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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/100,413	05/31/2016	Daniel A. SNYDER	67097-2786PUS1;74599US02	1428

54549 7590 10/02/2020

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ART UNIT	PAPER NUMBER
3745	

NOTIFICATION DATE	DELIVERY MODE
10/02/2020	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte DANIEL A. SNYDER and JEFFREY S. BEATTIE

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Appeal 2019-006572
Application 15/100,413
Technology Center 3700

_____

Before CHARLES N. GREENHUT, MICHAEL L. HOELTER, and ANNETTE R. REIMERS, *Administrative Patent Judges*.

REIMERS, *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 claims 1–13 and 16–22. Claims 14 and 15 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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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 Raytheon Technologies Corporation. *See* Update to Real Party in Interest, filed Apr. 23, 2020.

CLAIMED SUBJECT MATTER

The claimed subject matter "relates to a gas turbine engine, and more particularly to a gas turbine engine rotor blade having a platform cooling passage." Spec. ¶ 2. Claims 1, 13, and 16 are independent.

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

1. A rotor blade, comprising:

a platform defining a gas path surface and a non-gas path surface opposed to said gas path surf ace that each extend between leading and trailing edges of said platform;

a root that extends radially inwardly from said non-gas path surface;

an airfoil that extends radially outwardly from said gas path surface of said platform and that extends in a chordwise direction between a leading edge and a trailing edge;

a platform cooling passage extending inside of said platform; and

said platform cooling passage including an inlet disposed through said non-gas path surface of said platform and an outlet disposed through a mate face of said platform, wherein said inlet is an opening disposed through said non-gas path surface and is located upstream from said leading edge of said airfoil, and said opening is spaced apart from said leading edge of said platform.

THE REJECTIONS[2]

I. Claims 1, 2, 4, 5, 8, 10, 12, 13, 16, 17, 19, and 20 stand rejected under 35 U.S.C. § 103 as unpatentable over De Cardenas (US 6,945,749 B2, issued Sept. 20, 2005) and Torii (US 8,231,348 B2, issued July 31, 2012).

II. Claims 3 and 18 stand rejected under 35 U.S.C. § 103 as unpatentable over De Cardenas, Torii, and Halfmann (US 2012/0093649 A1, published Apr. 19, 2012).

III. Claims 6, 7, 9, 11, 21, and 22 stand rejected under 35 U.S.C. § 103 as unpatentable over De Cardenas, Torii, and Liang (US 8,641,377 B1, issued Feb. 4, 2014).

ANALYSIS

Rejection I – Obviousness over De Cardenas and Torii

Appellant does not offer arguments in favor of independent claims 13 and 16 and dependent claims 2, 4, 5, 8, 10, 12, 17, 19, and 20 separate from those presented for independent claim 1. Appeal Br. 3–4.[3] We select claim 1 as the representative claim, and claims 2, 4, 5, 8, 10, 12, 13, 16, 17, 19, and 20 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv) (2018).

In regard to claim 1, the Examiner finds that De Cardenas discloses a rotor blade comprising a platform cooling passage (channel 30) including an

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[2] The following rejections have been withdrawn: (a) claim 22 under 35 U.S.C. § 112(a) for failing to comply with the written description requirement (Final Office Action ("Final Act.") 4, dated Dec. 4, 2018); (b) claims 1–13, 21, and 22 under 35 U.S.C. § 112(b) as indefinite (*id.* at 4–5 (claim 13 is not listed in the header but is discussed in the body of the rejection)); and (c) claims 1–3, 8, 10, 16, and 18–20 under 35 U.S.C. § 102(a)(1) as anticipated by Lacy (US 2011/0223004 A1, published Sept. 15, 2011) (*id.* at 5). *See* Examiner's Answer ("Ans.") 3, dated July 25, 2019; Advisory Action ("Advisory Act.") 2, dated Jan. 29, 2019.

[3] Appeal Brief ("Appeal Br."), filed Mar. 15, 2019.

inlet (cooling hole 36) disposed through a non-gas path surface[4] of a platform 14 and an outlet (passage 110) disposed through an adjacent mating face (side 42) of the platform 14. Final Act. 8–9 (citing De Cardenas Figs. 3, 7). The Examiner acknowledges that De Cardenas does not disclose that its inlet (cooling hole 36) is located upstream from its leading edge 16 of airfoil 12. *Id.* at 9. The Examiner, however, finds that Torii discloses an inlet (convection cooling hole 017) located upstream from the leading edge of its airfoil. *Id.* (citing Torii Fig. 5). The Examiner concludes that it would have been obvious to a skilled artisan to modify De Cardenas' rotor blade to have its inlet located upstream from the leading edge of the airfoil, as disclosed by Torii, "for the purpose of increasing the axial length of the platform that is cooled." *Id.*

Appellant contends that "the rejection fails to establish that one would have been motivated to have made the Examiner's proposed modification" because:

(1) "[t]he cooling holes 36 of De Cardenas do not appear to extend to an upper surface of the platform 14," whereas Torii's cooling hole 017 does extend to the upper surface of its platform and

(2) "[t]he cooling hole 017 of Torii does not appear to be utilized to convey cooling flow to a channel," whereas De Cardenas' cooling holes do convey cooling flow to a channel. Appeal Br. 4.

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[4] We note that the term "non-gas path surface" suggests that no gas moves along the surface. The Specification and figures disclose that a "cooling fluid" F is communicated along a non-gas path surface 70 in which the non-gas path surface is opposite to the gas-path surface 68 of platform 62. *See* Spec. ¶¶ 20, 46, 50, 53, Fig. 2. We thus construe the term "non-gas path surface" as a surface opposite to the gas-path surface of a platform, rather than a surface in which gas does not move along.

These arguments are unpersuasive in that they do not address the rejection as set forth by the Examiner. The Examiner relies on Torii solely for disclosing the location of its cooling hole 017 in relation to the leading edge of the airfoil, rather than for disclosing a cooling channel separate from cooling hole 017. *See* Final Act. 9; Ans. 4–5. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Further, Appellant appears to be arguing that once some modification of De Cardenas is made based on a bodily incorporation of one or more specific teachings in Torii, such as having the inlet upstream from the leading edge of the airfoil, further modification is additionally needed to result in the invention set forth in claim 1. *See* Appeal Br. 4. One of ordinary skill can use his or her ordinary skill, creativity, and common sense to make the necessary adjustments and further modifications to result in a properly functioning device. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) ("the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ"). Furthermore, the test for obviousness is not, whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. "It is well-established that a determination of obviousness based on the teachings from multiple references does not require an actual, physical substitution of elements." *See Keller*, 642 F.2d at 425. ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . .").

Appellant contends that the rejection is merely based on "'demonstrating that each of its elements was, independently, known in the prior art,' [which] is insufficient to establish *prima facie* obviousness."

Appeal Br. 4 (quoting *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)); *see also* Reply Br. 2.[5]

However, the Examiner does not merely base the rejection on elements that are independently known—rather, the Examiner explains that it would have been obvious to modify De Cardenas' rotor blade to have its inlet located upstream from the leading edge of the airfoil, as disclosed by Torii, "for the purpose of increasing the axial length of the platform that is cooled." Final Act. 9; *see also* Ans. 5. Thus, the Examiner has articulated sufficient reasoning, supported by a rational underpinning drawn from the cited references, for the combination of De Cardenas and Torii. *See KSR Int'l*, 550 U.S. at 418. Accordingly, Appellant does not apprise us of Examiner error.

Appellant contends that De Cardenas and Torii are not analogous art. *See* Appeal Br. 4.

Appellant does not provide a reason for this bald statement. *See id.* The Examiner correctly responds that "both references are directed towards gas turbine engine platform cooling schemes and, thus, are analogous." Ans. 5. In other words, we agree with the Examiner that De Cardenas and Torii are in the same field of Appellant's endeavor (gas turbine engine platform cooling) and are thus, analogous art. *See In re Clay*, 966 F.2d 656, 658 (Fed. Cir. 1992).

In summary, and based on the record presented, we are not persuaded the Examiner erred in rejecting independent claim 1 as obvious over De Cardenas and Torii. Accordingly, we sustain the Examiner's rejection of

[5] Rely Brief ("Reply Br."), filed Sept. 3, 2019.

claim 1. We further sustain the rejection of claims 2, 4, 5, 8, 10, 12, 13, 16, 17, 19, and 20, which fall with claim 1.

Rejection II – Obviousness over De Cardenas, Torii, and Halfmann

Claims 3 and 18 are argued together. *See* Appeal Br. 5. We select claim 3 for review. 37 C.F.R. § 41.37(c)(1)(iv) (2018). Claim 3 recites "said inlet is fed with a cooling fluid communicated through a *neck pocket* disposed in a neck of said root that extends from said platform." Appeal Br. 9 (Claims App.; emphasis added). Claim 18 recites a similar limitation. *Id.* at 11. The Examiner acknowledges that the combination of De Cardenas and Torii fails to disclose this limitation and relies on Halfmann for disclosing the missing limitation. Final Act. 13–14 (citing Halfmann Figure 2, noting delivery channel 240' corresponds to the recited neck pocket).

Appellant contends that "[t]he rejection fails to establish that one would have been motivated to have made the Examiner's proposed modification" because Halfmann "appears to disclose inlet 236 being fed with the alleged cooling fluid from delivery channel 240'"[6] but that the independent claims require the inlet opening to be spaced apart from the leading edge of said platform. Appeal Br. 5; *see also* Reply Br. 3.

Again, Appellant's argument does not address the rejection as set forth by the Examiner and appears to rely on an improper bodily incorporation argument similar to that discussed above. The Examiner already finds that De Cardenas discloses an opening of the inlet spaced apart from the lead edge of the platform (Final Act. 9) and relies on Halfmann for

[6] Although not clear from this argument, Appellant appears to be asserting that Halfmann discloses its inlet 236 as not being spaced apart from the leading edge of platform 228. *See* Halfmann Fig. 2.

disclosing a neck pocket (*id.* at 14). *See also* Ans. 6–7. Appellant does not apprise us of Examiner error on this point.

For these reasons, we sustain the Examiner's rejection of claim 3 as obvious over De Cardenas, Torii, and Halfmann. We further sustain the rejection of claim 18, which falls with claim 3.

Rejection III—Obviousness over De Cardenas, Torii, and Liang

Claims 6, 11, and 21:

Appellant does not provide substantive arguments as to the rejection of claims 6, 11, and 21 and relies on the arguments presented for parent claim 1. Appeal Br. 5–7. Accordingly, as we find no deficiencies in the Examiner's rejection of claim 1, we likewise sustain the Examiner's rejection of claims 6, 11, and 21 for reasons similar to those discussed above for claim 1 as obvious over De Cardenas, Torii, and Liang.

Claims 7, 9, and 22:

Claim 7 recites "said outlet is positioned *at said trailing edge* of said airfoil" and claim 9 recites "said outlet is positioned *downstream from said trailing edge* of said airfoil." Appeal Br. 9–10 (Claims App.; emphases added). Claim 22 recites "a length of said passage is axially and circumferentially aligned with said trailing edge of said airfoil such that said passage *passes under said trailing edge* of said airfoil." *Id.* at 11 (emphasis added).

The Examiner acknowledges that the combination of De Cardenas and Torii does not disclose the limitations of claims 7, 9, and 22, but finds that Liang discloses these missing limitations. Final Act. 15–16, 18 (citing Liang Figs. 5–6). With respect to claims 7 and 9, the Examiner concludes that it

would have been obvious to a skilled artisan to modify the rotor blade of De Cardenas and Torii to have an outlet at the claimed position, as disclosed by Liang "for the purpose of providing cooling flow to this particular location in order to achieve a desired cooling effect." *Id.* at 15–16.

Appellant argues that the Examiner's rationale concerning achieving a "desired cooling effect" is conclusory and without rational underpinning because the Examiner's rationale hinges only upon the result of the combination of cited art. Appeal Br. 6; *see also* Reply Br. 3–4.

This argument is unpersuasive. Liang's objective is to provide a "cooling circuit" for its platform. *See* Liang Abstract. We do not find it unreasonable for the Examiner to assert that any portion of Liang's cooling circuit—the passages, outlets, and inlets thereof—are at a particular location for the benefit of providing cooling to that particular location of the platform. As the Examiner correctly responds, "the result of *achieving a desired cooling effect* is inseparable from the reason for making the combination of *providing cooling flow to this particular location*." Ans. 8.

Appellant further argues that Liang's feed holes 32 are "downstream from a leading edge of the airfoil" and "[w]ere one to follow the teachings of Liang, one would move" the inlet of De Cardenas downstream as well. Appeal Br. 6.

Once again, Appellant's argument does not address the rejection as set forth by the Examiner and appears to rely on an improper bodily incorporation argument similar to that discussed above. The Examiner already finds that Torii discloses an inlet located upstream from the leading edge of the airfoil (Final Act. 9) and relies on Liang for disclosing the above recited features of claims 7 and 9 (*id.* at 15–16). *See also* Ans. 8–9.

With respect to claim 22, Appellant contends that the Examiner does not show that the combination of references discloses the limitation "said passage passes under said trailing edge of said airfoil." Appeal Br. 7.

The Examiner correctly responds that Liang's Figure 5 shows cooling channels 23 passing under the trailing edge of its airfoil—much in the same manner as that of the cooling passage 88 shown in Appellant's Figure 3. *See* Ans. 9. Thus, Appellant does not apprise us of Examiner error on this point.

Accordingly, for the reasons discussed above, we sustain the Examiner's rejection of claims 7, 9, and 22 as obvious over De Cardenas, Torii, and Liang.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 2, 4, 5, 8, 10, 12, 13, 16, 17, 19, 20	103	De Cardenas, Torii	1, 2, 4, 5, 8, 10, 12, 13, 16, 17, 19, 20	
3, 18	103	De Cardenas, Torii, Halfmann	3, 18	
6, 7, 9, 11, 21, 22	103	De Cardenas, Torii, Liang	6, 7, 9, 11, 21, 22	
Overall Outcome			1–13, 16–22	

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