludes that it is analogous art to the present claims. *Id.* Additionally, Examiner finds that Holladay and DOE are analogous art because they are in “the same field of endeavor; namely fans, blowers, ductwork systems,

Heating Ventilation and Air Conditioning (HVAC) systems, vacuum air pumps, etc.” *Id.* We agree with Examiner that the evidence of record supports a finding that the references are reasonably pertinent to problem faced by the inventor and thereby analogous art. Accordingly we are not persuaded by Appellant’s non-analogous art arguments.

The combination of Hancock and Schofield provides a fan housing having a channel as recited in the claims. Examiner finds that “Hancock creates the seam that forms the structure of the channel for which the Schofield tape is applied.” Ans. 6, *see also* Ans. 5 (“Housing part 44 is provided with an axially projecting perimeter flange 80 at edge 66, see FIGS. 3 and 5,’ ([Hancock] col. 5, ln. 17-18), as clearly shown in Fig. 2 [of Hancock], the flange 80 is seen to be radially projecting adjacent to parting line 49.”); *see* FF1–FF3. Here, Hancock already teaches reinforcing the seam by adding cleats or clips along the seam edge in order to hold the seam together. FF2. Applying Schofield’s tape, as suggested by Examiner, provides an alternative way to keep the two parts of the fan housing unit together at the seam while simultaneously reinforcing the seam. *See* Final Act. 2 (“there is a reasonable result of added reinforcement to the seam when adding reinforcing tape to the seam.”). Furthermore, “[w]hen the bonding tape of Schofield is applied to the radially projecting flange of Hancock, [Examiner finds that] a channel is formed.” Ans. 5. We find no error with Examiner’s finding that adding the fiber reinforced tape of Schofield over the radially projecting flange of Hancock results in a structure that resembles the channel as set out in the Specification. *See* FF6. Accordingly, we find that the record supports the conclusion that the

combination of references teaches a fan housing having a channel as claimed.

Examiner identifies the teachings of Schofield, Holladay, and DOE as providing the motivation to seal cracks or seams in an HVAC unit. *See* Ans. 7–8; FF3–FF5. We agree with Examiner that Schofield teaches making a solid structural connection between two composite pieces by applying the tape to the seam. FF3. This teaching in conjunction with the teachings of DOE and Holladay to seal seams in HVAC systems provides sufficient motivation to apply the same sealing techniques to a fan housing that is also used in an HVAC system as taught by Hancock. Accordingly, we are not persuaded by Appellant’s contention that Examiner has not articulated a sufficient motivation for combining the references.

We are not persuaded by Appellant’s contention that Examiner relies on hindsight to arrive at the conclusion that the claims are rendered obvious based on the cited art. Appeal Br. 11; Reply Br. 4. While we are fully aware that hindsight bias often plagues determinations of obviousness, *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966), we are also mindful that the Supreme Court has clearly stated that the “combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416.

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 applicant's disclosure, such a reconstruction is proper.

In re McLaughlin, 443 F.2d 1392, 1395, (CCPA 1971). Appellant has not directed us to any information relied on by Examiner that could have only

been gleaned from Appellant's Specification and was not available in the references cited by Examiner. Here, Examiner relies on the disclosure of Hancock for teaching a fan housing having a seam and Schofield for teaching two composite material fastened together using fabric reinforced tape. Final Act. 4–18; *see* FF1–FF3. The application of Schofield's tape over Hancock's fan seam reasonably bonds the two portions of the housing together and in the process forms a channel as recited in the claims. *See* Ans. 5. (“When the bonding tape of Schofield is applied to the radially projecting flange of Hancock, a channel is formed.”). Accordingly, we are not persuaded by Appellant's contention that Examiner resorted to hindsight in formulating the rejection.

C. Conclusion

We conclude that the evidence cited by Examiner supports a prima facie case of obviousness with respect to claim 1 and Appellant has not provided persuasive argument or evidence to rebut the prima facie case. As Appellant does not argue the claims separately, claims 2–10 and 12–20 fall with claim 1. 37 C.F.R. § 41.37 (c)(1)(iv).

II.–IV. Obviousness over Bowles, Grinbergs, DOE, and Holladay

The issue is whether the preponderance of evidence of record supports Examiner's conclusion that the combination of references provides a fan housing having a seam, wherein the seam is covered on both inside and outside surfaces with a reinforced covering as claimed.

A. Findings of Fact (FF)

FF7. Bowles teaches a manually operated ventilator. *See* Bowles

Figure 1. Bowles teaches that the ventilator casing 37 is made

of two halves 39 and 41 that are held together by continuous projecting flange on the marginal edges of halves 39 and 41. *See* Bowles 2:28–42, Figures 1–5. “The other half 41 of casing 37 is secured as by bolts passing through a continuous flange on its marginal edges to a corresponding flange on the marginal edges of half 39, so that the two casing halves are releasably secured together in assembled relationship.” Bowles 2:33–38.

FF8. Grinbergs teaches a fan housing comprising an exhaust housing 10 and an inlet housing 12 that form a cavity containing a motorized impeller. Grinbergs 5:23–36. Grinbergs teaches that the components making up the fan assembly “may be connected using any known means such as for example, duct tape, screws, nails, adhesive etc.” *Id.* at 8:59–60.

B. Analysis

We consider the rejections together because the same issue is dispositive for all the rejections relying on the combination of Bowles, Grinbergs, DOE, and Holladay. *See* App. Br. 13: (“the additional references of Schofield and Sina fail to cure the rejection based on Bowles, Grinbergs [, DOE,] and Holladay for at least the reasons outlined above.”).

Examiner finds that Bowles teaches elements 1–3a of claim 1. *See* Final Act. 18–19; FF7. Examiner acknowledges that Bowles does not teach elements 3b and 3c of claim 1 and looks to Grinbergs for supplying these elements. Final Act. 19; FF8. Based on these disclosures, Examiner concludes:

It would have been obvious to one of ordinary skill in the art at the time the invention was filed to join the inner seam of the housing, as taught by Bowles, with a reinforcing channel

covering an extending portion of the seam and a reinforcing layer adhered over the seam, as taught by Grinbergs, since Grinbergs teaches “the components of the fan assembly shown generally in FIGS. 2 and 3 may be connected using any known means such as for example, duct tape, screws nails, adhesives etc.” (See Grinbergs, Col. 8, lines 35-60) and applying a reinforcing layer over the housing of Bowles would result in the reinforcing channel; furthermore it was within ordinary skill in the art to supplement the join, as taught by Bowles, with at least one layer of reinforcement adhered, as taught by Grinbergs, on the inside of the housing since the simplest installation of layered reinforcement (e.g. fiberglass duct tape) would be on the flat inside surface. The Examiner further notes, that DOE and Holladay both demonstrate the commonality of reinforcing and adhering seams of adjoining composite surfaces with a fiber reinforced composite, particularly within the field of air movement. (See Non-patent literature DOE and Holladay)

Final Act. 19–20.

Appellant contends that Grinbergs does not teach a reinforcing layer (Appeal Br. 12), and that none of the references shows a channel as claimed (*id.*). We have reviewed Appellant’s contentions in light of Examiner’s cited art and find that the preponderance of the evidence supports Examiner’s conclusion that the claims are obvious. We address Appellant’s contentions below:

We are not persuaded by Appellant’s contention that the references in combination do not teach a channel as recited in the claims. Examiner identifies the teachings of Grinbergs, Holladay, and DOE as providing the motivation to seal cracks or seams in an HVAC system. Specifically, Examiner finds that

Grinbergs discloses it is obvious to connect fan assemblies such as one with a connection channel (best seen in FIGS. 1, 2 [of Grinbergs]) as disclosed by Bowles [(see Figures 1 and 5 of Bowles)], with a reinforcing layer, such as duct tape, for the

purpose of providing the well-known in the art function of sealing the parts as taught by [Holladay] and DOE.

Ans. 11; *see* FF4, FF5, FF7, FF8. The application of Grinbergs' duct tape over Bowles' flange reasonably bonds Bowles' two halves together and in the process forms a channel of reinforced material. *See* Ans. 10 ("applying a reinforcing layer over the housing of Bowles would result in the reinforcing channel.").

The Specification describes a channel as a reinforcing layer that covers an extending portion of a fan housing. *See* FF6 ("the second reinforcing layer or layers 230 form a channel that covers the extending portion 212."). Examiner relies on Bowles for teaching a fan and housing having two portions. Final Act. 19. Specifically, Bowles teaches a projecting flange that has an extending portion that is held together by bolts. FF7. Examiner relies on Grinbergs for teaching the use of duct tape to connect a fan assembly by covering the seam. Final Act. 19; FF8. "[T]he components of the fan assembly shown generally in FIGS. 2 and 3 [of Grinbergs] may be connected using any known means such as for example, duct tape, screws nails, adhesives etc." Final Act. 19, FF8. We find no error with Examiner's conclusion that the addition of duct tape to the seams of a fan assembly for the purpose of reinforcing and sealing the seams is reasonably supported by Grinbergs, and further supported by Doe or Holladay that teach sealing seams in an air handling system. *See* Final Act. 19–20 ("DOE and Holladay both demonstrate the commonality of reinforcing and adhering seams of adjoining composite surfaces with a fiber reinforced composite, particularly within the field of air movement."). Because the combination as proposed by Examiner would result in Bowles' flange being covered with duct tape to secure and further support the flange seam of the fan housing, we agree with

Examiner's finding that the combination would result in a channel as described in the Specification. Accordingly, we are not persuaded by Appellant's contention that the combination of references does not teach a channel as claimed.

We are also not persuaded by Appellant's hindsight argument as Appellant has not directed us to any information relied on by Examiner that could have only been gleaned from Appellant's Specification and was not available in the references cited by Examiner.

C. Conclusion

We conclude that the evidence cited by Examiner supports a prima facie case of obviousness with respect to claim 1 and Appellant has not provided persuasive arguments or evidence to rebut the prima facie case. As Appellant does not argue the claims separately, claims 2, 3, 6–8, 10, 12, 13, 15, 18, and 19 fall with claim 1. The rejection of claims 4, 5, 9, 14, 16, 17, and 20 additionally relying on either Schofield or Sina in conjunction with Bowles, Grinbergs, DOE, and Holladay are also not argued separately and fall for the same reason outlined above for claim 1.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–10, 12–20	103	Hancock, Schofield, DOE, Holladay	1–10, 12–20	
1–3, 6–8, 10, 12, 13, 15, 18, 19	103	Bowles, Grinbergs, DOE, and Holladay	1–3, 6–8, 10, 12, 13, 15, 18, 19	

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
4, 5, 9, 16, 17, 20	103	Bowles, Grinbergs, DOE, Holladay, Schofield	4, 5, 9, 16, 17, 20	
14	103	Bowles, Grinbergs, DOE, Holladay, Sina	14	
Overall Outcome			1–10, 12–20	

TIME PERIOD FOR RESPONSE

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

AFFIRMED