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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JONATHAN GILSON, ANDRE M. HALL,
OLIVER V. ATASSI, and RAMONS A. REBA

Appeal 2019-003263
Application 14/472,849
Technology Center 3700

Before CHARLES N. GREENHUT, JAMES P. CALVE, and JILL D. HILL, *Administrative Patent Judges.*

HILL, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims1–4, 6–12, 18, 20, 23, 24, and 29–41[2]. *See* Non-Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

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[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 United Technologies Corporation. Appeal Br. 1.

[2] The Examiner's Disposition of Claims in the Office Action Summary contains inconsistencies in the claim listings. It is our understanding that claims 1–4, 6–12, 18, 20, 23, 24, and 29–41 are pending. Claims 1–4, 6–12,

We AFFIRM.

BACKGROUND

Claims 1 and 21 are independent. Claim 1, reproduced below with certain limitations italicized, illustrates the claimed subject matter:

> 1. A nacelle assembly for a gas turbine engine comprising:
> a core nacelle defined about an engine centerline axis;
> a fan nacelle mounted at least partially around said core nacelle, the core nacelle and fan nacelle defining a fan bypass flow path; and
> a variable area fan nozzle in communication with said fan bypass flow path, said variable area fan nozzle having a first fan nacelle section and a second fan nacelle section downstream of said first fan nacelle section, said first fan nacelle section and said second fan nacelle section axially movable relative to one another to define an auxiliary port to vary a fan nozzle exit area and adjust fan bypass airflow, said auxiliary port defined between said first fan nacelle section and said second fan nacelle section, *said first fan nacelle section comprising a first acoustic system having a first acoustic impedance that attenuates a noise characterized by a leading edge of said second fan nacelle section, said second fan nacelle section comprising a second acoustic system having a second acoustic impedance that attenuates a noise characterized by said leading edge of said second fan nacelle section, and a radially outer surface of said second acoustic system defining said auxiliary port*.

18, 20, 23, 24, and 29, 30, 35–39, and 41 are rejected. See Final Act. 5, 9; Appeal Br. 8–12 (Claims App.). Claims 31–34 and 40 are objected to. *Id*.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Schiel	3,598,318	Aug. 10, 1971
Clark	3,820,719	June 28, 1974
Reba	US 2008/0295518 A1	Dec. 4, 2008
Gilson '488	US 2009/0320488 A1	Dec. 31, 2009
Gilson '088	US 8,820,088 B2	Sep. 2, 2014

REJECTION

I. Claims 1–4, 6–12, 18, 20, 23, 24, and 29–41 stand rejected on the ground of non-statutory double patenting as unpatentable over claims 1–20 of Gilson '088 in view of Gilson '488. Final Act. 5.

II. Claims 1, 2, 6–8, 18, 20, 23, 24, 29, 30, 35, 38, and 39 stand rejected under 35 U.S.C. § 103 as unpatentable over Gilson '488, Clark, and Schiel. Final Act. 5.

III. Claims 3, 4, 9–12, 36, 37, and 41 stand rejected under 35 U.S.C. § 103 as unpatentable over Gilson '488, Clark, Schiel, and Reba. Final Act. 9.

ANALYSIS

Rejection I – Double Patenting

The Examiner finds that Gilson '488 "discloses most of the limitations of the instant application except a radially outer surface of said second acoustic system defining said auxiliary port," and that it would have been obvious "to include a radially outer surface of said second acoustic system defining said auxiliary port in [Gilson '488] to attenuate the leading edge noise to reduce the total effective perceived noise level." Final Act. 5 (emphasis omitted) (citing Gilson '488 ¶ 30).

Appellant does not refute this rejection. Appeal Br. 6. Therefore, we summarily sustain the rejection.

Rejection II – Obviousness

The Examiner finds, *inter alia*, that Gilson '488 discloses a nacelle assembly for a gas turbine engine, the nacelle assembly comprising a "variable area fan nozzle 42 having a first fan nacelle section 52 and a second fan nacelle section 54 downstream of said first fan nacelle section 52," and axially movable with respect to the first nacelle section 52 "to define an auxiliary port 60 [therebetween] to vary a fan nozzle exit area 44 and adjust fan bypass airflow [B], said auxiliary port 60." Final Act. 6. The Examiner also finds that Gilson's second fan nacelle section 54 comprises "a second acoustic system 64 . . . having a second acoustic impedance . . . configured to attenuate a noise characterized by a leading edge of said second fan nacelle section 54 . . . a radially outer surface 68 of said second acoustic system 64 defining said auxiliary port 60." *Id*. (citing Gilson '488 Figs. 4–6 and ¶ 30). The Examiner finds that Gilson '488 does not disclose a first fan nacelle section having an acoustic system. *Id.*

The Examiner, however, finds a first fan nacelle section with an acoustic system in Clark, which discloses a first fan nacelle section 27 comprising a first acoustic system 28 and a second fan nacelle section 25 comprising a second acoustic system 32, and a port defined therebetween. *Id.* (citing Clark Fig. 2). The Examiner also finds that Schiel discloses a nozzle exit "having an acoustic system 70 extending axially through the entire nacelle including an acoustic system extending from a trailing edge of a first fan nacelle section [fwd sleeve 12] between the exit nozzle 14 and an opening 56." *Id.* at 7 (citing Schiel Fig. 6; 2:54–59).

The Examiner concludes that it would have been obvious to modify Gilson '488 by adding an acoustic system to the first fan nacelle section "as described by Clark and Schiel . . . so that the system extends axially from a trailing edge of said first fan nacelle section . . . to improve attenuation of noise by increasing the acoustically treated area." *Id*. (citing Schiel 1:45–48). The Examiner further notes that, because "the combination of Gilson ['488], Clark and Schiel teaches all the structural limitations of the claim, the combination would be capable of performing the functional language of *attenuating a noise characterized by a leading edge of said second fan nacelle section*." *Id*.

Claims 1, 6–8, 18, 20, 24, 29, 30, 35, 38, and 39

Appellant argues claims 1, 6–8, 18, 20, 24, 29, 30, 35, 38, and 39 as a group. We select independent claim 1 as representative. Claims 6–8, 18, 20, 24, 29, 30, 35, 38, and 39 stand or fall with claim 1.

Appellant argues that prima facie obviousness has not been established because the Examiner's reasoning lacks a rational basis for the following reasons: (1) the Examiner provides no evidence that Schiel "was concerned with attenuating leading edge noise of the fan cowl portion 14 with [its] acoustically treated surfaces 70 along the fan cowling 12"; and (2) Schiel's acoustically treated surfaces 70 "do not extend along radially outer surfaces of the fan cowl portion 14 or face towards fan cowling 12," such that a skilled artisan "would not have been motivated to turn to Schiel to attenuate noise along nacelle section 54 of Gilson ['488]." Appeal Br. 4. Appellant further argues that "the Examiner does not point to any objective evidence that Schiel is concerned with the alleged teachings of Clark." *Id.* at 5.

Regarding the prior art not specifically disclosing using the first acoustic system to attenuate a noise characterized by the leading edge, the Examiner responds that Appellant recognizing and claiming "another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious." Ans. 5. The Examiner further responds that attenuation of leading edge noise was asserted to have been taught by the proposed combination of Gilson '488, Clark, and Schiel, rather than by any one reference. *Id*. That is, when the structure of the references is combined, leading edge noise will be attenuated by the resulting structure.

The Examiner has the better argument. First, Gilson '488 includes first and second fan nacelle sections 52, 54 that are separated to vary the fan nozzle area and create an auxiliary port 60 therebetween. *See* Gilson '488, Figs 1A and 2B, ¶ 27. Gilson '488 is concerned with acoustic impedance, and specifically *attenuating leading edge noise* in its variable area fan nozzle. *Id.* Abstract, ¶ 1. Gilson '488 appreciates that providing a leading edge region 62 of its second fan nacelle section 54 with an acoustic system 64 provides desires acoustic impedance and attenuate leading edge noise. *Id.* at ¶¶ 30–31. The second acoustic system 64 of the second nacelle section 54 of Gilson '488 is shown to include "a radially outer surface of said second acoustic system [64 that defines] said auxiliary port" as recited in claim 1. The currently claimed invention takes noise attenuation a step further by additionally providing (and claiming) an acoustic systems at a trailing edge of the first fan nacelle section 52. The Examiner turns to the combination of Clark and Schiel for this additional claimed subject matter.

Clark disclose a variable area fan nozzle with a first nacelle section 24 and a second nacelle section 20, each section having an inner surface 26, 28 with "sound absorbing material 32" thereon. *Id.* 2:17–52. Sound absorbing material 32 is provided on the trailing edge of the first nacelle and the leading edge of the second nacelle (as claimed) so it's clear that any air passing over the leading edge of the second nacelle passes by the sound absorbing material 32 on the first and second nacelles of Clark. *Id.* Thus, a skilled artisan would understand that Clark appreciates that providing sound absorbing material on both the first and second nacelle sections impedes noise in its variable area fan nozzle. We are not persuaded that Clark's failure to appreciate or expressly state that the attenuated noise includes leading edge noise from its second fan nacelle section, causes the Examiner's reasoning to lack a rational basis. Further, we are not persuaded that the existence of a seal 33 in Clark negates that its first nacelle section 24 has a second acoustic system (i.e., sound absorbing material 32 on an inner surface thereof).

Schiel also discloses a variable area fan nozzle having first and second nacelle sections 18, 20. *See* Schiel 2:7–11. Schiel acknowledges that noise level is a problem, and that lining the nozzle "wetted area" with acoustic materials to suppress noise is known. *Id.* 1:20–27. Schiel is concerned with increasing/improving sound attenuation by "increasing the acoustically treated area" with "longitudinally aligned foil means having acoustic surfaces which form portions of the wall of the exhaust passageway." *Id.* 1:34–60. Schiel uses acoustically treated surfaces 70 (outer wall of passageway), 72 (center body on other side of passageway), and exterior surfaces of sections 76 and 78 of the bypass flow foil 30 "for markedly

increasing nozzle wetted area which can be used for sound attenuation." *See Id.* 2:54–75, 3:74–4:3. Schiel can be fairly characterized as proposing using acoustic material throughout the exhaust region of the bypass path to attenuate noise of air passing through that region to include passing by a leading edge of a second nacelle.

The Examiner reasons that the proposed combination would improve noise attenuation by increasing the acoustically treated area, which is supported by the teachings of Clark and Schiel. The Examiner determines that the resulting structure would be "capable of" attenuating noise from a leading edge of the second fan nacelle section (Final Act. 7), which appears to be a reasonable determination in view of the fact that these teachings render obvious the claimed first and second acoustic impedance structures, and Appellant has not alleged that the combined structure would *not* be capable of such leading edge noise attenuation.

Appellant also appears to argue that the combined reference fail to disclose the claimed "radially outer surface of said second acoustic system defining said auxiliary port" because Schiel does not teach this feature. *See* Appeal Br. 5. This argument is not persuasive, because the Examiner relies on Gilson '488 to teach this feature as radially outward surface 68 of second acoustic system 64 in Figures 4–6 (Final Act. 6) and second acoustic system of Gilson '488 teaches leading edge sections 62, 68 of second nacelle section 54 with acoustic impedance on a radially outer surface defining an auxiliary port as claimed. *See* Gilson '488 ¶ 30, Figs. 3–6.

Claims 2 and 23

Regarding dependent claims 2 and 23, Appellant argues that the Examiner erred in finding that Clark's sound absorbing material 32 extends

from a trailing edge of a first fan nacelle section, because "inflatable seal 33 in Figure 2 of Clark appears to space apart the sound absorbing material 32 from what the Examiner appears to interpret to be a trailing edge of the alleged first fan nacelle section." Appeal Br. 4.

The Examiner responds that Gilson '488 discloses the first and second nozzle sections without a seal, and "it is unclear why the combination would necessitate the addition of the seal of Clark." Ans. 6. The Examiner further argues that "there is no evidence that [Clark's] inflatable seal 33 is annular" or spaces apart its "sound absorbing material through the entire circumference." *Id*. The Examiner contends that "it *appears* the seal is located at discrete circumferential positions, while the sound absorbing material could extend all the way to the trailing edge in other circumferential positions." *Id*.

Although we do not necessarily agree with the Examiner's determination that Clark's seal appears to be located at discrete circumferential positions, we are not persuaded by Appellant's argument, because claims 2 and 23 recite that the "first acoustic system extends axially from a trailing edge of said first fan nacelle section," without requiring that such acoustic system is continuous or uninterrupted. In our view, the claimed extension to the trailing edge does not require uninterrupted acoustic material over the entire surface of the first fan nacelle section.

Conclusion

For the above reasons, we sustain Rejection II.

Rejection III – Obviousness

Claims 3, 4, 9, and 10

Appellant makes no argument that claims 9 and 10 are patentable over Gilson '488, Clark, Schiel, and Reba, if claim 1 is not patentable over Gilson '488, Clark, and Schiel.

Claim 3 depends indirectly from claim 1 and recites the first acoustic system comprising "a perforated sheet formed on an inner surface of said bulk cartridge." Claim 4 depends from claim 3 and recites that the "perforated sheet further comprises a deformable material."

Appellant relies on the arguments made regarding Rejection II, and further argues that the references fail to teach a first acoustic system comprising a "perforated sheet formed on an inner surface of said bulk cartridge" because, while Gilson '488 discloses a second acoustic system comprising such a perforated sheet, it does not disclose a first acoustic system and therefore cannot disclose a first acoustic system comprising the claims perforated sheet. Appeal Br. 6.

The Examiner responds that the combination of Gilson '488, Clark, and Schiel "teaches the first acoustic system," and Gilson '488 discloses the sound attenuating benefits of "using a perforated sheet with deformable material." Final Act. 9, Ans. 7.

Appellant replies that "[t]he Examiner does not point to any objective evidence that it would have been obvious to have incorporated a perforated sheet into a first acoustic system in view of Gilson," making the rejection conclusory. Reply Br. 4. We disagree. As explained above, the combination of Gilson '488, Clark, and Schiel indeed teach the first acoustic system. Further, Appellant does not refute that Gilson '488 discloses the sound attenuating benefits of "using a perforated sheet with deformable material." Given that Gilson '488 already uses a perforated sheet with

deformable material for its second acoustic system, we agree with the Examiner that a skilled artisan would also understand that, if an acoustic system is added to the first fan nacelle section of Gilson '488, it is reasonable to make the second acoustic system from the same perforated sheet with deformable material.

Claims 11 and 12

Claim 11 recites the bulk cartridge of the first acoustic system comprising "a bulk acoustic absorbing material," and claim 11 recites the bulk absorbing material being "selected from a group consisting of sintered metal, ceramic foam, aramid fiber, carbide material and composite."

Appellant argues that the Examiner "does not allege or point to any objective evidence establish that Reba discloses" the features of dependent claims 11 and 12. Appeal Br. 6.

The Examiner responds that Gilson '488, rather than Reba, is relied on for disclosing "using a sintered metal, ceramic foam or carbide material for the bulk absorbing material." Final Act. 7; Ans. 7 (citing Gilson '488, ¶ 32). We discern no error in the Examiner's findings.

Claims 36, 37, and 41

Appellant makes no argument that claims 36, 37, and 41 are patentable over over Gilson '488, Clark, Schiel, and Reba, if independent claim 20 is not patentable over Gilson '488, Clark, and Schiel.

Conclusion

For the above reasons, we sustain Rejection III.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1–4, 6–12, 18, 20, 23, 24, 29–41		Provisional non-statutory double patenting	1–4, 6–12, 18, 20, 23, 24, 29–41	
1, 2, 6–8, 18, 20, 23, 24, 29, 30, 35, 38, 39	103	Gilson ’488, Clark, Schiel	1, 2, 6–8, 18, 20, 23, 24, 29, 30, 35, 38, 39	
3, 4, 9–12, 36, 37, 41	103	Gilson ’488, Clark, Schiel, Reba	3, 4, 9–12, 36, 37, 41	
Overall Outcome			1–4, 6–12, 18, 20, 23, 24, 29–41	

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