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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RICHARD K. HAYFORD, MARK J. ROGERS,
CARL S. RICHARDSON, and JONATHAN J. EARL

Appeal 2020-001764
Application 15/110,856
Technology Center 3700

Before MURRIEL E. CRAWFORD, MICHAEL C. ASTORINO, and
NINA L. MEDLOCK, *Administrative Patent Judges*.

ASTORINO, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), the Appellant¹ appeals from the Examiner's decision to reject claims 2–7, 9–13, and 16–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. The Appellant identifies the real party in interest as United Technologies Corporation. Appeal Br. 1.

STATEMENT OF THE CASE

Claimed Subject Matter

Claims 4 and 13 are the independent claims on appeal. Claim 4, reproduced below, is illustrative of the claimed subject matter.

4. A gas turbine engine comprising:
a circumferential array of vanes slidably supported in an inner case shroud segment, wherein the inner case shroud segment includes an arcuate slot, and the vanes include hooks received in the arcuate slot, multiple inner case shroud segments secured to one another and to an outer case by rings to provide an annular engine static structure section, the inner case shroud segment and the vanes having different material properties than one another, wherein the inner case shroud segment includes at least two rows of the circumferential array of vanes axially spaced from one another.

References

The prior art relied upon by the Examiner is:

Name	Reference	Date
O'Reilly et al. ("O'Reilly")	US 7,278,821 B1	Oct. 9, 2007
Vance et al. ("Vance")	US 7,452,182 B2	Nov. 18, 2008
Lee et al. ("Lee")	US 7,819,626 B2	Oct. 26, 2010
Ress, Jr. ("Ress")	US 8,950,069 B2	Feb. 10, 2015

Rejections

Claims 2–4 and 10–12 are rejected under 35 U.S.C. § 103 as unpatentable over O'Reilly, Lee, and Vance.

Claims 5–7 and 9 are rejected under 35 U.S.C. § 103 as unpatentable over O'Reilly, Lee, Vance, and Ress.

Claims 13 and 16–20 are rejected under 35 U.S.C. § 103 as unpatentable over O'Reilly, Vance, and Ress.

ANALYSIS

Independent Claim 4 and Dependent Claims 2, 3, and 10–12

The Examiner finds that O’Reilly teaches substantially all of the subject matter of independent claim 4. *See* Final Act. 3–5. One the features of independent claim 4 that the Examiner finds O’Reilly fails to teach is that “the inner case shroud segment and the vanes hav[e] different material properties than one another.” *Id.* at 5.

The Examiner finds that Vance “teaches . . . a turbine vane assembly having segments being made of multiple materials including the outer shroud and different vane segments.” Final Act. 6 (citing Vance, col. 5, ll. 32–46). The Examiner explains that Vance’s outer shroud is part of the vane assembly and does not correspond to the claimed “inner case shroud segment.” *See* Ans. 5.

The Examiner determines that it would have been obvious to one of ordinary skill in the art to modify O’Reilly’s vanes so that the vanes would have been made of multiple materials, in view of Vance’s teaching, in order to increase engine efficiency by providing different materials ideal for specific portions of the vane assembly. *See* Final Act. 7 (citing Vance, col. 1, ll. 15–18). The Examiner explains that as a result of the modification, O’Reilly’s vanes would be made of different materials. *See* Ans. 6. Consequently, the Examiner determines “regardless of what material [O’Reilly’s] inner case shroud segment is made of, the modification would result in **at least one of materials** in the vane assembly *inherently* having different material properties compared to the inner case shroud, thus, meeting the scope of the claims as recited.” *Id.* at 6–7 (italics added).

The Appellant argues that “there is no reason why a skilled worker would modify the cited art to provide the claimed feature relating to the case shroud—not a stator vane platform—and its supported vane.” Appeal Br. 5 (emphasis omitted); *see* Reply Br. 1. The Appellant supports this argument by pointing out that “Vance only discloses different materials for the airfoil and the shroud, but notably, the ‘shroud’ in Vance actually corresponds to the inner and outer platforms and not a ‘case shroud.’” Appeal Br. 3 (emphasis omitted) (citing Vance, col. 5, ll. 32–46, Fig. 3). In other words, “the different materials in Vance relate to the airfoil and platform of the stator vane assembly.” *Id.* at 4. The Appellant’s argument is not persuasive of Examiner error.

At the outset, we disagree with the Appellant that “[t]he issue is whether Vance’s different materials for an airfoil and platform can be applied to O’Reilly such that a skilled worker would understand that the case and vanes should be made of different materials.” Reply Br. 1 (emphasis omitted). Notably, the Examiner never relied on a finding that Vance teaches “[an] inner case shroud segment and vanes having different material properties than one another,” as recited by claim 4. Rather, the issue is whether the Examiner properly relied on the theory of inherency to supply a missing limitation in an obviousness analysis. *See PAR Pharma., Inc. v. TWI Pharma., Inc.*, 773 F.3d 1186, 1194–95 (Fed. Cir. 2014) (citations omitted) (“[I]nherency may supply a missing claim limitation in an obviousness analysis”). “[T]o rely on inherency to establish the existence of a claim limitation in the prior art in an obviousness analysis—the limitation at issue necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art.” *Id.* at 1195–96.

As discussed above, the Examiner's rejection relies on Vance's teaching that portions of a vane, including the airfoil and the inner and outer platforms, which have multiple materials, increase engine efficiency by providing different materials ideal for specific portions of the vane assembly. *See* Final Act. 7 (citing Vance, col. 1, ll. 15–18). The Appellant does not dispute this finding. Based on this finding, the Examiner surmises that as a result of the modification of O'Reilly's vanes in view of Vance's teaching, O'Reilly's inner case shroud segment and vanes necessarily would have been made of different materials and therefore, have different material properties than one another. In other words, the Examiner relied on inherency to supply a missing limitation in an obviousness analysis. In this case, we find that the Examiner adequately establishes a basis for the finding of inherency. The Appellant does not challenge the Examiner's finding of inherency.

Thus, we sustain the Examiner's rejection of independent claim 4 and dependent claims 2, 3, and 10–12.

Dependent Claims 5–7 and 9

The Appellant argues that “[t]he addition of Ress does not cure the deficiencies noted above with respect to the § 103 rejection of claim 4.” Appeal Br. 6. For the reasons discussed above, we are not persuaded that the Examiner's rejection of claim 4 is improper. Therefore, the Appellant's argument that Ress does not cure the deficiencies of the rejection of independent claim 4 is not persuasive. Thus, we sustain the Examiner's rejection of dependent claims 5–7 and 9.

Independent Claim 13 and Dependent Claims 16–20

The Appellant argues that the rejection of independent claim 13 and dependent claims 16–20 is “improper for at least reasons discussed above with respect to Vance as applied to claim 4.” Appeal Br. 6. For the reasons discussed above, we are not persuaded that the Examiner’s rejection of claim 4 is improper. For similar reasons, we are not persuaded that the Examiner’s rejection of claims 13 and 16–20 is improper. Thus, we sustain the Examiner’s rejection of independent claim 13 and dependent claims 16–20.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
2–4, 10–12	103	O’Reilly, Lee, Vance	2–4, 10–12	
5–7, 9	103	O’Reilly, Lee, Vance, Ress	5–7, 9	
13, 16–20	103	O’Reilly, Vance, Ress	13, 16–20	
Overall Outcome			2–7, 9–13, 16–20	

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)(iv).

AFFIRMED