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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SAN QUACH, CHRISTOPHER KING, and
TRACY A. PROPHETER-HINCKLEY

Appeal 2018-005421
Application 14/949,047
Technology Center 3700

Before JOHN C. KERINS, ERIC C. JESCHKE, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

MARSCHALL, *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, 5–8, 10–13, 15–17, and 19–21.² We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ The term “Appellant” is used herein to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies United Technologies Corp., as the real party in interest. Appeal Br. 1. Appellant subsequently filed, on April 23, 2020, a “Real Party-In-Interest Notice Pursuant to 37 C.F.R. § 41.8,” advising that United Technologies Corporation changed its name to Raytheon Technologies Corporation on April 3, 2020.

² Claims 4, 9, 14, and 18 are withdrawn. Final Act. 1.

CLAIMED SUBJECT MATTER

The invention relates to cooling passages for a gas turbine engine component. Spec. 1 (Title). Claims 1 and 11 are independent, and claim 1 is reproduced below:

1. A gas turbine engine component comprising:
 - a wall having an inner surface and an outer surface; and
 - at least one non-rectangular slot defined by the outer surface and in communication with a slot passage comprising:
 - an inlet portion extending through the wall from an inlet defined by the inner surface to an intermediate portion; and
 - an outlet portion extending through the wall from the intermediate portion to the at least one non-rectangular slot, wherein the intermediate portion extending through the wall and fluidly connecting the inlet portion and the outlet portion.

Appeal Br. 5 (Claims App.).

REJECTION ON APPEAL³

Appellant appeals from the Examiner's rejection of claims 1–3, 5–8, 10–13, 15–17, and 19–21 under 35 U.S.C. § 102(e) as anticipated by Gregg.⁴

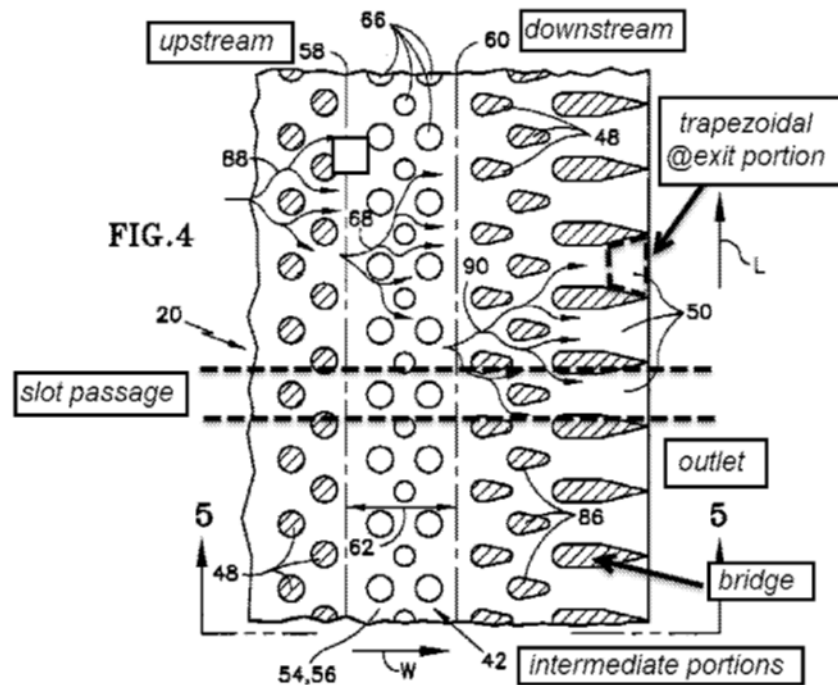
ANALYSIS

Appellant's arguments focus on the limitation in independent claims 1 and 11 requiring "at least one non-rectangular slot defined by the outer

³ The Examiner's rejection pursuant to 35 U.S.C. § 112, second paragraph was withdrawn in the Answer. *See* Final Act. 3; Ans. 2 (withdrawing rejection in light of entry of claim amendments); Adv. Act. 1 (mailed Oct. 19, 2017) (entering proposed amendments).

⁴ US 2005/0135933 A1, published June 23, 2005 ("Gregg").

surface.” Appeal Br. 3–4, 5–6 (Claims App.). The Examiner finds that Gregg discloses “at least one non-rectangular slot (slot 50 being non-rectangular in Fig 4) defined by the outer surface (slot 50 defined by the outer surface 36 in Fig 3) and in communication with a slot passage (slot passage connecting cavity 40 to slot 50 in Fig 3).” Final Act. 3. The Examiner further finds that the “non-rectangular slot 50 is extending to the outer surface 36 and having an exit or outlet on the outer surface 36, interpreted as defined by the outer surface.” *Id.* at 2. As to the non-rectangular requirement, the Examiner finds that “slot 50 [has] a non-rectangular cross-section view in Fig 3 and a trapezoidal view in Fig 4.” Adv. Act. 2. The Examiner relies on an annotated version of Gregg’s Figure 4, reproduced below.



Annotated Figure 4 depicts where the Examiner identifies “trapezoidal” slot 50 at an “exit portion.” Final Act 5.

Appellant argues that Gregg does not expressly or inherently disclose a slot with a non-rectangular shape because none of Gregg’s figures show the outer surface of the airfoil. Appeal Br. 3. According to Appellant, “Figure 3 only shows one dimension of the port 50 at the outer surface through a radial plane cross section and Figure 4 only shows one dimension of the port 50 at the outer surface through a plane cross section extending through port 50 in a radial direction.” *Id.* Appellant contends that in Figure 4 “the outer surface of the airfoil is not shown and the intersection of the port 50 and the outer surface is shown by a single line.” *Id.*

In the Answer, the Examiner construes “non-rectangular slot . . . as an opening that is not rectangular and that is in communication with a path.” Ans. 3. The Examiner finds that Gregg’s slot 50 has a trapezoidal shape in communication with a slot passage connecting slot 50 to cavity 40. *Id.* at 3–4. The Examiner further finds that the claims do not require a non-rectangular shape in more than one view, and that at least one view from Gregg shows the non-rectangular shape of slot 50. *Id.* at 5. The Examiner also finds that the claim language “does not require . . . the outlet at the outer surface to be non-rectangular,” and that Gregg discloses slot 50 as non-rectangular “immediately adjacent the outer surface 36, i.e., defined by the outer surface.” *Id.* at 6.

In its Reply,⁵ Appellant argues that the trapezoidal shape the Examiner relies upon appears within the same structure the Examiner refers

⁵ Appellant’s arguments in its Reply Brief go well beyond the limited arguments in its Appeal Brief. *Compare* Appeal Br. 4–5, *with* Reply Br. 1–5. These arguments are arguably waived because they could have been raised in the Appeal Brief (*see* 37 C.F.R. § 41.41(b)(2)), but we exercise our discretion to address them despite any waiver.

to as the “outlet portion” and does not include structure defined by the outer surface as required by the claims. Reply Br. 3–4. Appellant also argues that the trapezoidal area “identified by the Examiner is not defined by the outer surface because the portion is internal to the airfoil 20 and includes an opening through an outer surface of the airfoil.” *Id.* at 5.

The central issue on appeal turns on whether the claimed “non-rectangular slot defined by the outer surface” can include slots having structure adjacent to the exterior of the outer surface that defines the shape of the slot, as the Examiner found. The Examiner finds that the limitation “does not require . . . the outlet at the outer surface to be non-rectangular,” and relies on structure “immediately adjacent the outer surface,” while Appellant argues that any such “internal” structure is not defined by the outer surface. Ans. 6; Reply Br. 5. Based on our review of the claim language in light of the Specification, we construe “non-rectangular slot defined by the outer surface” as broad enough to include structure that defines the shape of the slot immediately adjacent to the outer surface, as the Examiner did here. The Specification does not support Appellant’s view that only structure viewed from the outside of the airfoil can be used to define the shape of the slot, and that structure immediately adjacent to and inside the outermost surface cannot be relied upon when determining that shape. To the contrary, the only figure showing the purported non-rectangular slot from the exterior of the airfoil, Figure 2, depicts *rectangular* slots 84. Spec. ¶ 45; Fig. 2. Accordingly, we must consult other figures in the Specification showing the area adjacent to the outer surface to determine how the slot(s) can be construed as being non-rectangular in nature. Figures 4 and 5, for example, show slots 84, 84A in cross-section, with the angled

walls defining slots with a trapezoidal shape. *Id.* at Figs. 4–5. Accordingly, the Specification depicts the claimed slots with a depth that defines a non-rectangular shape, supporting a construction of “non-rectangular slot defined by the outer surface” as including slots having structure adjacent to the exterior of the outer surface that defines the shape of the slot.

Gregg’s Figure 4 depicts a number of ports 50 disposed along an edge of airfoil 20 and providing an air exit from airfoil 20. Gregg ¶ 25, Fig. 4. Ports 50 are defined in part by trailing edge pedestals 100 between each port 50. *Id.* ¶ 34, Fig. 4. The Examiner relies on the trapezoidal shaped ports 50 (the claimed “slot”) created by the tapered portion of trailing edge pedestals 100 as they reach pressure side wall 36 (the claimed “outer surface”). Final Act. 3, 5; Ans. 3–4. Gregg’s trapezoidal shaped slots are therefore formed by structure immediately adjacent to and that extends to the outer surface of airfoil 20. *See id.* As discussed above, the Specification supports Examiner’s reliance on the structure immediately adjacent the outer surface that defines the shape of the slots. Appellant does not argue that Gregg fails to disclose the claimed slots if the structure immediately adjacent to the outer surface can be considered when determining whether the slot is “non-rectangular.” We discern no error in the Examiner’s finding that Gregg discloses trapezoidal slots that meet the claim limitation requiring “non-rectangular slot defined by the outer surface.”

Although Appellant’s arguments are largely premised on the assumption that the claimed slots cannot include any structure immediately adjacent to the outer surface, Appellant also takes issue with the Examiner’s construction of the slot as “an opening that is not rectangular and that is in communication with a path.” *See Reply Br.* 3–5. We need not reach

whether that construction accurately captures the claim requirements given our agreement with the Examiner that the claim covers slots defined by structures that are immediately adjacent the outer surface that form a non-rectangular slot. Appellant does not argue that Gregg fails to disclose any other limitations of the claims on appeal.

As to Appellant's argument that the Examiner erred by relying on structure defining the trapezoidal slot as "within the portion identified as the claimed 'outlet portion,'" we see no inconsistency in the Examiner's findings. *See* Reply Br. 3; Final Act. 3–4. The claims require an outlet portion extending from the intermediate portion to the slot. Appeal Br. 5–6 (Claims. App.). The Examiner's reliance on an outlet portion of Gregg downstream of its "intermediate portion" is consistent with Gregg's Figure 4, which depicts a structure between intermediate portion 42 and the trapezoidal shaped ports 50. *See* Final Act. 3–4; Gregg, Fig. 4. The Specification discloses a very similar arrangement, with slots 84, 84A depicted as adjacent to and overlapping with outlet portion 100. *See* Spec. ¶ 49, Figs. 4–5. The Specification does not consistently describe outlet portion 100 as distinct from or overlapping with the slot, but the high degree of similarity between the claimed arrangement, when viewed in light of the Specification, and Gregg's structure, shows that both structures include the claimed slot and an outlet portion extending from the intermediate portion to the slot. *See* Spec. ¶¶ 49 (describing outlet portion 100 as connecting intermediate portion 98 and slot 84), 51 (describing outlet portion 100 as part of slot 84A), Figs. 4–5; Gregg, Fig. 4. Whether the outlet portion and slot are viewed as adjacent to one another or overlapping, both the Specification and Gregg show an outlet portion extending between an

intermediate portion and the slot as required by the claims. *See id.* We discern no error in the Examiner's finding that Gregg discloses the claimed slot, even if it forms a portion of the outlet portion of Gregg.

Based on the foregoing, we sustain the rejection of independent claims 1 and 11. Appellant does not argue that Gregg fails to disclose any of the limitations of dependent claims 2, 3, 5–8, 10, 12, 13, and 15–17, and we therefore sustain the rejection of those claims for the same reasons.

DECISION

We affirm the Examiner's rejection of claims 1–3, 5–8, 10–13, 15–17, and 19–21 as anticipated by Gregg.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–3, 5–8, 10–13, 15– 17, 19–21	102(e)	Gregg	1–3, 5–8, 10–13, 15–17, 19–21	
Overall Outcome			1–3, 5–8, 10–13, 15–17, 19–21	

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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED