



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
**United States Patent and Trademark Office**  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/798,582	07/14/2015	Joe Ott	74142US02(14-242-2)	8960
52237	7590	01/31/2020	EXAMINER	
Bachman & LaPointe, P.C. 900 Chapel St., Suite 1201 New Haven, CT 06510			UTT, ETHAN A	
			ART UNIT	PAPER NUMBER
			1783	
			MAIL DATE	DELIVERY MODE
			01/31/2020	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* JOE OTT, STANLEY J. FUNK, ROGER O. COFFEY,  
SHAWN STEMPIŃSKI, JOHN J. RUP JR., LYUTSIA DAUTOVA,  
and DENNIS M MOURA,

---

Appeal 2019-003835  
Application 14/798,582  
Technology Center 1700

---

Before JEFFREY W. ABRAHAM, MONTÉ T. SQUIRE, and  
JANE E. INGLESE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

Appellant<sup>2</sup> appeals under 35 U.S.C. § 134(a) from the Examiner’s decision rejecting claims 1, 3, 5, 9, 11, and 21–23.<sup>3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

---

<sup>1</sup> In this Decision, we refer to the Specification filed July 14, 2015 (“Spec.”); Final Office Action dated July 23, 2018 (“Final Act.”); Advisory Action dated Oct. 26, 2018 (“Advisory Act.”); Appeal Brief filed Jan. 14, 2019 (“Appeal Br.”); Examiner’s Answer dated Feb. 19, 2019 (“Ans.”); and Reply Brief filed Apr. 18, 2019 (“Reply Brief”).

<sup>2</sup> We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies United Technologies Corporation as the real party in interest. Appeal Br. 2.

<sup>3</sup> Claims 2, 6–8, and 15–20 are withdrawn and claims 4, 10, 12, 13, and 14 are cancelled. Appeal Br. 4.

We REVERSE.

### CLAIMED SUBJECT MATTER

Appellant's disclosure relates to an additively manufactured component, which includes a heat transfer augmentation feature with a surface finish between about 125–900 micro inches. Spec. ¶ 7; Abstract. Claim 1 illustrates the claimed subject matter on appeal and is reproduced below from the Claims Appendix to the Appeal Brief:

1. An additively manufactured component, comprising:  
a heat transfer augmentation feature with an additively manufactured surface finish that defines *a surface roughness average (Ra) between 125–900 micro inches*, wherein said additively manufactured surface finish includes a defined contour arranged with respect to an airflow to control the airflow turbulence to tailor a heat transfer.

Appeal Br. 16 (key disputed claim language italicized and bolded).

### REFERENCES

The Examiner relies on the following prior art references as evidence in rejecting the claims on appeal:

Name	Reference	Date
Lee	US 6,142,734	Nov. 7, 2000
Morrison et al. (“Morrison”)	US 2009/0183850 A1	July 23, 2009
Nagaraj et al. (“Nagaraj”)	US 2010/0162715 A1	July 1, 2010
Davis, Jr. et al. (“Davis”)	US 2010/0242485 A1	Sept. 30, 2010

## REJECTIONS

On appeal, the Examiner maintains (Ans. 3) the following rejections:<sup>4</sup>

1. Claims 1, 3, 9, 11, and 21 are rejected under 35 U.S.C. § 103 as being unpatentable over Morrison (“Rejection 1”). Ans. 4.

2. Claim 5 is rejected under 35 U.S.C. § 103 as being unpatentable over Morrison as applied to claim 1 above, and further in view of Lee (“Rejection 2”). *Id.* at 8.

3. Claims 22 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Morrison as applied to claim 1 above, and further in view of Davis and Nagaraj (“Rejection 3”). *Id.* at 9.

## OPINION

### *Rejection 1*

The Examiner rejects claims 1, 3, 9, 11, and 21 under § 103 as obvious over Morrison (Ans. 4–8), which we refer to as Rejection 1.

The Examiner determines that Morrison teaches or suggests a component satisfying all of the limitations of claim 1 and concludes the reference would have rendered the claim obvious. Ans. 4–6.

Regarding the surface finish having “a surface roughness average (Ra) between 125–900 micro inches” recitation of claim 1, the Examiner relies principally on paragraph 63 of Morrison for teaching or suggesting that element of the claim. *Id.* at 5. In particular, the Examiner determines that, based on paragraph 63 of Morrison’s disclosure regarding “surface cooling

---

<sup>4</sup> The Examiner’s § 112 rejection of claims 1, 3, 5, 9, 11, and 21–23 for indefiniteness is withdrawn by the Examiner at page 3 of the Answer.

features **74** each having a dimension of less than 200  $\mu\text{m}$ ,” which corresponds to less than 7,874 micro inches, it would have been obvious to one of ordinary skill to have arrived at the claimed surface roughness average (Ra) of between 125–900 micro inches because Morrison’s range encompasses the claimed range. *Id.* at 5 (citing *In Re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003)).

Appellant argues the Examiner’s rejection of claim 1 should be reversed because Morrison does not teach or suggest a surface finish having “a surface roughness average (Ra) between 125–900 micro inches,” as required by the claim. Appeal Br. 13; Reply Br. 1–2. Rather, in contrast to the Examiner’s rejection, Appellant contends that Morrison’s discussion regarding a dimension of less than 200  $\mu\text{m}$  actually refers to the geometry of the cooling feature component itself, i.e., the height or thickness dimension of the cooling feature component, and not to the feature’s surface finish having a surface roughness average (Ra) falling within that range. Appeal Br. 13 (arguing “the stacked arrangement upon which the Examiner apparently relies is not a surface finish but simply the component geometry); *see also* Reply Br. 1–2 (arguing the Examiner is “attempting to conflate” the component geometry with the surface finish).

Appellant’s argument is persuasive because the Examiner has not established by a preponderance of the evidence that Morrison teaches or suggests a surface finish having “a surface roughness average (Ra) between 125–900 micro inches,” as recited in the claim. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (holding the examiner bears the initial burden of establishing a prima facie case of obviousness).

We are not persuaded the portions of Morrison the Examiner cites and relies upon in the rejection teach or suggest a feature with a surface finish having “a surface roughness average (Ra) between 125–900 micro inches,” as recited in the claim. *See* Ans. 5 (citing Morrison ¶¶ 63, 65). Rather, Morrison teaches that the surface cooling features **74** each comprise a three-tiered projection, i.e., stacked arrangement having a size dimension of greater than 500  $\mu\text{m}$  and cooling features **76** having a size dimension of less than 200  $\mu\text{m}$ . Morrison ¶¶ 62, 63, Fig. 6. Although Morrison discusses that the cooling features **74** are located on the internal surface portion **75** of the cooling passages **73** and may include additional surface features **76** stacked thereon having a size dimension, i.e., height or thickness of less than 200  $\mu\text{m}$  (Morrison ¶ 63, Fig. 6), which corresponds to less than 7,874 micro inches, there no specific teaching or suggestion of the cooling features having a surface finish with a surface roughness average (Ra) falling within the claimed range.

Contrary to what the Examiner’s rejection seems to imply, the fact that Morrison may describe cooling features having a height, for example, of less than 7,874 micro inches does not necessarily teach or suggest that the surface finish of the cooling features would necessarily have a surface roughness average (Ra) falling within the claimed range of between 125–900 micro inches, which differs by several orders of magnitude.

As Appellant points out (Appeal Br. 13–14; Reply Br. 1–2), the Examiner appears to misinterpret Morrison’s disclosure at paragraph 63 regarding the size of the cooling features **74** as describing or corresponding to the surface finish of the features. The height or thickness of a cooling feature, however, is not the same thing as that feature’s surface finish or

surface average roughness. Although these characteristics may, perhaps, be related in some general way, which the Examiner does not adequately explain, they are nonetheless two different physical properties. Indeed, the Specification distinguishes between the size/geometric dimensions of the claimed features and the features' surface finish characteristics, which, according to the Specification, differ by several orders of magnitude. See Spec.¶ 56 (describing heat augmentation features **118** between about 0.01–1.0 inches ( $10^4$ – $10^6$  micro inches) in thickness or diameter), ¶ 60 (disclosing that the surface finish **140** is “controlled to be within about 125 – 190 micro inches”), ¶ 62 (disclosing that the surface finish **140** is applied to a fin **150**, for example, and that the fin **150** “may be about 0.02 inches” (20,000 micro inches thick)), Fig. 5 (depicting the height of surface finish **140** in micro inches).

The Examiner also does not identify sufficient evidence or persuasively explain how or why one of ordinary skill in the art would have arrived at a feature with a surface finish having a surface roughness average (Ra) between 125–900 micro inches, as recited in the claim, based on Morrison's disclosure regarding its cooling features having, for example, a height of less than 7,874 micro inches. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (requiring “reasoning with some rational underpinning to support the legal conclusion of obviousness”) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). The Examiner's comments at pages 5–6 and 10–11 of the Answer are not well-taken because they do not meaningfully address Appellant's principal argument that Morrison's disclosure relates to the size or height dimension of the cooling feature **74** feature itself and not to its surface finish, and without more, does not

necessarily teach or suggest the surface finish having surface roughness average (Ra) between 125–900 micro inches, as required by the claim.

Thus, for principally the same reasons provided by Appellant at pages 12–14 of the Appeal Brief and pages 1–2 of the Reply Brief, we are not persuaded the Examiner has established by a preponderance of the evidence that Morrison teaches or suggests a surface finish having “a surface roughness average (Ra) between 125 – 900 micro inches,” as claimed.

We, therefore, do not sustain the Examiner’s rejection of claim 1. Because claims 3, 9, and 21 depend from claim 1 and claim 11 recites the same “surface roughness average (Ra) between 125–900 micro inches” as claim 1, we also do not sustain the Examiner’s rejection of these claims.

Accordingly, we reverse the Examiner’s rejection of claims 1, 3, 9, 11, and 21 under 35 U.S.C. § 103 as obvious over Morrison.

### *Rejections 2 and 3*

The Examiner rejects claim 5 under § 103 as obvious over the combination of Morrison and Lee (Ans. 8), which we refer to as Rejection 2 and claims 22 and 23 under 35 U.S.C. § 103 as obvious over the combination of Morrison, Davis, and Nagaraj (Ans. 9–10), which we refer to as Rejection 3.

The foregoing deficiencies in the Examiner’s findings and analysis regarding the Morrison reference and “a surface roughness average (Ra) between 125 – 900 micro inches” recitation of claim 1 discussed above in reversing the Examiner’s Rejection 1 are not remedied by the Examiner’s findings regarding the additional references or combination of references cited in support of the second and third grounds of rejection.

Accordingly, for principally the same reasons stated above for reversing Rejection 1, we reverse the Examiner's Rejections 2 and 3 stated above.

### CONCLUSION

In summary:

<b>Claim(s) Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 3, 9, 11, 21	103	Morrison		1, 3, 9, 11, 21
5	103	Morrison, Lee		5
22, 23	103	Morrison, Davis, Nagaraj		22, 23
<b>Overall Outcome</b>				<b>1, 3, 5, 9, 11, 21-23</b>

REVERSED