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| NORTON ROSE FULBRIGHT CANADA LLP (PWC)<br>1, PLACE VILLE MARIE<br>SUITE 2500<br>MONTREAL, QUEBEC H3B 1R1<br>CANADA |             |                         | EXAMINER<br>BURKE, THOMAS P |                  |
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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* MARK HUZARD CUNNINGHAM,  
EDWARD PARKER VLASIC, and SAMI GIRGIS

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Appeal 2020-000799  
Application 14/287,125  
Technology Center 3700

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BEFORE STEFAN STAICOVICI, JEREMY M. PLENZLER, and  
SUSAN L. C. MITCHELL, *Administrative Patent Judges*.

PLENZLER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 1, 3, 5–10, 12, and 13. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Pratt and Whitney Canada Corp. Appeal Br. 2.

### CLAIMED SUBJECT MATTER

The claims are directed to a turbine exhaust case. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A turbine exhaust case (TEC) of a turbofan aeroengine including a mixer for mixing exhaust gases with a bypass air stream, the TEC comprising an annular hub and an annular shroud with said mixer located at a downstream end of the annular shroud, the mixer surrounding the annular hub to form an annular exhaust gas duct positioned radially therebetween, the mixer having an annular wavy configuration to form a plurality of axially extending lobes of the mixer, the plurality of axially extending lobes defining alternating crests and valleys extending divergently to a downstream end of the mixer, a plurality of deswirling struts circumferentially spaced apart with respect to a central axis of the TEC and located within an axial length of the mixer between an upstream end where exhaust gases enter the mixer and the downstream end of the mixer where exhaust gases are discharged from the mixer and mix with the bypass air stream, leading edges of the deswirling struts being either axially aligned with, or located downstream of, a start point where the divergently extending crests and valleys start to extend away from each other, each of the deswirling struts having a cambered profile and extending radially across the annular exhaust gas duct and interconnecting the mixer and the annular hub, the deswirling struts cambered in a direction of an incoming swirling flow of the exhaust gases such that a concave side of the cambered profile faces the incoming swirling flow.

### REFERENCES

The prior art relied upon by the Examiner is:

| <b>Name</b> | <b>Reference</b>      | <b>Date</b>   |
|-------------|-----------------------|---------------|
| Ramm        | US 2010/0031631 A1    | Feb. 11, 2010 |
| Lefebvre    | US 2011/0036068 A1    | Feb. 17, 2011 |
| Hauswald    | DE 10 2010 044 483 A1 | Mar. 8, 2012  |

## REJECTIONS

Claims 1, 3, 6–10, and 13 are rejected under 35 U.S.C. § 103 as being unpatentable over Lefebvre and Ramm.

Claims 5 and 12 are rejected under 35 U.S.C. § 103 as being unpatentable over Lefebvre, Ramm, and Hauswald.

## OPINION

Appellant argues claims 1, 3, 6–10, and 13 as a group. Appeal Br. 7–13.<sup>2</sup> We select claim 1 as representative. Claims 3, 6–10, and 13 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv). Appellant also relies on the arguments presented with respect to claim 1 for the patentability of claims 5 and 12. Appeal Br. 13–14.

The Examiner finds that Lefebvre teaches each limitation of claim 1, including “a plurality of deswirling struts (54),” but “does not teach the details of the deswirling struts” (i.e. “the deswirling struts [being] cambered in a direction of an incoming swirling flow of the exhaust gases such that a concave side of the cambered profile faces the incoming swirling flow”). Final Act. 3. The Examiner finds that “Ramm teaches . . . deswirling struts (7) [that] have a cambered profile . . . in a direction of an incoming swirling flow of the exhaust gases . . . such that a concave side of the cambered profile faces the incoming swirling flow.” *Id.* Appellant does not dispute these findings.

The Examiner reasons that “[i]t would have been obvious . . . to modify Lefebvre to include the cambered profile of the struts as taught by

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<sup>2</sup> For simplicity, we cite only to Appellant’s arguments in the Appeal Brief, as the contentions presented in the Reply Brief are reiterations of those from the Appeal Brief.

Ramm in order to deflect the hot gas in the axial direction so that the hot gas is as non-rotational as possible (Paragraph 0018).” Final Act. 4. Appellant responds that: (1) Lefebvre teaches away from the proposed combination (*id.* at 7–10); (2) the proposed combination would not have yielded predictable results (*id.* at 10–13); and (3) the proposed combination is based on conclusory statements (*id.* at 13).

Appellant contends that “the purpose of the struts of Lefebvre and those of Ramm are very different” because “Lefebvre aims at minimizing the impact the struts have on the flow circulating therearound whereas Ramm aims at imparting a force on said flow.” Appeal Br. 8. Specifically, Appellant contends that “the struts of Lefebvre modified as suggested by the Office in view of Ramm will create more obstruction on the incoming flow and will impart a force on said incoming flow,” which “Lefebvre[ teaches] would unfavorably increase turbulence and back pressure.” *Id.* at 9.

Appellant is correct that Lefebvre teaches its “struts 54 hav[ing] a generally aerodynamic profile for limiting any obstruction of the high velocity flows passing through the main gas path 26.” Lefebvre ¶ 25. As the Examiner notes, however, Lefebvre explains that its embodiments are merely exemplary, and various aerodynamic strut profiles can be used. Ans. 4; Lefebvre ¶ 25 (“The specific mixer strut aerodynamic profile shown in FIG. 7 is *exemplary* only.” (emphasis added)). Appellant responds that “even if a person skilled in the art were to use a different profile . . . , this person would never opt for a profile that would display a greater transversal width” or “for a profile that would impart a force on the incoming flow.” Appeal Br. 9. Appellant’s contention is not persuasive.

We fail to see a teaching in Lefebvre that discourages the use of the proposed modification. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (A teaching away requires “criticiz[ing], discredit[ing], or otherwise discourag[ing] the solution claimed.”). Rather than being discouraged from the proposed modification, one skilled in the art would have appreciated the trade-offs between mixing and obstructions to flow, as expressly taught by Ramm. *See, e.g.*, Ramm ¶ 4 (“As the degree of mixing increases, the flow losses also increase as a rule. A good mixer therefore represents a compromise between these two effects.”).

Appellant’s contentions regarding the alleged lack of predictable results are similarly unpersuasive. Appellant contends that “there are many differences between the mixers of Lefebvre and of Ramm” and “stresses here that designing a mixer is a complicated and cumbersome task.” Appeal Br. 11. Appellant’s contentions, however, amount to no more than unsupported allegations, which do not apprise us of error. Appellant references a declaration by one of the named inventors, Mark Huzzard Cunningham, submitted in a related application (15/673,047) (“the Cunningham Declaration”). *Id.* at 12. The Cunningham Declaration was filed in the related proceeding after this appeal, and is not in the record in this proceeding. We do not consider the Cunningham Declaration in this appeal. *See* 37 C.F.R. § 41.33(d)(2) (explaining that evidence filed after appeal will not be admitted, except for certain circumstances).<sup>3</sup>

Moreover, even if that declaration was properly before us, it would not be persuasive of Examiner error because of the internal inconsistencies

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<sup>3</sup> As noted above, the Cunningham Declaration was never filed in this proceeding.

therein and the lack of any evidence supporting the statements therein relied on by Appellant. For example, Dr. Cunningham summarily concludes, without supporting evidence or meaningful explanation, that “it is clear to me that the struts 54 [in Lefebvre] are not configured to remove a circumferential component of the flow exiting the turbine section of the gas turbine engine” and “[t]hey are simply not long enough in term of their chord length to exert a force on the surrounding flow that would act to change a circumferential component of the flow circulating around them.” Cunningham Declaration ¶ 7. Dr. Cunningham similarly concludes that he is “positive that if the struts 54 were able to change a circumferential component of the flow circulating around them—by changing an angle of attack or with a cambered aerodynamic profile for instance—they would impart turbulence to the flow around them and, hence, they would clearly generate vibrations.” *Id.* ¶ 8. Dr. Cunningham then testifies that “due to the complexity of the flow circulating through those mixers, their real-life performances are very difficult to predict, even with current tools such as computational fluid dynamics.” *Id.* ¶ 13. Accordingly, in view of these internal inconsistencies and lack of supporting evidence, Dr. Cunningham’s testimony would receive little weight, even if properly before us.

Appellant’s contention that the rejection is based on conclusory statements is baseless. As noted above, the Examiner cites Ramm’s express disclosure to support the reason for the proposed modification to Lefebvre’s teachings. Final Act. 4 (citing Ramm ¶ 18). Indeed, consistent with the Examiner’s explanation, Ramm expressly states that “[t]he hot gas exiting from the rearmost guide blade ring 4 with rotation . . . is deflected in the

axial direction by the profiled and curved . . . struts 7 of the guide ring and is therefore as non-rotational as possible.” Ramm ¶ 18.

For at least the reasons set forth above, we are not apprised of Examiner error.

### CONCLUSION

The Examiner’s rejections are affirmed.

### DECISION SUMMARY

In summary:

| <b>Claims Rejected</b> | <b>35 U.S.C. §</b> | <b>Reference(s)/Basis</b> | <b>Affirmed</b>    | <b>Reversed</b> |
|------------------------|--------------------|---------------------------|--------------------|-----------------|
| 1, 3, 6–10, 13         | 103                | Lefebvre, Ramm            | 1, 3, 6–10, 13     |                 |
| 5, 12                  | 103                | Lefebvre, Ramm, Hauswald  | 5, 12              |                 |
| <b>Overall Outcome</b> |                    |                           | 1, 3, 5–10, 12, 13 |                 |

### TIME PERIOD FOR RESPONSE

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**