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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TORENCE P. BROGAN, JEFFERY A. LOVETT, CHRISTOPHER A. ECKETT, and MAY L. CORN

Appeal 2019-002072
Application 13/936,836
Technology Center 3700

Before JENNIFER D. BAHR, MICHAEL J. FITZPATRICK, and JILL D. HILL, *Administrative Patent Judges*.

FITZPATRICK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant, United Technologies Corporation,[1] appeals under 35 U.S.C. § 134(a) from the Examiner's final decision rejecting claims 1–4, 8–10, 14, 16, 17, and 21–23. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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[1] Appellant is the "applicant" as provided for in 37 C.F.R. § 1.42(b). Appellant identifies itself as the sole real party in interest. Appeal Br. 3.

STATEMENT OF THE CASE

The Specification

The Specification's disclosure "relates generally to a turbine engine and, in particular, to a turbine engine fuel delivery system with one or more fuel injectors." Spec. ¶2.

The Claims

Claims 1–4, 8–10, 14, 16, 17, and 21–23 are rejected. Final Act. 1. The only other pending claims, namely claims 5–7, 11–13, and 15, have been withdrawn from consideration. *Id.* Claims 1, 16, and 21 are independent. Claim 16 is illustrative and reproduced below with emphasis added.

> 16. A fuel injection system for a gas turbine engine, comprising:
>
> a gas path wall comprising a wall aperture extending therethrough;
>
> a nozzle block comprising a nozzle aperture with a first cross sectional area, the nozzle aperture extending axially along a centerline through the nozzle block; and
>
> a cavity block that extends axially along the centerline between and axially engages the gas path wall and the nozzle block, and the cavity block comprises a cavity with a second cross sectional area that is greater than the first cross sectional area, wherein *a surface of the cavity block contacts a surface of the nozzle block, and wherein the surface of the cavity block and the surface of the nozzle block are not parallel with the centerline*;
>
> wherein the nozzle aperture injects fuel, received from a fuel delivery conduit, through the cavity and the wall aperture.

Appeal Br. 20 (emphasis added).

The Examiner's Rejections

The rejections before us are:

1. claims 16, 17, 21, and 22 under 35 U.S.C. § 102(b) (pre-AIA) as anticipated by Hibbins[2] (Final Act. 3); and

2. claims 1–4, 8–10, 14, and 23 under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Hibbins and Davis[3] (*id.* at 6).

DISCUSSION

Rejection 1—Anticipation

The Examiner found that Hibbins discloses all of the limitations of claims 16, 17, 21, and 22. Final Act. 4–6.

Appellant argues that Hibbins does not disclose "a surface of the cavity block contacts a surface of the nozzle block, and wherein the surface of the cavity block and the surface of the nozzle block are not parallel with the centerline;" as recited in independent claim 16, or "a surface of the cavity block axially engages a surface of the nozzle block, and wherein the surface of the cavity block and the surface of the nozzle block are perpendicular to the centerline," as similarly recited in independent claim 21. Appeal Br. 11 (regarding claim 16), 15 (regarding claim 21).

Figure 1 of Hibbins is reproduced below.

[2] US 3,777,983, issued Dec. 11, 1973 ("Hibbins").
[3] US 4,305,255, issued Dec. 15, 1981 ("Davis").

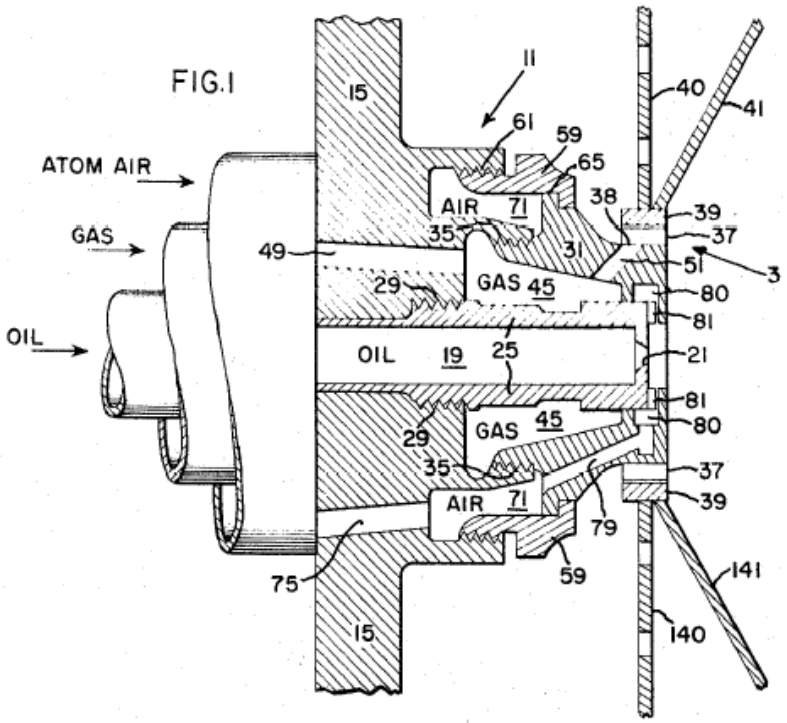

Figure 1 of Hibbins, reproduced above, shows "an elevation view, partially in cross section, of a dual fuel, air-atomized nozzle with a swirler cap." Hibbins 2:14–16.

With respect to the disputed limitations, the Examiner points to where the structures designated by reference numeral 81 and the asserted nozzle block (i.e., casing 25) meet. *See* Final Act. 4–5 (providing annotated Hibbins Figure 1 and citing it to support the finding with respect to claim 16); *see also id.* at 6 (same finding with respect to claim 21). Critical to the rejection is the Examiner's finding that the structures designated by reference numeral 81, which Hibbins describes as "circumferentially arranged slots or openings" (*see* Hibbins 3:6–7), are part of the asserted cavity block (i.e., air swirler nozzle cap 31) and not part of the asserted nozzle block (i.e., casing 25).

Appellant argues that, in Hibbins, slots/openings 81 are part of the asserted nozzle block (i.e., casing 25) and not part of the asserted cavity

block (i.e., air swirler nozzle cap 31). Appeal Br. 11. Appellant further points out that Figure 1 shows a gap between slots/openings 81 and the air swirler nozzle cap 31. *Id.* at 11.

Both the Examiner and Appellant interpret the following excerpt from Hibbins as supporting their competing findings/positions:

> Atomizing air is delivered to the nozzle face through a plurality of air passages 79 (only one shown) into a distribution ring 80. The distribution ring 80 is an annulus adjacent the nozzle casing which feeds atomizing air to circumferentially arranged slots or openings 81 in the face of the casing 25 to distribute atomizing air to the fuel emanating from the fuel nozzle.

Hibbins 3:2–8.

The Examiner finds that, from this excerpt, "it follows that . . . atomized air is fed from the openings [81] to the face (i.e., end) of the casing 25," and Hibbins, "[t]herefore, impl[ies] that the openings 81 are *not* part of the casing 25, but part of the nozzle cap 31 and adjacent the casing 25." Final Act. 2. In the Answer, the Examiner further states that "one of ordinary skill would not equate '[openings] in the face of the casing' to openings that are *part* of the casing" because "[a] ***face*** of a casing is equivalent to a ***boundary*** end of the casing." Ans. 3 (first alteration in original) (citing https://en.wikipedia.org/wiki/Face_(geometry)). Thus, according to the Examiner, "a correct reading of the prior art suggests that the face is the boundary of the casing 25 and the openings/slots are just located in the face of the casing 25 and part of the cap 31." *Id.*

Appellant argues that since the slots/openings are explicitly described as "in the face of the casing 25" (Hibbins 3:7), they are part of the casing. Appeal Br. 13; *see also* Reply Br. 2 (arguing that "a boundary of an object is formed by the object itself and, thus, is part of the object").

We are persuaded by Appellant that the Examiner has not shown that the slots/openings are part of the air swirler cap. First, Hibbins does not describe them merely as openings. Hibbins describes them alternatively as "slots" (Hibbins 3:6), thereby implying that the slots/openings have a length or depth and are akin, for example, to a channel and not merely the mouth of a channel. Second, Hibbins illustrates the slots/openings as having lengths or depths in a radial direction. *Id.* at Fig. 1 (ref. 81). Notably, the lead lines for both of the slots/openings 81 that are illustrated in Figure 1 terminate in central portions of the slots/openings. If the Examiner's interpretation of Hibbins were correct, one would expect the lead lines to terminate at one of the boundary lines of the slots/openings 81.

Additionally, Appellant is correct that Figure 1 appears to show a gap between each of the illustrated slots/openings and the air swirler cap. In other words, Hibbins does not explicitly disclose that any surface of slots/openings (part of the casing as argued by Appellant) contacts or engages a surface of the air swirler cap.

For the foregoing reasons, we reverse the rejection of claims 16 and 21. For the same reasons, we likewise reverse the rejection of claims 17 and 22, which respectively depend from claim 16 and 21 and thus incorporate by reference the limitations the Examiner has not shown Hibbins discloses. *See* 35 U.S.C. § 112 ¶4 (pre-AIA) ("A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers."); *see also* 35 U.S.C. § 112(d) (same).

Rejection 2—Obviousness

The Examiner rejected claims 1–4, 8–10, 14, and 23 as unpatentable over Hibbins in view of Davis. Final Act. 6–8.

Similar to claims 16 and 21, claim 1 recites "a surface of the cavity block longitudinally contacting a surface of the nozzle block along the longitudinal centerline, wherein the surface of the cavity block and the surface of the nozzle are perpendicular to the longitudinal centerline." Appeal Br. 18. To meet this limitation, the Examiner relies exclusively on Hibbins in the same deficient manner as with respect to the corresponding limitations of independent claims 16 and 21. Final Act. 7. Further, the Examiner does not apply Davis in a manner that could cure the deficiency. *Id.* at 8 (applying Davis exclusively for a different limitation of claim 1).

Accordingly, for similar reasons as set forth *supra*, we reverse the rejection of claim 1. And we likewise reverse the rejection of claims 2–4, 8–10, 14, and 23, which ultimately depend from either claim 1 or claim 21. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) ("Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.").

SUMMARY

Claims Rejected	**35 U.S.C. §**	**Basis**	**Affirmed**	**Reversed**
16, 17, 21, 22	102(b)	Hibbins		16, 17, 21, 22
1–4, 8–10, 14, 23	103(a)	Hibbins, Davis		1–4, 8–10, 14, 23
Overall Outcome				1–4, 8–10, 14, 16, 17, 21–23

REVERSED