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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ERIC D. BOL

Appeal 2018-008130
Application 14/729,420
Technology Center 3600

Before MICHELLE R. OSINSKI, GEORGE R. HOSKINS, and
SEAN P. O’HANLON, *Administrative Patent Judges*.

HOSKINS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner’s decision to reject claims 1–3, 7, 8, 10–12, 15–18, and 21–28 in this application. *See, e.g.*, Appeal Br. 1. The Board has jurisdiction over the appeal 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. Appellant identifies The Boeing Company as the real party in interest. Appeal Br. (filed Mar. 23, 2018) 2.

CLAIMED SUBJECT MATTER

Claim 1 illustrates the claimed subject matter on appeal, and it recites, with our emphases added:

1. A nacelle inlet of an aircraft engine comprising:
 - a lipskin on a forward end of the nacelle inlet;
 - an outer barrel on an exterior of the nacelle inlet, the outer barrel extending rearwardly from the lipskin;
 - an inner barrel on an interior of the nacelle inlet, the inner barrel extending rearwardly from the lipskin; and,
 - an aft bulkhead on the nacelle inlet, the aft bulkhead having an outer edge connected to the outer barrel and the aft bulkhead having an inner edge connected to the inner barrel, *the aft bulkhead having a curved configuration as the aft bulkhead extends from the outer edge of the aft bulkhead to the inner edge of the aft bulkhead, the outer edge of the aft bulkhead being positioned rearwardly of the inner edge of the aft bulkhead.*

Appeal Br. 11 (Claims App.) (emphases added).

REJECTIONS ON APPEAL²

All pending claims 1–3, 7, 8, 10–12, 15–18, and 21–28 are rejected under 35 U.S.C. § 103 as unpatentable over Porte (US 2012/0090694 A1, pub. Apr. 19, 2012) and Lumbab (US 2015/0314882 A1, pub. Nov. 5, 2015).

All pending claims also are rejected under 35 U.S.C. § 103 as unpatentable over Porte and Binks (US 2010/0260602 A1, pub. Oct. 14, 2010).

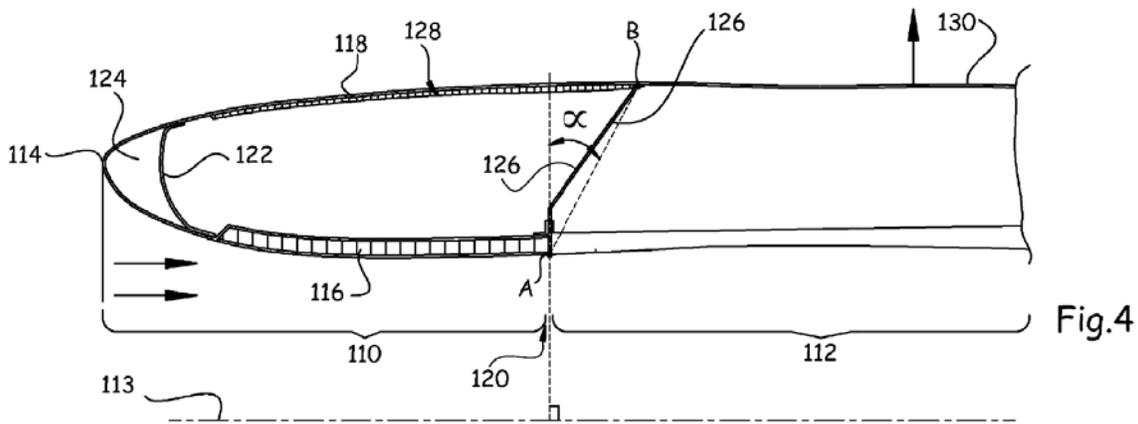
² A rejection of claim 11 under 35 U.S.C. § 112(b) for indefiniteness was overcome by an After-Final Amendment entered by the Examiner. *See* Final Act. (dated Nov. 1, 2017) 2; Amendment (filed Dec. 19, 2017) 4–5, 9; Advisory Act. (dated Dec. 28, 2017) (entering the Amendment, and stating it “has overcome the following rejection(s): 112(b) of claim 11”).

OPINION

A. *Obviousness over Porte and Lumbab*

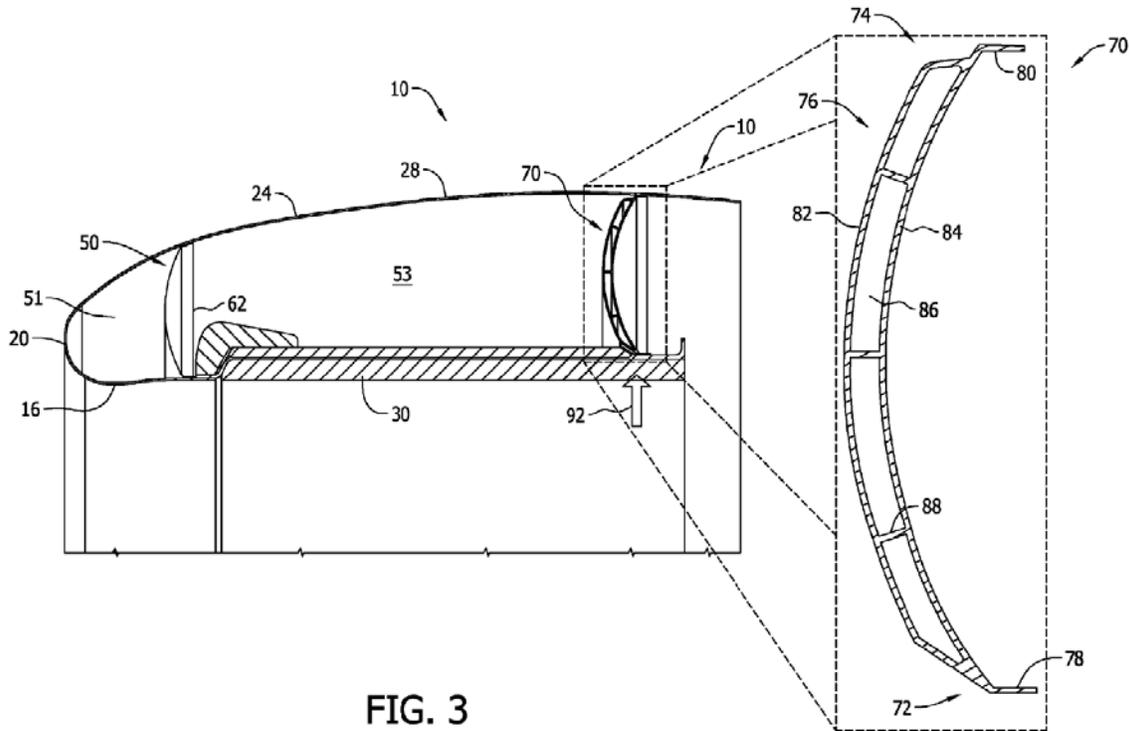
Appellant argues for the patentability of all pending claims as a group over Porte and Lumbab, without arguing for any claim separately from the other claims. *See* Appeal Br. 3–9. We select claim 1 to decide the appeal of this rejection of these claims. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2017).

The Examiner finds Porte discloses each and every limitation of claim 1, except that Porte’s aft bulkhead does not have a *curved configuration* as recited in claim 1. Final Act. 3. Porte’s Figure 4 is reproduced here:



As described in Porte, Figure 4 is a cutaway view of an aircraft nacelle comprising air intake 110 and power plant 112, with rear frame 126 of air intake 110 connecting inside wall 116 and outside wall 118. Porte ¶¶ 22, 26, 28–29. The Examiner cites Porte’s rear frame 126 as corresponding to an aft bulkhead having an outer edge (i.e., point “B”) *positioned rearwardly of* an inner edge (i.e., point “A”), as recited in claim 1. Final Act. 3; Ans. 4. As can be seen in Figure 4, Porte’s aft bulkhead 126 does not have the *curved configuration* required by claim 1.

The Examiner finds Lumbab discloses an aft bulkhead having a curved configuration. Final Act. 3. Lumbab's Figure 3 is reproduced here:



As described in Lumbab, Figure 3 is a cross-sectional view of engine nacelle 10, including an enlarged view of aft bulkhead 70 which extends between inner barrel 30 and outer barrel 28. Lumbab ¶¶ 10, 25. As can be seen in Figure 3, Lumbab's aft bulkhead 70 exhibits a curved configuration as it extends from its inner end 72 to its outer end 74. *Id.* ¶¶ 25–26.

The Examiner determines it would have been obvious to modify Porte's aft bulkhead 126, which already has an outer edge *positioned rearwardly of* an inner edge, to have a *curved configuration* as it extends from the inner edge to the outer edge as disclosed by Lumbab, thereby resulting in the invention of claim 1. Final Act. 3. This would have been done, according to the Examiner, to achieve “the predictable advantage of

distributing impact loads and eliminating the need for crush zone components.” *Id.* (citing Lumbab ¶¶ 14, 21).

Appellant argues the rejection is deficient because neither Porte nor Lumbab discloses, as recited in claim 1, an “aft bulkhead having a curved configuration as the aft bulkhead extends from the outer edge of the aft bulkhead to the inner edge of the aft bulkhead, the outer edge of the aft bulkhead being positioned rearwardly of the inner edge of the aft bulkhead.” Appeal Br. 11 (Claims App.); *id.* at 3–6. Instead, Appellant argues, Porte’s aft bulkhead 126 “extends as a straight line between point A and point B,” so it is not curved as claimed. *Id.* at 5–6. Lumbab’s aft bulkhead 70, meanwhile, “extend[s] radially between the inner barrel 30 and the outer barrel 28,” so it does not have an outer edge positioned rearwardly of an inner edge as claimed. *Id.* at 6. Thus, Appellant’s view is that the claimed subject matter “is only present in [Appellant’s] [S]pecification,” such that the Examiner has relied improperly on hindsight to glean the claimed subject matter from the prior art. *Id.* at 3–4, 7–9. Appellant additionally objects to the Examiner’s reliance on Lumbab’s paragraph 21 in support of obviousness, because that disclosure “refers to ‘alternative implementations’ of the positioning of the forward bulkhead [50] and aft bulkhead [70], not alternative embodiments of the aft bulkhead [70].” *Id.* at 6–8.

The Examiner answers that, while “[A]ppellant is correct in asserting that neither [Porte nor Lumbab] discloses *all* of these limitations individually,” “[o]ne cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.” Ans. 3 (emphasis by Examiner) (citing *In re Keller*, 642 F.2d 413 (CCPA 1981) and *In re Merck & Co.*, 800 F.2d 1091 (Fed. Cir. 1986)). The

Examiner finds the combination of Porte and Lumbab leads to the invention of claim 1, because Porte's aft bulkhead 126 has "an outer edge (at B) rearward of an inner edge (at A) with an angled arrangement" even if bulkhead 126 is not curved, and Lumbab's aft bulkhead 70 is "curved . . . without the angling." *Id.* at 4. The Examiner maintains that the "alternative embodiments" described in Lumbab's paragraph 21 "refer[] not just to the axial spacing, but also the radial extension," and further teach more generally "that adjusting the radial or axial positioning of the bulkhead is a reasonable modification unless the bulkhead is rendered inoperative," with no evidence to establish such inoperability being presented here. *Id.* at 4–5.

Upon review of the foregoing, we sustain the Examiner's rejection. A preponderance of the evidence supports the Examiner's finding that Porte discloses an aft bulkhead 126 having an outer edge at point "B" positioned rearwardly of an inner edge at point "A", as recited in claim 1. *See* Porte, Fig. 4, ¶¶ 26, 29, 39–40 ("the point B is offset toward the rear of the nacelle relative to the point A"). A preponderance of the evidence also supports the Examiner's finding that Lumbab discloses an aft bulkhead 70 having a curved configuration, as the bulkhead extends between its inner and outer edges, as recited in claim 1. *See* Lumbab, Fig. 3, ¶¶ 25–26 ("Aft bulkhead 70 includes an inner end 72, an outer end 74, and a curvilinear body portion 76 extending therebetween."). Appellant's argument that Porte and Lumbab each, individually, fail to disclose an aft bulkhead that has an outer edge positioned rearwardly of an inner edge, *and* a curved configuration, does not identify any error in the foregoing findings.

The Examiner, additionally, provides a rational underpinning to support the obviousness of modifying Porte's aft bulkhead 126, which

already has an outer edge positioned rearwardly of an inner edge, to have a curved configuration in light of Lumbab. In this regard, the Examiner cites Lumbab's paragraph 14. *See* Final Act. 3. Lumbab therein discloses an aft bulkhead that "include[s] a curvilinear body portion," such as curvilinear portion 76 of aft bulkhead 70, is thereby:

able to receive an impact load, from a birdstrike, for example, and transfer that load circumferentially about the circumference of the nacelle. Furthermore, the curvilinear body portion of the aft bulkhead is configured to react to radial loads caused by a fan blade out event. As such, the exemplary engine nacelle eliminates the need for an additional crush zone component to react to the radial load. . . . Accordingly, the . . . aft bulkhead[] facilitate[s] reducing the part count of the engine nacelle and provide[s] for a lighter, less expensive, and more easily serviceable engine nacelle.

Lumbab ¶ 14; *see also id.* ¶¶ 28–29 (curved configuration of aft bulkhead 70 advantageously distributes axial loads generated by foreign objects penetrating forward bulkhead 50 to reach aft bulkhead 70, and distributes radial loads generated by a fan blade out event within the engine, thereby eliminating the need for a crush zone component). These disclosures, which Appellant does not address in its arguments on appeal, provide a rational basis for the Examiner's conclusion of obviousness.

We tend to agree with Appellant's position that Lumbab's additional disclosure in paragraph 21 does not, by itself, suggest modifying Porte's aft bulkhead 126 to have a curved configuration. Nonetheless, neither does it contradict the Examiner's determination of obviousness, based on Lumbab's paragraph 14.

For the foregoing reasons, we sustain the rejection of all pending claims as having been obvious over Porte and Lumbab.

B. Obviousness over Porte and Binks

The Examiner’s rejection of all pending claims as having been obvious over Porte and Binks relies on Porte as discussed above in connection with the rejection over Porte and Lumbab. Final Act. 4. The Examiner then finds “Binks teaches curved bulkheads as alternatives for ‘flat’ bulkheads,” because Figures 2–4 of Binks illustrate a “bulkhead within the nacelle at the front may be either flat or curved,” so flat and curved bulkheads are “*functional equivalents*.” *Id.* at 5; Ans. 5 (emphasis added). The Examiner determines it would have been obvious to modify Porte’s aft bulkhead 126, which is flat, to have a curved configuration in light of Binks, “as these are art-recognized alternative shapes for providing nacelle inlet stiffeners, and further for the advantages understood by one of ordinary skill that are noted above.” Final Act. 5.

Appellant objects that the rejection based upon Porte and Binks “relies on impermissible hindsight.” Appeal Br. 9. For the following reasons, we agree.

The evidence of record does not establish that a *flat* bulkhead is functionally equivalent to a *curved* bulkhead. We appreciate that Figure 2 of Binks shows a flat forward bulkhead 260, and Figures 3 and 4 of Binks each show a curved forward bulkhead (unnumbered). Nonetheless, the Examiner does not cite, and we cannot find, any disclosure in Binks tending to show that these alternative bulkhead designs are functionally equivalent. Moreover, other evidence of record suggests that flat bulkheads function differently from curved bulkheads. That is, Lumbab discloses how a curved bulkhead is configured to receive an axial impact load by *axially compressing*. Lumbab ¶ 28. Further, a curved bulkhead is configured to

receive a radial impact load by *compressing in the radial direction* to absorb a portion of the load. *Id.* ¶ 29. A flat bulkhead would not appear to react to axial impact loads and radial impact loads in those manners. Thus, the evidence of record does not support the Examiner’s finding that a flat bulkhead is functionally equivalent to a curved bulkhead.

The Examiner’s rejection additionally cites “the advantages understood by one of ordinary skill that are noted above” in support of obviousness over Porte and Binks. Final Act. 5. Presumably, the Examiner is referring to the advantages of curved bulkheads disclosed by Lumbab, cited in connection with the first rejection. *See id.* at 3. However, Lumbab is not expressly cited in connection with the second rejection, and also the Examiner does not explain how Lumbab’s disclosure inter-relates with the respective disclosures of Porte and Binks, so as to support the second rejection which cites only Porte and Binks. *Id.* at 4–5.

For the foregoing reasons, we do not sustain the rejection of all pending claims as having been obvious over Porte and Binks.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References	Affirmed	Reversed
1–3, 7, 8, 10–12, 15–18, 21–28	103	Porte, Lumbab	1–3, 7, 8, 10–12, 15–18, 21–28	
1–3, 7, 8, 10–12, 15–18, 21–28	103	Porte, Binks		1–3, 7, 8, 10–12, 15–18, 21–28
Overall Outcome			1–3, 7, 8, 10–12, 15–18, 21–28	

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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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED