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400 West Maple Road
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EXAMINER

ADJAGBE, MAXIME M

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte EDWARD J. GALLAGHER, BYRON R. MONZON,
LING LIU, LINDA S. LI, DARRYL WHITLOW, and
BARRY M. FORD

Appeal 2017-004144
Application 14/624,666
Technology Center 3700

Before MURRIEL E. CRAWFORD, MICHAEL W. KIM, and
PHILIP J. HOFFMANN, *Administrative Patent Judges*.

HOFFMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellants¹ appeal from the Examiner's rejection of claims 1–30. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ According to Appellants, the real party in interest is “UNITED TECHNOLOGIES CORPORATION.” Appeal Br. 1.

According to Appellants, their invention “relates generally to an airfoil for gas turbine engines, and[,] more particularly[,] to the leading and trailing edge sweep for a fan or compressor blade.” Spec. ¶ 2. Claims 1 and 27 are the only independent claims on appeal. Appeal Br., Claims App. We reproduce claim 1, below, as illustrative of the appealed claims.

1. An airfoil for a turbine engine comprising:

an airfoil having pressure and suction sides and extending in a radial direction from a 0% span position at an inner flow path location to a 100% span position at an airfoil tip, wherein the airfoil has a curve corresponding to a relationship between a trailing edge sweep angle and a span position, wherein the trailing edge sweep angle is in a range of 10° to 20° in a range of 40–70% span position, and the trailing edge sweep angle is positive from 0% span to at least 95% span.

REJECTIONS AND PRIOR ART

The Examiner rejects the claims as follows:

- I. Claims 1–7, 9–11, 13–18, 20, 22, 24, and 25 on the ground of nonstatutory obviousness-type double patenting² as unpatentable over claims of U.S. Application no. 14/624,774³;
- II. Claims 1–20 and 24⁴ under 35 U.S.C. § 103(a) as unpatentable over Doloresco (US 2005/0031454 A1, pub. Feb. 10, 2005) and “an engineering expedient”⁵;

² The Examiner “provisionally reject[s]” these claims. Answer 3.

³ U.S. Application no. 14/624,774 issued as US Patent no. 9,605,542, on March 28, 2017.

⁴ Based on our review of the record, we agree with Appellants’ understanding that the Examiner’s reference to claim 25 is a typographical error, and that it is, instead, claim 24 that is rejected based on Doloresco and “an engineering expedient.” *See, e.g.*, Answer 5, 9, 10; *see, e.g.*, Appeal Br. 3.

⁵ *See, e.g.*, Final Office Action mailed January 21, 2016, 7.

- III. Claims 21 and 25 under 35 U.S.C. § 103(a) as unpatentable over Doloresco, “an engineering expedient,” and Merville (US 2014/0248155 A1, pub. Sept. 4, 2014);
- IV. Claims 22 and 23 under 35 U.S.C. § 103(a) as unpatentable over Doloresco, “an engineering expedient,” and Wood (US 2010/0260609A1, pub. Oct. 14, 2010); and
- V. Claims 26–30 under 35 U.S.C. § 103(a) as unpatentable over Gilson (US 2013/02219922 A1, pub. Aug. 29, 2013), Doloresco, and “an engineering expedient.”

ANALYSIS

Rejection I

For the reasons discussed *infra*, we do not sustain any of the Examiner’s obviousness rejections. We decline to reach the merits of the Examiner’s provisional double-patenting rejection. *See Ex parte Moncla*, 95 USPQ2d 1884 (BPAI 2010) (precedential). Rather, we leave it to the Examiner to determine whether to withdraw the rejection or whether a terminal disclaimer would be required before the application issues as a patent. *See* MPEP § 804(I)(B)(1).

Rejection II

Based on our review of the record, including the Examiner’s Final Office Action and Answer, and Appellants’ Appeal Brief and Reply Brief, the Examiner does not support adequately the obviousness rejection of claims 1–20 and 24 based on Doloresco and an engineering expedient. Thus, we do not sustain the rejection of these claims.

As set forth above, independent claim 1 recites, among other recitations, that “the [airfoil’s] trailing edge sweep angle is in a range of 10° to 20° in a range of 40–70% span position, and the trailing edge sweep angle is positive from 0% span to at least 95% span.” Appeal Br., Claims App.

With respect to independent claim 1, the Examiner determines that

Doloresco does not specifically teach[]: the trailing edge sweep angle is positive up to at least 95%; the trailing edge sweep angle is in a range of 10° to 20° in a range of 40–70%

An engineer in the design phase of an airfoil for a particular application would[,] as a routine practice[,] take the steps to obtain a desired noise reduction, tip clearance[,] and overall airfoil/blade efficiency that are based upon sweep angle and dihedral angle.

Answer 6.

Appellants argue that the Examiner’s determination is erroneous, because

a skilled worker would have no reason to modify Doloresco’s airfoil profile with the trailing edge sweep recited in independent claims 1 and 27, as doing so would destroy [Doloresco’s] goal of providing an airfoil with a “blended . . . stagger, dihedral and sweep . . . resulting in a distinctive overall configuration and corresponding performance enhancement” [*see* Doloresco ¶¶ 39, 40, 44].

Appeal Br. 5; *see also id.* at 4; *see also* Reply Br. 2 (“the Examiner still does not provide any reason as to why [a] skilled worker would modify Doloresco to provide the claimed features.”).

It is well settled that “[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *See KSR Int’l Co. v. Teleflex Inc.*, 550

U.S. 398, 418 (2007). In this case, Doloresco discloses an airfoil with a positive sweep angle on a trailing edge from the root (0% span position) to about the 80% span position, after which the sweep angle is negative.

Doloresco ¶ 40; *see also id.* at Fig. 6. This differs from claim 1’s recitation that “the trailing edge sweep angle is *positive* from 0% span to *at least 95% span.*” Appeal Br. Claims App. (emphases added). Further, Doloresco clearly shows that the positive trailing-edge sweep angle is always less than 10 degrees, and, more specifically, always appears to be less than 5 degrees. Doloresco Fig. 6. Conversely, claim 1 recites that “the trailing edge sweep angle is in a range of 10° to 20° in a range of 40–70% span position.” Appeal Br., Claims App.

In view of the differences between the claimed trailing-edge sweep angle and Doloresco’s trailing-edge sweep angle, the Examiner’s statement that “[a]n engineer in the design phase of an airfoil for a particular application would[,] as a routine practice[,] take the steps to obtain a desired noise reduction, tip clearance[,] and overall airfoil/blade efficiency,” and, thus, provide an airfoil with the claimed trailing edge characteristics (Answer 6), is insufficient to support the rejection. For example, it is not clear how modifying Doloresco’s airfoil to have the claimed trailing-edge characteristics would affect noise, tip clearance, or efficiency, or even if modifying Doloresco’s airfoil to have the claimed characteristics would affect noise, tip clearance, or efficiency at all. Conversely, Doloresco discloses that its airfoil, in fact, is designed to “maximize . . . performance.” Doloresco ¶ 24.

Thus, based on the foregoing, we do not sustain the Examiner’s obviousness rejection of claim 1. Further, we do not sustain the obviousness

rejection of claims 2–20 and 24 that depend from claim 1, which the Examiner rejects with claim 1.

Rejections III and IV

Claims 21–23 and 25 depend from claim 1, the rejection of which we do not sustain. *See* Appeal Br., Claims App. The Examiner does not establish that either Merville or Wood remedies the above-discussed deficiency in claim 1’s rejection. Thus, we do not sustain the Examiner’s obviousness rejections of claims 21–23 and 25.

Rejection V

With respect to the Examiner’s obviousness rejection of claim 26, this claim depends from claim 1, the rejection of which we do not sustain. *See* Appeal Br., Claims App. The Examiner does not establish that Gilson remedies the above-discussed deficiency in claim 1’s rejection. Thus, we do not sustain claim 26’s rejections.

With respect to the obviousness rejection of independent claim 27, as stated by Appellants, the Examiner “rel[ies] upon Doloresco modified by ‘engineering expedient,’” to render obvious claim 27’s recitation that “the trailing edge sweep angle is in a range of 10° to 20° in a range of 40–70% span position, and the trailing edge sweep angle is positive from 0% span to at least 95% span.” Appeal Br. 3; *id.* at Claims App. Thus, we do not sustain the Examiner’s obviousness rejection of claim 27 for substantially the same reasons we do not sustain claim 1’s rejection. Further, we do not sustain the obviousness rejection of claims 28–30 that depend from claim 27, and which the Examiner rejects with claim 27.

Appeal 2017-004144
Application 14/624,666

DECISION

We REVERSE the Examiner's obviousness rejections of claims 1–30.

REVERSED