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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PAUL K. OLDROYD,
WEI-YUEH LEE, JAMES D. HETHCOCK JR.,
JOHN R. MCCULLOUGH, and
PATRICK R. TISDALE

Appeal 2019-001462
Application 14/022,524
Technology Center 3700

Before MICHAEL L. HOELTER, ANNETTE R. REIMERS, and
LISA M. GUIJT, *Administrative Patent Judges*.

REIMERS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1 and 3–20. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Bell Helicopter Textron Inc. Appeal Brief (“Appeal Br.”) 1, filed July 9, 2018.

CLAIMED SUBJECT MATTER

The claimed subject matter “relates to a composite rotor blade, as well as a method of making the composite rotor blade.” Spec. ¶ 1, Figs. 1–5.

Claims 1 and 18 are independent.

Claim 1 is illustrative of the claimed subject matter and recites:

1. An airfoil member having a root end, a tip end, a leading edge, and a trailing edge, the airfoil member comprising:

an upper skin;

a lower skin; and

a composite core member comprising at least two adjacent cell members, each of the cell members being a hexagonal tubular structure, an upper surface network of the at least two adjacent cell members being bonded to the upper skin, and a lower surface network of the at least two adjacent cell members being bonded to the lower skin, wherein the at least two adjacent cell members are generally tubular;

wherein a planar or bent planar septum is disposed laterally between the at least two adjacent cell members, the planar or bent planar septum being configured to provide tailored characteristics of the airfoil member;

wherein the planar or bent planar septum does not separate the upper surface network from the upper skin and wherein the planar or bent planar septum does not separate the lower surface network from the lower skin; and

wherein each of the at least two adjacent cell members are in contact with a substantially vertical wall of the planar or bent planar septum and at least one of the upper skin and the lower skin.

THE REJECTIONS

- I. Claims 1, 3, 4, 9, 13–15, and 18–20² stand rejected under 35 U.S.C. § 102(b) as anticipated by Doolin (US 5,346,367, issued Sept. 13, 1994).
- II. Claim 5 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Doolin and Hand (US 2009/0263627 A1, published Oct. 22, 2009).
- III. Claims 6–8, 16, and 17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Doolin and Lee (US 9,096,316 B2, issued Aug. 4, 2015).
- IV. Claims 10–12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Doolin.

ANALYSIS

Rejection I – Anticipation by Doolin

The Examiner finds that Doolin discloses an airfoil member having all the limitations of independent claims 1 and 18. Final Act. 2–3, 5. More specifically, the Examiner finds that Doolin discloses an airfoil member having “a composite core member comprising at least two adjacent cell members, each of the cell members being a hexagonal tubular structure” and “wherein each of the at least two adjacent cell members are in contact with a substantially vertical wall of [a] planar or bent planar septum and at least one of [an] upper skin and [a] lower skin,” as claimed. *Id.* (citing Doolin 2:13–17, Fig. 3). The Examiner explains that Doolin’s honeycomb cores 36 and 38 correspond to the claimed “at least two adjacent cell members . . . being a

² The Examiner includes claim 2 in the header of this rejection. Final Office Action (“Final Act.”) 2, dated Feb. 8, 2018. However, claim 2 is not discussed in the body of the rejection (*id.* at 2–6) and claim 2 has been canceled (Appeal Br. 7 (Claims App.)).

hexagonal tubular structure,” Doolin’s I-shaped web 40 corresponds to the claimed “planar or bent planar septum,” Doolin’s top skin 32 corresponds to the claimed “upper skin,” and Doolin’s bottom skin 34 corresponds to the claimed “lower skin.” *Id.*; *see also* Ans. 3–4.³

Appellant argues that “the only cells [of honeycomb cores] 36, 38 that can be considered adjacent and in contact with the septum 40 would be blocked from contacting both the upper and lower skins by the laterally extending portions of the I-beam shaped septum of Doolin.” Appeal Br. 4; *see also id.* at 5.

Appellant’s contentions are persuasive. As an initial matter, we note that claims 1 and 18 recite “each of the cell members [is] a hexagonal tubular structure” rather than “the composite core is a hexagonal structure.” Appeal Br. 7, 11 (Claims App. (emphasis added)).

Figure 3 of Doolin illustrates a composite rotor blade and is reproduced below:

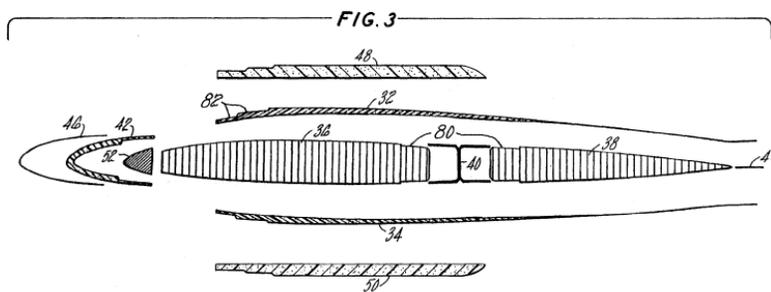


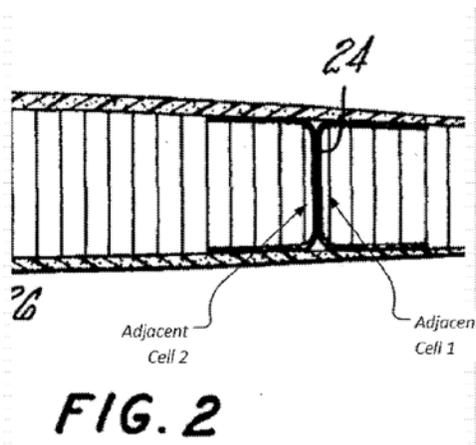
Figure 3 is an exploded view of a chordal section through Doolin’s composite rotor blade. Doolin 1:49–50.

³ Examiner’s Answer (“Ans.”), dated Oct. 5, 2018.

Doolin discloses that “[t]he blade includes top integrated spar/skin 32, and bottom integrated spar/skin 34 which taper in chord wise and spanwise directions over Nomex *honeycomb cores 36 and 38.*” *Id.* at 2:14–18 (emphasis added). Stated differently, cores 36 and 38 are honeycomb structures. As such, at best, the cells within cores 36 and 38 have a hexagonal tubular structure—rather than the overall structure of the cores themselves. Thus, the Examiner is incorrect to find that cores 36 and 38 correspond to the “at least two adjacent cell members . . . being a hexagonal tubular structure,” as claimed. *See* Final Act. 2–3, 5; Ans. 3–4.

Further, even if the Examiner correctly identifies the cell members of cores 36 and 38 as cell members having a hexagonal tubular structure, we note the following.

Figure 2 of Doolin, annotated and modified by Appellant, illustrates a composite rotor blade with identified cell members and is reproduced below:



Annotated and modified Figure 2 is a partial chordal section through Doolin’s composite rotor blade with cells labelled as “Adjacent Cell 1” and “Adjacent Cell 2.” Reply Br. 3;⁴ *see also* Doolin 1:49–50.

⁴ Reply Brief (“Reply Br.”), filed Dec. 5, 2018.

As Appellant explains,

the requirements of independent claims 1 and 18 would require the two adjacent cells, labelled “Adjacent Cell 1” and “Adjacent Cell 2” in the annotated Figure 2 of Doolin [above], are necessarily the two tubular hexagonal structures that must be examined for whether their upper and lower surface networks contact the upper and lower skins, respectively.

Reply Br. 2. Thus, in the annotated and modified Figure 2, Appellant correctly identifies labelled “Adjacent Cell 1” and “Adjacent Cell 2” as corresponding to “the at least two adjacent cell members [that] are in contact with a substantially vertical wall of the planar or bent planar septum” as claimed, in which Figure 2 shows Doolin’s web 24 corresponding to “the planar or bent planar septum.” *See* Doolin 2:1. However, these labeled “Adjacent Cell 1” and “Adjacent Cell 2” are separated by web 24 such that they are *not in contact* with Doolin’s top skin 32 or bottom skin 34. As such, even if the Examiner correctly identifies the cell members of cores 36 and 38 as cell members having a hexagonal tubular structure, Doolin does not disclose “each of the at least two adjacent cell members are in contact with a substantially vertical wall of the planar or bent planar septum *and at least one of the upper skin and the lower skin,*” as claimed (emphasis added).

Accordingly, we do not sustain the Examiner’s rejection of claims 1 and 18 and claims 3, 4, 9, 13–15, 19, and 20 depending therefrom, as anticipated by Doolin.

Rejections II – IV Obviousness over Doolin, Doolin and Hand, or Doolin and Lee

Claims 5–8, 10–12, 16, and 17 depend from claim 1. Appeal Br. 8–10 (Claims App.). The Examiner’s rejections of claim 5 as unpatentable over Doolin and Hand, of claims 6–8, 16, and 17 as unpatentable over Doolin and

Lee, and of claims 10–12 as unpatentable over Doolin, are each based on the same unsupported findings in Doolin discussed above with respect to claim 1. *See* Final Act. 6–10. The Examiner does not rely on the teachings of Hand and/or Lee in any manner that remedies the deficiencies of Doolin. Accordingly, for reasons similar to those discussed above for claim 1, we do not sustain the Examiner’s rejections of claims 5–8, 10–12, 16, and 17 as unpatentable over the various combinations of cited art.

DECISION

We REVERSE the decision of the Examiner to reject claims 1, 3, 4, 9, 13–15, and 18–20 as anticipated by Doolin.

We REVERSE the decision of the Examiner to reject claim 5 as unpatentable over Doolin and Hand.

We REVERSE the decision of the Examiner to reject claims 6–8, 16, and 17 as unpatentable over Doolin and Lee.

We REVERSE the decision of the Examiner to reject claims 10–12 as unpatentable over Doolin.

REVERSED