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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DANIEL G. EDWARDS

Appeal 2018-007420
Application 14/734,066
Technology Center 3700

Before MICHELLE R. OSINSKI, WILLIAM A. CAPP, and JILL D. HILL, *Administrative Patent Judges*.

OSINSKI, *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 rejecting claims 1–7, 9, 10, and 12–15.[2] We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We use the term "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Rolls-Royce North American Technologies, Inc. Appeal Br. 2.

[2] Claims 8 and 11 are cancelled. Appeal Br. 17, 19 (Claims App.).

THE CLAIMED SUBJECT MATTER

Claims 1, 6, and 10 are independent. Claim 1 is reproduced below.

1. A turbofan engine comprising:

a fan mounted on a first shaft for rotation of the fan about a first axis of rotation;

at least one internal gear mounted on the first shaft aft of the fan;

a low pressure compressor located aft of the fan;

an air inlet for directing airflow into the low pressure compressor, the air inlet located between the fan and the low pressure compressor;

an engine core located aft of the low pressure compressor;

a low pressure turbine located aft of the engine core;

a second shaft for rotatably supporting the low pressure turbine and low pressure compressor about a second axis of rotation;

at least one second gear affixed to the second shaft forward of the low pressure compressor;

wherein the at least one second gear meshes with the at least one internal gear to drive the first shaft; and

wherein the first axis of rotation is parallel to and radially off-set from the second axis of rotation and the air inlet is asymmetrical to the first and second axis of rotation.

EVIDENCE

The Examiner relied on the following evidence in rejecting the claims on appeal:

Morley	US 3,121,526	Feb. 18, 1964
Marche	US 2011/0314788 A1	Dec. 29, 2011

REJECTIONS

I. Claims 1–3, 6, 7, 10, 12, and 13 stand rejected under 35 U.S.C. § 102(a)(1) as anticipated by Morley. Final Act. 2–3.

II. Claims 1–7, 9, 10, and 12–15 stand rejected under 35 U.S.C. § 103 as unpatentable over Marche and Morley. *Id.* at 4–7.

OPINION

Rejection I

The Examiner finds that Morley discloses all of the limitations of independent claims 1, 6, and 10. Final Act. 2–3. In particular, the Examiner finds, among other things, that Morley discloses fan 14, low pressure compressor 11, and air inlet duct 31 between fan 14 and low pressure compressor 11. *Id.* at 2. The Examiner finds that "the air inlet is asymmetrical to the first and second axis of rotation [24, 29]." *Id.* at 3.

The Examiner takes the position that Morley's compressor 11 can be considered a "low pressure compressor" because "[a] 'low pressure compressor' is . . . simply a compressor that operates at a low pressure" and "the compressor 11 of Morley may be considered a 'low pressure compressor', relative to a different reference pressure (i.e.[,] some given pressure higher than compressor 11's operating pressure."). Ans. 2. The Examiner also states that "the claim does not define any other compressor to provide a reference point for 'low pressure'" and compressor 11 "receives air from the fan [14] and the air inlet [31]." Final Act. 2.

The Examiner also takes the alternative position that "the compressor 11 of Morley comprises a series of stages" and "[w]ith each subsequent stage that the air passes, it is compressed to higher and higher pressures" in which "[t]he first stage of compressor 11 operates at a lower pressure than the subsequent stage, until the air reaches the last stage of compressor 11, which operates at the highest pressure in the series of stages." Ans. 2. Thus, the Examiner finds that "one or more stages

upstream of the last stage" of Morley's compressor 11 can be considered a low pressure compressor and the last stage can be considered a high pressure compressor. *Id.* at 2–3.

Appellant argues that the Examiner's reliance on Morley's compressor 11 as a low pressure compressor is in error, such that the Examiner's reliance on air inlet 31 as the claimed air inlet for directing airflow into low pressure compressor 11 is also in error. Appeal Br. 8–10. Appellant argues that a "low pressure compressor prepares the air for entry into the high pressure compressor, where the air is further compressed before introduction into the combustor" and "[t]he Examiner's assertion that item no. 11 in Morley is a 'low pressure compressor' flies in the face of that understanding." *Id.* at 8. Appellant also points out that "Morley specifically identifies compressor 11 as the high pressure compressor, not the low pressure compressor." *Id.* at 9 (boldface omitted) (citing Morley 2:33–37; 3:3–7; Fig. 2). Appellant further argues that the recitation in the claims of "an engine core located aft of the low pressure compressor" is indicative of the presence of a high pressure compressor because "[i]t is . . . well known in the art that an engine core includes a high pressure compressor." *Id.* at 9–10; *see also* Reply Br. 5 ("Because 'core' has been defined to include the high pressure compressor, the independent claims that include 'core' also include the limitation of a high pressure compressor.").

Morley describes "[a] gas turbine engine 10 [that] comprises a high pressure compressor 11 which is driven from a turbine 12 through a first shaft 13," wherein "[t]he shaft 13 is arranged to drive a low-pressure compressor or fan 14 through a reduction gear 16." Morley 2:28–32. Morley further describes that "[a]ir compressed in the low pressure

compressor or fan 14 is divided into two flow paths, one of which flows into the high pressure compressor 11 where the air is further compressed before passing into combustion equipment 15 where fuel is burned in the air." *Id.* at 2:33–37.

As pointed out by Appellant, Morley describes both low pressure compressor or fan 14, as well as high pressure compressor 11. Appeal Br. 9. Thus, Morley's compressor 11 is considered high pressure relative to compressor or fan 14. The Examiner's position that compressor 11 may be considered low pressure relative to some other given pressure that is higher than compressor 11's operating pressure (Final Act. 2; Ans. 2) is unreasonable given Morley's description of compressor 11 being high pressure relative to fan 14. In other words, there is a reference point for "low pressure" and "high pressure" in Morley, and Morley's compressor 11 cannot reasonably be considered a "low pressure" compressor. As to the Examiner's alternative position in which the Examiner identifies Morley's compressor 11 as both a low pressure compressor and a high pressure compressor by designating earlier stages of compressor 11 as a low pressure compressor and at least one later stage of compressor 11 as a high pressure compressor (Ans. 3), we find such a position to be unreasonable in light of how one of ordinary skill in the art would characterize a single compressor as either "low pressure" or "high pressure," but not both.

Accordingly, the Examiner's reliance on air inlet 31 as the claimed air inlet for directing airflow into a low pressure compressor is in error. Consequently, the Examiner has not adequately explained how Morley discloses an air inlet for directing airflow into a low pressure compressor, in which the air inlet is asymmetrical to the first and second axis of rotation.

For the foregoing reasons, Appellant apprises us of error in the Examiner's determination that Morley anticipates independent claims 1, 6, and 10. Accordingly, we do not sustain the rejection of claims 1, 6, and 10, and claims 2, 3, 7, 12, and 13 depending therefrom, under 35 U.S.C. § 102(a)(1) as anticipated by Morley.

Rejection II

Appellant presents arguments for independent claims 1, 6, and 10 together (Appeal Br. 11–14) and relies on the same arguments for dependent claims 2–5, 7, 9, and 12–15 (*id.* at 14–15). We select claim 1 as representative of the issues that Appellant presents in the appeal, and claims 2–5, 7–9, and 12–15 stand or fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds, among other things, that Marche teaches "an air inlet aft of the fan [9a] for directing airflow into the low pressure compressor wherein . . . the air inlet is asymmetrical to the first and second axis of rotation [la, La]." Final Act. 4. More specifically, the Examiner finds that "nearly the entire air inlet duct is asymmetrical to both axes (the entire inner wall of the air inlet aft of the fan have different curvatures above and below the axes)." *Id.* at 7. The Examiner's rejection indicates that "Marche is silent as to the at least one second gear meshes with the at least one internal gear to drive the first shaft," but concludes that it would have been obvious for the at least one second gear to mesh with the at least one internal gear to drive the first shaft "as taught by Morley" because "combining . . . prior art elements according to known methods to yield predictable results renders the limitation obvious." *Id.* at 5 (citing MPEP § 2141 (III)).

Appellant argues that "the Examiner has failed to provide the 'articulated reasoning with some rational underpinning to support the legal conclusion of obviousness,' required by *KSR* and its progeny." Appeal Br. 11. We do not find Appellant's argument persuasive in that it does not address with any specificity the rationale set forth by the Examiner with respect to the obviousness of having at least one second gear mesh with the at least one internal gear to drive the first shaft.

Appellant also argues that "the air inlet 26 is specifically identified in the application[] as the point when the air flow 18 begins to be directed and received." Appeal Br. 12 (citing Spec. ¶ 16, Fig. 1). Appellant argues that it is error for the Examiner to "equat[e] the 'entire air inlet duct' [with] the air inlet" such that it is error by the Examiner to rely on portions other than the beginning of the air duct to show asymmetry. *Id.* at 13. Appellant asserts that in "the Marche reference, the place where directing and receiving engine core airflow is at the beginning of the air duct identified by the Examiner" when "applying the definition of air inlet found in Applicant's disclosure." *Id.* According to Appellant, to the extent the Examiner is relying on the beginning of the air duct in Marche, "[i]t is clear that the beginning of the air duct of Marche is symmetrical to Marche's axis of rotation 'la.'" *Id.* at 14.

The Examiner responds that "the [S]pecification labels element 26 as the air inlet," "the drawings show element 26 as being an inlet duct between the fan and low pressure compressor" and the lead line for reference number 26 "points to a center of the duct." Ans. 4–5. The Examiner finds that "[a]n 'air inlet' may be a passage or a duct" and "[t]here is no support in the

[S]pecification or drawings for Appellant's assertion that the 'air inlet' must be the beginning of the duct." *Id.* at 5.

We agree with the Examiner that Appellant has not adequately supported that the broadest reasonable interpretation of "air inlet" is limited specifically to the beginning of the duct, and that the term "air inlet" reasonably cannot refer to the entire duct. We have considered the Specification, including paragraph 16 as specifically pointed out by Appellant, but do not see where giving the claims the "broadest reasonable interpretation consistent with the specification" and "in light of the specification as it would be interpreted by one of ordinary skill in the art," would preclude the claimed "air inlet" from extending to the entire air duct. *In re Am. Acad. of Sci. Tech Ctr*., 367 F.3d 1359, 1364 (Fed. Cir. 2004). When giving the term "air inlet" the broadest reasonable interpretation, the Examiner's finding that Marche teaches an air inlet duct that is asymmetrical to the first and second axis of rotation (Final Act. 7; Ans. 5) is supported by a preponderance of the evidence.

Moreover, the Examiner further responds that "even if for the sake of argument the air inlet must be considered the beginning of the duct (which Examiner does not concede), Marche still teaches the air inlet being asymmetric to both the first and second axes, as the inner wall has a different geometry at different circumferential points." Ans. 6; *see also id.* at 7 (including the Examiner's annotated version of a portion of Figure 2 of Marche in which the Examiner indicates how even the beginning of the duct "ha[s] different geometry at different circumferential points."). Appellant does not respond with sufficient particularity to this finding in the Answer to persuade us of error.

For the foregoing reasons, Appellant does not apprise us of error in the Examiner's determination that Marche and Morley render obvious the subject matter of independent claim 1. Accordingly, we sustain the rejection of claim 1, and claims 2–7, 9, 10, and 12–15 falling therewith, under 35 U.S.C. § 103 as unpatentable over Marche and Morley.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–3, 6, 7, 10, 12, 13	102(a)(1)	Morley		1–3, 6, 7, 10, 12, 13
1–7, 9, 10, 12–15	103	Marche, Morley	1–7, 9, 10, 12–15	
Overall Outcome			1–7, 9, 10, 12–15	

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