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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TORBEN JACOB and JOACHIM PIEPENBROCK

Appeal 2017-005589
Application 12/227,679
Technology Center 1700

Before DONNA M. PRAISS, AVELYN M. ROSS, and
SHELDON M. MCGEE, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's decision to reject claims 1–3, 5, 6, 8, 9, 12–21, and 24–26, which constitute all the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ In explaining our decision, we refer to the Specification filed Nov. 24, 2008 (“Spec.”), the Final Office Action entered Mar. 24, 2016 (“Final Act.”), the Appeal Brief filed Oct. 20, 2016 (“App. Br.”), the Examiner's Answer entered Dec. 15, 2016 (“Ans.”), and the Reply Brief filed Feb. 15, 2017 (“Reply Br.”).

BACKGROUND

The subject matter on appeal relates to “a method for producing a fiber composite component, in particular for aerospace.” Spec. 1:5–6. The Specification further describes “a molding core for producing such a fiber composite component” and “a fiber composite component with at least one stringer which is produced by means of such a molding core and/or such a method.” *Id.* at 1:6–9. Claim 1, the sole independent claim, is representative and reproduced below from page 18 (Claims Appendix) of the Appeal Brief (disputed limitations italicized):

1. A method for producing a fiber composite component, comprising:
 - providing a molding tool;
 - introducing a core sleeve into the molding tool for establishing an outer geometry of a molding core to be formed;
 - providing reinforcing corner profiles in opposing corners of the molding tool, wherein the corner profiles include an outer geometry that conforms to an inner geometry of the molding tool;
 - filling the core sleeve with a vacuum-fixable filling material;
 - applying a vacuum to the core sleeve to vacuum-fix the vacuum-fixable filling material, thereby forming a rigid molding core that is compressed within the core sleeve between portions of the corner profiles, wherein the molding core is elongated and comprises a length along a first axis and a width along a second axis that is orthogonal to the first axis, wherein the length is greater than the width;
 - opening the molding tool and removing the molding core, the core sleeve, and the corner profiles therefrom;
 - applying a release layer to the core sleeve, thereby reducing adhesive attachment of a semifinished fiber composite product to the core sleeve;

arranging the molding core, the core sleeve, and the corner profiles on a surface of a base part comprising semifinished fiber composite products, wherein the molding core is arranged so that the first axis is substantially parallel to the surface of the base part; and

laying at least one semifinished fiber product over the molding core, the core sleeve, the corner profiles, and the surface of the base part for shaping the fiber composite component to be produced.

Claims 8 and 15 each depend from claim 1 and further recite, respectively, “wherein providing reinforcing corner profiles comprises providing a braided carbon fiber reinforced plastic (CRP) gusset or an extruded plastic gusset” and “wherein the core sleeve is formed from an elastic or a flexible material.” App. Br. 19, 20.

REJECTIONS ON APPEAL²

1. Claims 1–3, 5, 6, 8, 9, 12, 13, 15–18, 20, 21, 24, and 25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Teufel³ in view of Lunde,⁴ Grose,⁵ and Forster.⁶

2. Claims 14 and 26 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Teufel in view of Lunde, Grose, Forster, and Gardner.⁷

3. Claim 19 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Teufel in view of Lunde, Grose, Forster, and Goodno.⁸

ANALYSIS

Appellants⁹ present arguments concerning only claims 1, 8, and 15. Their arguments are directed principally towards the Examiner's reliance on Teufel, and Appellants do not distinguish among the different grounds of rejection. In accordance with 37 C.F.R. § 41.37(c)(1)(iv), and based upon the lack of arguments directed to the subsidiary rejections, claims 2, 3, 5, 6, 9, 12–14, 16–21, and 24–26 will stand or fall together with independent claim 1 from which they depend.

² The Examiner additionally rejected claims 24 and 26 under 35 U.S.C. § 112, first paragraph, and claim 26 under 35 U.S.C. § 112, second paragraph. Final Act. 3–5. Appellants do not argue these rejections on appeal, therefore, we summarily affirm the Examiner's rejections of claims 24 and 26.

³ US 2004/0216805 A1, pub. Nov. 4, 2004.

⁴ US 6,692,681 B1, iss. Feb. 17, 2004.

⁵ US 2006/0188696 A1, pub. Aug. 24, 2006.

⁶ US 5,897,739, iss. Apr. 27, 1999.

⁷ US 5,260,121, iss. Nov. 9, 1993.

⁸ US 5,262,121, iss. Nov. 16, 1993.

⁹ The real party in interest is identified in the Appeal Brief as Airbus Deutschland GmbH. App. Br. 1.

After review of the cited evidence in the appeal record and the opposing positions of Appellants and the Examiner, we determine that Appellants have not identified reversible error in the Examiner's rejections. Accordingly, we affirm the rejections for reasons set forth below, in the Final Action, and in the Examiner's Answer. *See generally* Final Act. 5–23; Ans. 5–44.

Claim 1

Concerning claim 1, the Examiner finds that the claimed method would have been obvious to a person having skill in the art at the time of the invention in view of the teachings of Teufel, Lunde, Grose, and Forster for the reasons stated on pages 5 through 15 of the Final Office Action.

Appellants contend the Examiner reversibly erred in rejecting claim 1 because Teufel (1) is silent regarding providing media volumes in opposing corners of a molding tool, (2) is silent regarding a planar surface of a base part comprising semifinished fiber composite products, (3) fails to disclose a fuselage that is arranged over a planar surface longitudinally as claimed, and (4) fails to disclose providing reinforcing corner profiles in opposing corners of the molding tool. App. Br. 10. Appellants further contend that even if Teufel is combined with Lunde to split the form tool in order to facilitate removal of the mandrel and molding core, the combination would not have resulted in the claimed method because Teufel wraps a filament with resin around the bladder so that the fuselage is formed around the mandrel, which would result in gaps between the tail section and the planar surface. *Id.* at 11–12.

Appellants also argue that Grose's disclosure of two laminate sheets and a core arranged between does not disclose a corner profile as claimed in

claim 1 because Grose's composite structure is already a final product and not suitable to form a molding core wherein at least one semi-finished fiber product is laid over the molding core. *Id.* at 13. Similarly, Appellants assert that Forster fails to compensate for the deficiencies of Teufel, Lunde, and/or Grose because it does not disclose a molding tool, introducing a core sleeve, providing reinforcing corner profiles in opposing corners of the molding tool wherein the corner profiles include an outer geometry that conforms to an inner geometry of the molding tool as required by the claim or arranging the molding core, core sleeve, and corner profiles on a planar surface of a base part comprising semifinished fiber composite products. *Id.* at 14. In addition, Appellants argue that because Teufel provides no guidance for making the modifications proposed by the Examiner, a skilled artisan would not have had a reasonable expectation of success. *Id.* at 15.

The Examiner responds that Teufel teaches the bladder can be an elastomeric material comprising silicone or latex and that elastomer by definition is any various elastic substance resembling rubber and elastic by definition is capable of being easily stretched or expanded and resuming former shape. Ans. 25 (citing Teufel ¶¶ 33, 38, 49). The Examiner also finds that Teufel's disclosure of the void pocket collapsing inward evidences that the bladder is flexible and/or elastic in order for this to occur. *Id.* at 26 (citing Teufel ¶ 57). Regarding geometry, the Examiner further finds that Teufel discloses corner profiles 930 inside bladder 610 such that an outer geometry conforms to an inner geometry of molding tool 710 and has a length along a first access and a width along a second access. *Id.* at 31 (citing Teufel Figs. 7–10). The Examiner finds that form tool 710 is separated from mandrel 600 in Figure 10 of Teufel, therefore, form tool 710

must separate at the split lines to facilitate removal. *Id.* at 32. The Examiner further finds that since the inner surface of the mold and the mandrel have the same shape, it would have been obvious that the molding core would be substantially parallel to the inner surface of the external mold in order to form a fuselage having the desired exterior shape. *Id.* at 34–35.

Regarding Appellants’ distinctions over the secondary references, the Examiner responds that Appellants’ arguments are over the references individually rather than the combination (*id.* at 29–30, 41–42) and that Appellants’ assertion that the combination has no reasonable expectation of success is not supported by evidence as each of Teufel, Lunde, Grose, and Forster are all in the same field of endeavor of making fiber composites for aircraft (*id.* at 40). The Examiner points out that (1) Lunde was cited for disclosing removal of a molding core from a form tool along split lines, (2) Grose was cited to evidence that it was known to make fiber reinforced composite for aircraft and to provide reinforcing corner profiles in opposing corners of a molding core for the benefit of maximizing the structural integrity and rigidity of the bladder and to form a desired fuselage shape, and (3) Forster was cited to show that it was well-known in the art of making fiber composite for aircraft to place a release film between a molding device and a composite material. *Id.* at 37–39, 41–42. The Examiner further responds that claim 1 neither recites nor requires a “planar surface” as Appellants contend. *Id.* at 43.

In the Reply Brief, Appellants maintain that Teufel discloses a “stiff pre-molded silicon bag” rather than an elastic and/or flexible core sleeve. Reply Br. 3–7. According to Appellants, none of the cited references discloses a release layer to a core sleeve to reduce adhesive attachment of a

semifinished fiber composite product because Forster's release film is positioned between a breather ply and an uncured composite skin. *Id.* at 8. Appellants contend that Forster's configuration differs from that shown in Figure 5 of Appellants' Specification. *Id.* at 9–10.

Appellants' arguments do not persuade us of reversible error in the rejection of claim 1. In this proceeding, we interpret the claims according to their broadest reasonable interpretation consistent with the Specification. *See, e.g., In re Bigio*, 381 F.3d 1320, 1324 (Fed. Cir. 2004). Appellants do not persuasively explain why the broadest reasonable interpretation of claim 1 requires that the "base part" in the claimed method is planar.

Appellants appear to ask us, effectively, to read the word "planar" into claim 1. We decline to do so. *Cf. In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow [S]cope and breadth of language [should be] explored, and clarification imposed."). Appellants point to nothing persuasive in the Specification that would counsel in favor of the construction that they propose. In the context of the broadest reasonable interpretation applicable to this proceeding, Appellants' arguments do not persuade us that the scope of the claim should be so limited. Accordingly, Appellants' argument fails to persuade us of reversible error in the rejection.

Appellants' argument distinguishing Forster based on an embodiment disclosed in Figure 5 of Appellants' Specification is also not persuasive of error because the Examiner cites Teufel for teaching the molding tool and core sleeve steps (*see, e.g., Ans.* 30) and relies on Forster for the general teaching of the use of release films in making a fiber composite for aircraft

and the placement between a molding device and a composite material (*see, e.g.,* Ans. 38–39).

Even if we were to consider Appellants’ new argument raised for the first time in the Reply Brief that Forster requires a breather ply between the release film and a vacuum bag (Reply Br. 8), Appellants’ argument is not persuasive because it seeks to bodily incorporate an embodiment of Forster into the teachings of Teufel. “The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981); *see also In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) (“[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.”); *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) (“Combining the teachings of references does not involve an ability to combine their specific structures.”). Rather, “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

Similarly, Appellants’ argument distinguishing Grose is unpersuasive because it distinguishes the secondary reference based on a bodily incorporation of Grose’s support 20 and core 16 in Teufel’s method for producing a fiber composite component. Appellants assert that Grose’s support members 20 are bonded at each end of Grose’s core 16, not suitable to be removed, and are stiffer than the core, thus, Grose’s core 16 does not

form a corner profile as required by claim 1. App. Br. 13–14. Appellants do not dispute the Examiner’s finding (Ans. 37) that Grose teaches support members 20 located in opposing corners of a molding core. Nor do Appellants dispute the Examiner’s determination (*id.* at 38) that it would have been obvious to a skilled artisan in view of the combination of cited references to incorporate Teufel’s teaching of a plurality of pre-filled contained media volumes at the plurality of regions of transition along the longitudinal axis of the mandrel, including at opposing corners, to maximize the structural integrity and rigidity of the bladder taught by Teufel. Therefore, we are not persuaded that the Examiner reversibly erred in combining the teachings of Grose with Teufel and the other cited references.

Finally, Appellants fail to rebut the Examiner’s finding (Ans. 25) that Teufel teaches the bladder can be an elastomeric material comprising silicone or latex and that such material by definition is elastic and/or flexible. The Examiner’s findings are supported by the record. *See, e.g.*, Teufel ¶¶ 33, 38, 49. Accordingly, we find Appellants’ arguments unpersuasive of error by the Examiner.

For the above reasons, and in view of the positions presented by the Examiner and Appellants, we discern no reversible error in the Examiner’s conclusion that the subject matter of claim 1 would have been obvious over the cited prior art. We affirm the Examiner’s rejection of claim 1.

Claim 8

Concerning claim 8, the Examiner finds that the claimed method would have been obvious to a person having skill in the art at the time of the invention in view of the teachings of Teufel, Lunde, Grose, and Forster as evidenced by Tikuisis (US 2005/0070644 A1, pub. Mar. 31, 2005) and

Yadav (US 2005/0126338 A1, pub. June 16, 2005) for the reasons stated on page 16 of the Final Office Action.

Appellants contend the Examiner reversibly erred in rejecting claim 8 because Teufel is silent regarding providing media volumes 930 in opposing corners of a molding tool let alone reinforcing corner profiles comprising a braided carbon fiber reinforced plastic gusset or an extruded plastic gusset. App. Br. 15–16.

The Examiner responds that Teufel explicitly discloses that its contained media volume 930 can be made of plastic films, which the Examiner identifies as a plastic gusset, and is further evidenced by Tikuisis and Yadav. Ans. 43 (citing Teufel ¶ 59).

In the Reply Brief, Appellants do not dispute the Examiner’s finding that Teufel teaches its contained media volume can be made of plastic films, i.e., a plastic gusset.

We are not persuaded of reversible error by the Examiner based on the cited record in this Appeal. Appellants’ argument that Teufel does not disclose providing media volumes in opposing corners does not address the rejection made by the Examiner, which is over the combination of Teufel with the teachings of Lunde, Grose, and Forster. Moreover, the Examiner concludes that it would have been obvious to modify Teufel to provide reinforcing corner profiles in opposing corners of a molding core as recited in claim 1, from which claim 8 depends, in view of Grose’s disclosure of support members 20 in opposing corners of molding core 16. Ans. 37–38 (citing Grose ¶¶ 24–25). The Examiner reasonably determines that it would have been obvious to do so for the benefit of maximizing the structural integrity and rigidity of Teufel’s bladder 610 and would allow Teufel’s

bladder 610 to form the desired shape of the fuselage. *Id.* at 38. In addition, the Examiner's finding that Teufel discloses its contained media volume can be made of plastic films is supported by the record and not disputed by Appellants. Teufel ¶ 59; *see generally* Reply Br.

Accordingly, we affirm the Examiner's rejection of claim 8 for the reasons discussed above in addition to those provided in the Final Office Action and the Examiner's Answer.

Claim 15

Concerning claim 15, the Examiner finds that the claimed method would have been obvious to a person having skill in the art at the time of the invention in view of the teachings of Teufel, Lunde, Grose, and Forster for the reasons stated on page 17 of the Final Office Action.

Appellants contend the Examiner reversibly erred in rejecting claim 15 because Teufel's bladder 610 is a stiff pre-molded silicon bag and, therefore, is not an elastic or flexible material. App. Br. 16.

We are not persuaded by Appellants' argument for the same reasons discussed above in connection with claim 1. Accordingly, we affirm the Examiner's rejection of claim 15.

CONCLUSION

We AFFIRM the Examiner's rejections of claims 1–3, 5, 6, 8, 9, 12–21, and 24–26.

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

AFFIRMED