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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOHN P. RIZZO

Appeal 2019-004261
Application 15/022,571
Technology Center 1700

Before N. WHITNEY WILSON, ELIZABETH M. ROESEL, and
MONTÉ T. SQUIRE, *Administrative Patent Judges*.

ROESEL, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1 and 6–9. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

CLAIMED SUBJECT MATTER

The claims are directed to a method of forming a component using electro-chemical machining. According to the Specification, the method is

¹ 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 United Technologies Corporation. Appeal Br. 1.

useful for forming the leading and trailing edges of an airfoil associated with the rotating blades and static vanes of a gas turbine engine. Spec. ¶¶ 2, 3, 30, 34, Fig. 1 (showing an airfoil having a leading edge and a trailing edge). Claims 1 and 6 are illustrative of the claimed subject matter and are reproduced below:

1. A method of forming a component using electro-chemical machining comprising the steps of:

providing a shield in a current distribution path between a workpiece and an electrode, with said shield concentrating current distribution upon an end of the workpiece;

wherein said shield includes two parallel shields that are spaced on sides of said workpiece;

wherein ends of said parallel shields deflect current at said one end of said workpiece; and

a current passing between said electrode and said workpiece, with said current being deflected around ends of each of said shields, and concentrated upon an end of said workpiece, with said end of said workpiece being one of a leading and trailing edge of an airfoil.

6. The method as set forth in claim 1, wherein said shield also sits between said end of said workpiece and said electrode and said shield including an aperture for concentrating said current distribution on said one end of said workpiece.

Appeal Br. 5 (Claims Appendix).

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Arnau ²	DE 696 01 849 T2	Sept. 23, 1999
Platz ³	DE 10 2012 201 052 A1	July 25, 2013

REJECTIONS

The Examiner maintains the following rejections:

1. Claim 6 under 35 U.S.C. § 112(a) as failing to comply with the written description requirement;
2. Claims 1 and 6–9 under 35 U.S.C. § 112(b) as indefinite;
3. Claims 1 and 6 under 35 U.S.C. § 102(a)(1) as anticipated by Platz; and
4. Claims 1 and 6–9 under 35 U.S.C. § 103 as unpatentable over Arnau.

OPINION

Written Description

The Examiner finds that the Specification does not provide adequate written description support for the subject matter of dependent claim 6,

² We use the inventor's name, Arnau, to identify the reference. The Examiner and Appellant refer to Arnau as "Snecma," which is an acronym for Société Nationale D'Etude et de Construction de Moteurs d'Aviation, (S.N.E.C.M.A.), the applicant. We rely on an English translation of Arnau made of record on January 24, 2019.

³ We rely on an English translation of Platz made of record on January 24, 2019.

when read together with independent claim 1 from which it depends. Final Act. 4. Specifically, the Examiner finds that the Specification “does not support parallel shields when the shield(s) sits between an end of the workpiece and electrode.” *Id.*

Appellant contends that Figure 3 provides written description support for claim 6, arguing that “[t]he sides of the one-piece Figure 3 embodiment are each ‘shields,’ and parallel.” Appeal Br. 2; *see also* Reply Br. 1 (“The ‘two parallel shields’ are simply formed from a single piece.”).

After considering Appellant’s Briefs, the Examiner’s Answer, the cited portions of the Specification, and the record as a whole, we determine that Appellant does not identify reversible error in the Examiner’s rejection of claim 6 under 35 U.S.C. § 112(a) as failing to comply with the written description requirement.

Claim 6 depends from claim 1, which recites: “providing a shield in a current distribution path between a workpiece and an electrode, . . . wherein said shield includes two parallel shields that are spaced on sides of said workpiece.” Appeal Br. 5. This claim 1 recitation is supported by Figure 2B of Appellant’s Specification, which is reproduced below:

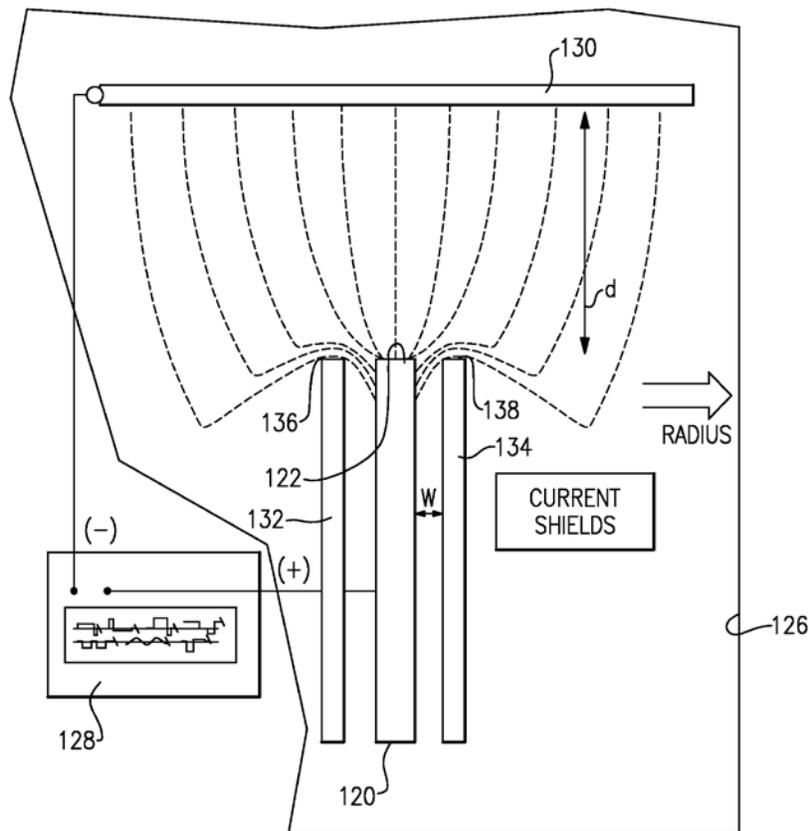


FIG.2B

Figure 2B shows a finishing step of an electro-chemical machining process. Spec. ¶¶ 32, 36, 37. As shown in Figure 2B, shields 132 and 134 are placed on each side of workpiece 120. *Id.* ¶ 38.

Appellant's claim 6 recites, in relevant part, "wherein said shield also sits between said end of said workpiece and said electrode." Appeal Br. 5. As support for claim 6, Appellant directs us to Figure 3 of the Specification, which is reproduced below:

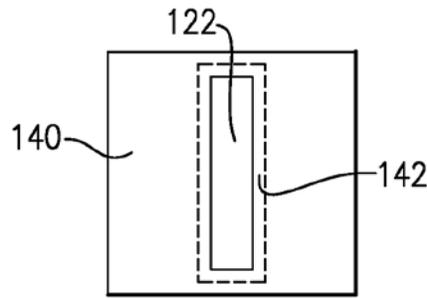


FIG.3

Figure 3 shows an alternative electro-machining method. Spec. ¶ 33. According to the Specification, “Figure 3 shows an alternative shield 140, which is not placed parallel to a second shield. Rather, it sits between the end of workpiece 120 and the electrode 130.” *Id.* ¶ 41.

Appellant contends that Figure 3 provides written description support for claim 6, which recites: “wherein said shield also sits between said end of said workpiece and said electrode.” Appeal Br. 2, 5. According to Appellant, “Figure 3 shows a workpiece shield that has parallel sides surrounding a workpiece end 122,” and “[t]he sides of the one-piece Figure 3 embodiment are each ‘shields,’ and parallel.” *Id.* at 2.

We are not persuaded by Appellant’s arguments. In claim 6, “said shield” is a reference to the shield of claim 1, which recites: “said shield includes two parallel shields that are spaced on sides of said workpiece.” Appeal Br. 5. Claim 6 provides a further description of the same shield, when it recites: “said shield also sits between said end of said workpiece and said electrode.” *Id.* at 5.⁴

⁴ We note that, as originally-filed, claim 6 depended from claim 1, which did not recite two parallel shields. *See* 2016-03-17 Claims. That requirement was recited in original claim 4 (*id.*) and was apparently later added to claim 1 by amendment.

We agree with the Examiner that the Specification “does not support parallel shields when the shield(s) sits between an end of the workpiece and electrode.” Final Act. 4. The Examiner’s finding is consistent with Figure 3 and the description of that figure in paragraph 41 of the Specification. Figure 3 shows a single shield 140, not “two parallel shields,” as recited in claim 1, and paragraph 41 states, “Figure 3 shows an *alternative* shield 140, which is *not* placed parallel to a second shield.” Spec. ¶ 41 (emphasis added).

Paragraph 41 of the Specification thus negates Appellant’s contention that Figure 3 provides written description support for the dual requirements of claim 6, i.e., (1) “said shield includes two parallel shields that are spaced on sides of said workpiece” and (2) “said shield also sits between said end of said workpiece.” Appeal Br. 5 (claims 1 and 6). Paragraph 41 also contradicts Appellant’s contentions that “[t]he sides of the one-piece Figure 3 embodiment are each ‘shields,’ and parallel” (*id.* at 2) and that “[t]he ‘two parallel shields’ are simply formed from a single piece” (Reply Br. 1). Contrary to Appellant’s arguments, paragraph 41 expressly states that Figure 3 is an alternative that does *not* include parallel shields. Spec. ¶ 41.

Because Appellant does not direct us to adequate written description support in the Specification for a shield that both “includes two parallel shields” and “sits between said end of said workpiece and said electrode,” as required by claim 6 (Appeal Br. 5), we affirm the Examiner’s rejection under § 112(a).

Indefiniteness

The Examiner finds that, in claim 1, the phrasing, “an end of the workpiece,” “said one end of said workpiece,” “an end of said workpiece,” and “said end of said workpiece,” makes the claim indefinite. Final Act. 5. According to the Examiner, “it is unclear what end is being referred to given the plurality of ends without further specifying which end is being referenced,” and “[i]t is unclear if the claim is referring to multiple ends, a single end or some other scenario.” *Id.* The Examiner finds that, in claim 6, the phrase “said one end of said workpiece” similarly makes the claim indefinite. *Id.*

The Appeal Brief does not address the Examiner’s indefiniteness rejection. Although the Appeal Brief includes a section headed, “4.1 Rejections under 35 U.S.C. § 112,” that section addresses only the written description rejection, not the indefiniteness rejection. *Compare* Final Act. 4–5, *with* Appeal Br. 2. Appellant challenges the indefiniteness rejection for the first time in the Reply Brief, arguing that “[a] worker of ordinary skill in the art would recognize that it is a single end of the workpiece claimed throughout claim 1.” Reply Br. 1. Nevertheless, Appellant states that it is “willing to amend the claim to address the Examiner’s objection.” *Id.* at 2.

After considering Appellant’s Briefs, the Examiner’s Answer, the claim language, and the record as a whole, we determine that Appellant does not identify reversible error in the Examiner’s rejection of claims 1 and 6 under 35 U.S.C. § 112(b) as indefinite.

Because Appellant’s argument challenging the indefiniteness rejection is presented for the first time in the Reply Brief and is not accompanied by a

showing of good cause, we need not consider it. 37 C.F.R.
§§ 41.37(c)(1)(iv), 41.41(b)(2).

Even if we were to consider Appellant's reply argument challenging the indefiniteness rejection, it is not persuasive. We agree with the Examiner that claim 1's recitation "an end of the workpiece," "said one end of said workpiece," "an end of said workpiece," and "said end of said workpiece," makes the claim indefinite, and that claim 6's recitation of "said one end of said workpiece" similarly makes the claim indefinite. Final Act. 5. It is unclear whether these recitations are referring to the same end or different ends of the workpiece, particularly when two of the claim 1 phrases are introduced by the indefinite article, i.e., "an end."

For these reasons, we affirm the Examiner's rejection of claims 1 and 6–9 as indefinite. For purposes of our review of the prior art rejections, we accept Appellant's representation that the references to "an end," "said one end," and "said end" should be interpreted as referring to the same end. Reply Br. 1.

Platz Anticipation

The Examiner finds that Platz discloses a method of electrochemically machining a workpiece in accordance with claim 1. Final Act. 5–6. The Examiner relies on Platz Figure 3, including engine blade 1, seals 52, and electrodes 55–60. *Id.* at 6; Ans. 4–5, 8–9.

Appellant argues that Platz's seals 52 "do not appear to have any impact on the interaction between the electrodes and the workpiece." Appeal Br. 4. According to Appellant, "[t]here is nothing that would teach current deflection at the ends from the seals 52." *Id.*; *see also* Reply Br. 2 ("[T]here is no disclosure the seals impact the current at all.").

After considering Appellant’s Briefs, the Examiner’s Answer, the cited teachings of the reference, and the record as a whole, we determine that the Examiner’s evidence and findings are not sufficiently supported by the record to sustain the rejection of claims 1 and 6 as anticipated by Platz.

The Examiner relies on Figure 3 of Platz, which is reproduced below:

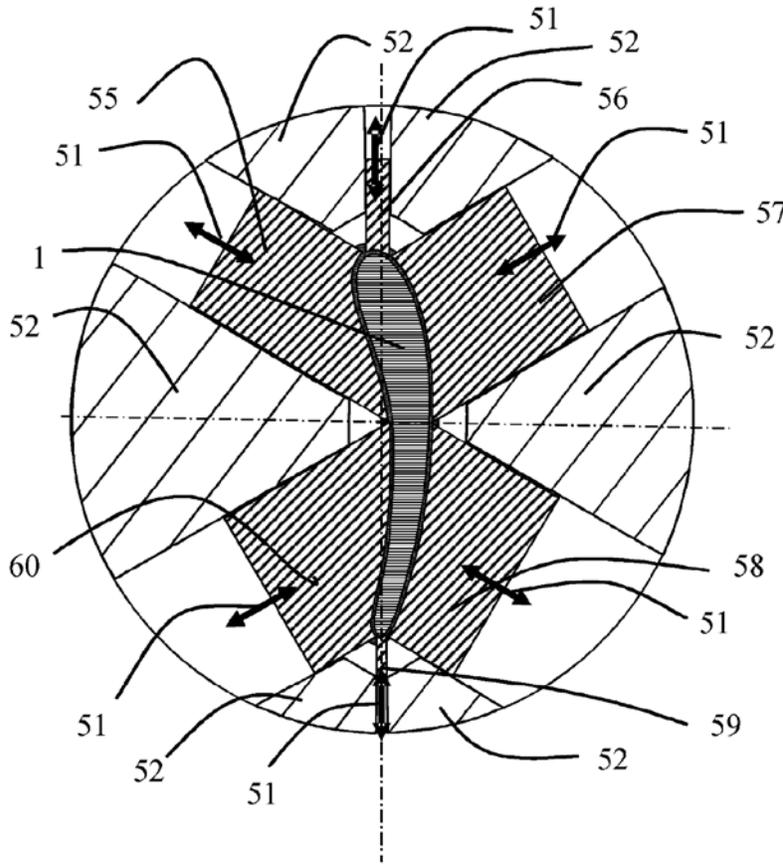


Fig. 3

According to Platz, Figure 3 “shows a cross section through an engine blade 1 and an electrode arrangement arranged in a star shape for machining the engine blade around it.” Platz ¶ 37. Platz Figure 3 shows electrodes 55 to 60, which are separated from one another by sealing elements 52. *Id.* ¶¶ 37, 38. Double arrows 51 show the movement of electrodes 55 to 60 toward and away from engine blade 1. *Id.* ¶ 38.

In the Final Action, the Examiner finds that Platz discloses:

Providing seals (52) in a current distribution path between a workpiece (1) and an electrode (55–60), with said seals concentrating current distribution upon an end of the workpiece (Figure 3). The seals are arranged in a parallel orientation about the workpiece spaced on sides of the workpiece. Given the arrangement of the shields, workpiece and electrodes, the disclosure of Platz reads on the claimed current including wherein ends of said shields deflect current at said one end of said workpiece and a current passing between said electrode and said workpiece, with said current being deflected around ends of each of said shields, and concentrated upon an end of said workpiece. The ends of the workpiece of Platz are the leading and trailing ends of a blade (i.e. airfoil blade).

Final Act. 6. In the Answer, the Examiner additionally finds that, in Platz Figure 3:

[W]hen the electrodes are at a position away from the workpiece, there is present a current distribution path including the electrodes, seals and workpiece. The current distribution path would be impacted by the presence of the seals given their location about the workpiece and their proximity in relation to the electrodes. The Examiner acknowledges spacing between the seals and the workpiece. The spacing provides a pathway for the current between the workpiece and electrode to include the seals.

Ans. 8–9.

We determine that the limitations of claim 1 are not adequately addressed by the Examiner’s findings regarding Platz. Claim 1 requires, among other things, providing a shield that deflects current passing between an electrode and a workpiece and concentrates the current upon either a leading or a trailing edge of an airfoil. Appeal Br. 5. The Examiner asserts that these limitations are disclosed by Platz Figure 3 (Final Act. 4), but does not direct us to any express disclosure in Platz that seals 52 deflect current

that passes between electrodes 55 to 60 and engine blade 1 or concentrate the current upon a leading or trailing edge of the blade. Nor does the Examiner present evidence or technical reasoning sufficient to show that Platz's seals 52 inherently concentrate current upon a leading or trailing edge of engine blade 1. Instead, the Examiner merely finds that "[t]he current distribution path would be *impacted* by the presence of the seals." Ans. 8 (emphasis added). That finding is not sufficient to show that the current would be concentrated upon a leading or trailing edge of the airfoil, as recited in claim 1.

Claim 6 depends from claim 1. The deficiencies in the Examiner's findings and conclusions regarding claim 1 are not remedied by the Examiner's findings and conclusions regarding claim 6. Accordingly, we do not sustain the Examiner's rejection of claims 1 and 6 as anticipated by Platz.

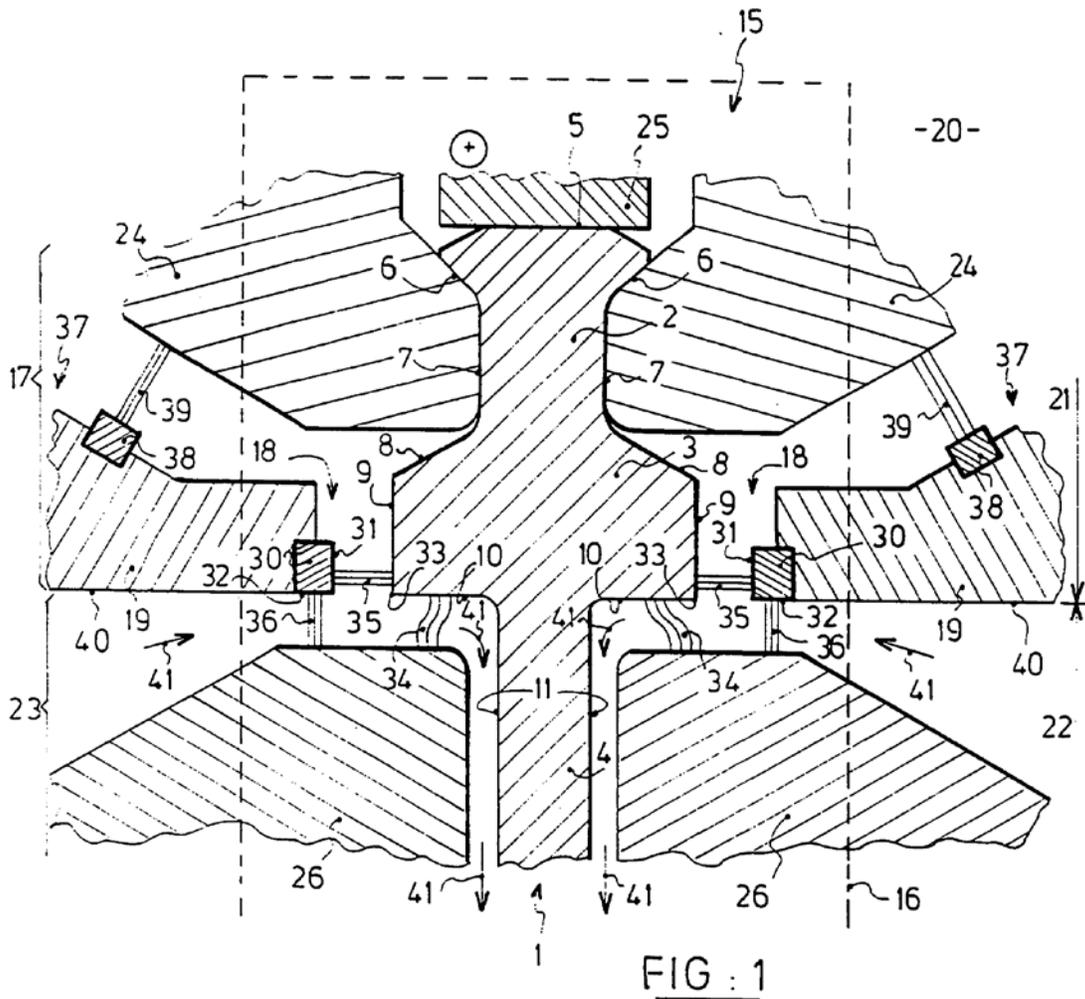
Arnau Obviousness

The Examiner finds that Arnau discloses a method of electro-chemically machining a workpiece, where the method comprises most of the limitations of claim 1. Final Act. 7–8. The Examiner relies on Arnau Figure 1, including blade 1 having airfoil 4, insulating screen 19, cathode 26, and current lines 34–36. *Id.*; Ans. 5–6, 9.

Appellant argues that "the claims require specific spacing between an end of a workpiece that is to become one of a trailing or leading edge of an airfoil, the shields and the electrodes. The reference simply does not provide this positioning." Appeal Br. 4. Appellant additionally argues that "elements 19 in [Arnau] have nothing to do with the airfoil 4" and would not concentrate current on the leading or trailing edge of the airfoil. Reply Br. 2.

After considering Appellant's Briefs, the Examiner's Answer, the cited teachings of the reference, and the record as a whole, we determine that the Examiner's evidence and findings are not sufficient to sustain the rejection of claims 1 and 6-9 as obvious in view of Arnau.

The Examiner relies on Figure 1 of Arnau, which is reproduced below:



Arnau Figure 1 shows a turbomachinery blade during electrochemical machining, including blade 1 having foot 2, platform 3, and airfoil 4. Arnau

¶¶ 38, 39.⁵ Also shown in Arnau Figure 1 are insulating screen 19, cathodes 26, and ring-shaped anode 30 having surfaces 31 and 32. *Id.* ¶¶ 43, 45, 47. Also shown are electric current flow lines 34 extending from cathodes 26 to surfaces 10 of the blade platform, current lines 35 extending from surface 31 to contour 9 of the blade platform, and current flow lines 36 extending from surface 32 to cathodes 26. *Id.* ¶¶ 40, 49, 50.

In the Final Action, the Examiner makes the following findings regarding claim 1 and Arnau:

[Arnau] teaches edges of the blade including an airfoil. [Arnau] does not explicitly disclose the edge as the trailing or leading edge, however, as depicted in Figure 1, the teachings of [Arnau] include treating edges of a blade including an airfoil. One of ordinary skill in the art would expect that the transition from platform (3) to airfoil (4) as depicted in Figure 1 to include at least one of a trailing edge or leading edge. [Arnau] discloses the treatment zone including area (23). Moreover, even if [Arnau] does not explicitly teach processing the trailing or leading edge of the airfoil, one of ordinary skill in the art would apply the electrochemical machining method for treating an airfoil blade including particular regions including a leading or trailing edge for machining the workpiece to produce an airfoil and expect the same or similar predictable result. Further, [Arnau] discloses the workpiece including an airfoil (4, pg. 6). Given the translational movement of [Arnau], one of ordinary skill in the art would expect that the leading edge and/or trailing edge of the airfoil would have a concentration of current.

Final Act. 8. In the Answer, the Examiner makes the following additional findings:

The disclosure of [Arnau] includes two parallel shields (19) that are spaced on sides of the workpiece (1). The current

⁵ We cite to the paragraph numbers of the English translation. The original German language document does not contain paragraph numbers.

distribution path (35, 36) is explicitly labeled in Figure 1 of [Arnau] indicating that the shield(s) are in a current distribution path between a workpiece (1) and an electrode (26) as claimed. Any claimed positioning or spacing that is required is present in the disclosure of [Arnau].

Ans. 9.

We determine that the limitations of claim 1 are not adequately addressed by the Examiner's findings regarding Arnau. Claim 1 requires, among other things, providing a shield that deflects current passing between an electrode and a workpiece and concentrates the current upon either a leading or trailing edge of an airfoil. Appeal Br. 5. The Examiner does not direct us to evidence or technical reasoning sufficient to suggest that Arnau's insulating screen 19 functions to concentrate current upon a leading or trailing edge of airfoil 4. The Examiner asserts, "[o]ne of ordinary skill in the art would expect that the transition from platform (3) to airfoil (4) as depicted in Figure 1 to include at least one of a trailing edge or leading edge." Final Act. 8. We disagree. Appellant is correct that the leading and trailing edges of Arnau's airfoil 4 "would be into and out of the paper of Figure 1." Reply Br. 2; Arnau Fig. 1, ¶ 40 (identifying flanks 11 of airfoil 4); *see also* Spec. ¶ 34, Fig. 1 (identifying leading and trailing edge of an airfoil).

The Examiner further asserts that "[g]iven the translational movement of [Arnau], one of ordinary skill in the art would expect that the leading edge and/or trailing edge of the airfoil would have a concentration of current." Final Act. 8. The Examiner appears to be referring to Arnau's disclosure of "translational movement of . . . cathodes 26 in the direction of the platform 3" during electrochemical processing of airfoil 4. Arnau ¶ 45. The

Examiner does not explain how such movement would have led one of ordinary skill in the art to expect a concentration of current upon a leading or trailing edge of the airfoil. We agree with Appellant that Arnau's insulating screen 19 is not positioned to cause a concentration of current on a leading or trailing edge of an airfoil. Appeal Br. 4; Reply Br. 2. Arnau's insulating screen 19 has a different function, namely to protect first part 17 of blade 1, which includes platform 3, during electrochemical machining of second part 23 of the blade, which includes airfoil 4. Arnau ¶¶ 17, 19, 43, 48; *see also id.* ¶¶ 42, 45 (describing steps b) and e) for machining the first part 17 and second part 23, respectively).

Claims 6–9 depend from claim 1. The deficiencies in the Examiner's findings and conclusions regarding claim 1 are not remedied by the Examiner's findings and conclusions regarding claims 6–9. Accordingly, we do not sustain the Examiner's rejection of claims 1 and 6–9 as obvious over Arnau.

CONCLUSION

The Examiner's § 112 rejections are affirmed, and the Examiner's prior art rejections are reversed.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference/Basis	Affirmed	Reversed
6	112(a)	Written description	6	
1, 6–9	112(b)	Indefiniteness	1, 6–9	
1, 6	102(a)(1)	Platz		1, 6
1, 6–9	103	Arnau		1, 6–9

Appeal 2019-004261
Application 15/022,571

Claims Rejected	35 U.S.C. §	Reference/Basis	Affirmed	Reversed
Overall outcome			1, 6-9	

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