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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SASHA M. MOORE, THOMAS N. SLAVENS,
NICHOLAS M. LORICCO, and TIMOTHY J. JENNINGS

Appeal 2020-001349
Application 16/100,257
Technology Center 3700

Before DANIEL S. SONG, STEFAN STAICOVICI, and
MICHELLE R. OSINSKI, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's decision in the Final Office Action (dated May 22, 2019, hereinafter "Final Act.") rejecting claims 1–13. We have jurisdiction over this appeal 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. United Technologies Corporation is identified as the real party in interest in Appellant's Appeal Brief (filed Sept. 25, 2019, hereinafter "Appeal Br."). Appeal Br. 1.

SUMMARY OF DECISION

We AFFIRM IN PART.

INVENTION

Appellant's invention relates to forming an engine component by flowing machining fluid through a pre-formed internal passageway to change its pre-formed dimension. Spec. para. 4.

Claims 1 and 13 are independent. Claim 1 is illustrative of the claimed invention and reads as follows:

> 1. A method of forming an engine component, comprising:
>
> forming an engine component having an internal passageway, the internal passageway formed with an initial dimension; and
>
> establishing a flow of machining fluid within the internal passageway in a same direction as an expected direction of a flow of cooling fluid within the internal passageway during operation of an engine, the machining fluid changing the initial dimension.

REJECTIONS

I. The Examiner rejects claims 1–5, 8, and 10–13 under 35 U.S.C. § 102(a)(1) as being anticipated by Kildea.[2]

II. The Examiner rejects claim 9 under 35 U.S.C. § 103 as being unpatentable over Kildea.

III. The Examiner rejects claims 2–4, 6, and 7 under 35 U.S.C. § 103 as being unpatentable over Konter[3] and Kildea.

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[2] Kildea, US 5,247,766, issued Sept. 28, 1993.
[3] Konter et al., US 2009/0041587 A1, published Feb. 12, 2009.

ANALYSIS

Rejection I

Claims 1–5, 8, 10, and 11

Appellant does not argue the patentability of claims 2–5, 8, 10, and 11 apart from claim 1. *See* Appeal Br. 4–5. Thus, in accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 1 as the representative claim to decide the appeal of the rejection of these claims, with claims 2–5, 8, 10, and 11 standing or falling with claim 1.

The Examiner finds Kildea discloses, *inter alia*, a method for forming an engine component 2 with internal passageways 4, 5 having an initial dimension and introducing pressurized air with abrasive grit 9 into passageways 5 to modify, i.e., enlarge, the initial dimension of passageways 5 to a desired final dimension. Final Act. 2 (citing Kildea, col. 1, ll. 27–42, 54–65, col. 1, l. 66–col. 2, l. 23, Figure). The Examiner further finds that because in Kildea the pressurized air with abrasive grit 9 exits passageways 5, i.e., cooling holes, Kildea discloses machining fluid flowing in the same direction as cooling fluid would flow during operation of engine component 2, as called for by claim 1. *Id.* at 3 (citing Kildea, col. 2, ll. 1–15).

Appellant argues that the claimed "term 'establishing' is used in the present disclosure to mean introducing." Appeal Br. 4. Thus, according to Appellant, because Kildea's machining fluid, i.e., pressurized air with abrasive grit 9, is introduced into cooling hole 6, "Kildea establishes its flow of grit fluid in a direction *opposite* the direction of the expected direction of cooling flow." *Id.*

We are not persuaded by Appellant's arguments because the Examiner is correct that claim 1 does not require that "*every* internal

passageway in Kildea have machining fluid flowing in the proper direction," i.e., the same direction as cooling fluid would flow during operation of an engine component. Examiner's Answer (dated Oct. 25, 2019, hereinafter "Ans.") 8 (emphasis added). Limitations not appearing in the claims cannot be relied upon for patentability. *In re Self*, 671 F.2d 1344, 1348 (CCPA 1982). Here, we agree with the Examiner that "[t]he moment machining fluid flows out through exit passage (5) of Kildea (which is the proper direction) and changes its dimensions . . . the claim limitation is met." *Id.*

Furthermore, the recited "internal passageway" of claim 1, which has machining fluid flowing in the same direction as cooling fluid would flow during operation of an engine component, requires an initial dimension changed by the flow of machining fluid. *See* Appeal Br. 8 (Claims App.). As the dimension of Kildea's hole 6 is not changed by the flow of pressurized air and grit 9, i.e., machining fluid, hole 6 does not constitute "an internal passageway," as called for by independent claim 1. *See* Kildea, col. 2, ll. 38–40 (As grit 9 is introduced at a low velocity into hole 6 it will not have a detrimental effect on the dimension of hole 6). However, as the Examiner correctly finds, cooling hole 5, which is enlarged by the flow of pressurized air and grit 9, constitutes "an internal passageway," as called for by claim 1. *See* Ans. 8; *see also* Kildea, col. 2, ll. 10–14 (Grit 9 from chamber 4 is accelerated to a high velocity by pressurized air flowing from chamber 1 into cooling holes 5). Therefore, because in Kildea pressurized air and grit 9 is *introduced* into cooling hole 5 (*see* Kildea, col. 2, ll. 12–14), i.e., "internal passageway," and cooling air flows through cooling hole 5 during operation (*see id.*, col. 1, ll. 13–16, 54–56), Kildea discloses "establishing a flow of machining fluid . . . in a same direction as . . . flow of

cooling fluid within the internal passageway during operation of an engine [component]," as recited by claim 1.

Accordingly, for the foregoing reason, we sustain the rejection under 35 U.S.C. § 102(a)(1) of claim 1 as anticipated by Kildea. Claims 2–5, 8, 10, and 11 fall with claim 1.

Claims 12 and 13

Claims 12 and 13 require, *inter alia*, that the Reynolds number of the machining fluid flowing within an internal passageway of an engine component substantially match the Reynolds number of the cooling fluid flowing within the internal passageway during operation of the engine component. *See* Appeal Br. 9–10 (Claims App.).

The Examiner finds that "the *Reynolds number* . . . include[s] a wide variety of values" due to various variables that affect its value and the various power levels and fluid velocities found in a turbine during operation. Final Act. 3–4; Ans. 8 ("The Reynolds number is a dimensionless value calculated using the velocity, density, and viscosity of the flowing fluid."). Thus, according to the Examiner, because "Kildea teaches [that] the [machining] fluid is pressurized air," which "is precisely the same fluid that would flow into the coolant channels of the turbine blade during operation," a skilled artisan would reasonably infer that the machining fluid of Kildea will have a Reynolds number that matches at least one value in the range of *expected Reynolds number[s] ... during operation.*" Final Act. 4 (citing MPEP § 2144.01) ("implicit disclosures are not inherencies"); Ans. 8.

Appellant argues that "there is no basis for concluding that Kildea's flow substantially matches any Reynolds number during engine operation"

and, moreover, "Kildea does not imply a Reynolds number of cooling flow during operation because Kildea introduces flow in the opposite direction." Appeal Br. 6.

We appreciate the Examiner's position that "it is proper to take into account not only specific teachings of the reference but also the *inferences* which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968) (emphasis added). However, the reference must include specific teachings that allow a person of ordinary skill in the art to draw inferences to fill in the gap and thus get to the missing limitation. *See In re Baxter Travenol Labs*, 952 F. 2d 388, 390 (Fed. Cir. 1991) (As "Becker referred to Baxter's commercial system and Baxter's commercial systems utilized a DEHP-plasticized primary bag, it is clear that one skilled in the art would have known that Becker was referring to a DEHP-plasticized primary bag.").

In this case, although the flow of both Kildea's machining fluid (pressurized air and grit 9) and cooling fluid (pressurized air) can be characterized by the Reynolds number, the Examiner does not point to any specific teachings in Kildea that would allow a person of ordinary skill in the art to draw a reasonable inference that the Reynolds number of the machining fluid (pressurized air and grit 9) is "substantially matching" the Reynolds number of the cooling fluid (pressurized air). In particular, as Kildea is devoid of any mention of Reynolds numbers, it is not clear from the Examiner's rejection how a skilled artisan would reasonably draw an inference about matching Reynolds numbers. Moreover, a skilled artisan would reasonably recognize that Kildea's pressurized air and grit 9 will have a different density and viscosity than pressurized air, i.e., cooling fluid, due

to the presence of grit 9. *See In re Jacoby*, 309 F.2d 513, 516 (CCPA 1962) (An artisan must be presumed to know something about the art apart from what the reference discloses.). Accordingly, Appellant is correct that "[a]t best, the Examiner has established a *possibility* of a matching Reynolds number," which "is not sufficient for anticipation." Reply Brief (filed Dec. 10, 2019, hereinafter "Reply Br.") 2 (emphasis added).

Hence, for the foregoing reasons, we do not sustain the rejection under 35 U.S.C. § 102(a)(1) of claims 12 and 13 as anticipated by Kildea.

Rejections II and III

Claims 2–4, 6, 7, and 9 depend directly or indirectly from independent claim 1. *See* Appeal Br. 8–9 (Claims App.). As Appellant does not separately argue the rejections of these claims (*see id.* at 7), for the same reasons discussed *supra* in regards to the rejection of independent claim 1, we sustain the rejections under 35 U.S.C. § 103 of claim 9 as unpatentable over Kildea and of claims 2–4, 6, and 7 as unpatentable over Konter and Kildea.

CONCLUSION

Claim(s) Rejected	**35 U.S.C. §**	**Reference(s)/ Basis**	**Affirmed**	**Reversed**
1–5, 8, 10–13	102(a)(1)	Kildea	1–5, 8, 10, 11	12, 13
9	103	Kildea	9	
2–4, 6, 7	103	Konter, Kildea	2–4, 6, 7	
Overall Outcome			**1–11**	**12, 13**

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 IN PART