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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* UWE SCHULZE and KNUT PARTES

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Appeal 2020-001654  
Application 15/099,348  
Technology Center 3700

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Before JENNIFER D. BAHR, MICHELLE R. OSINSKI, and  
SEAN P. O'HANLON, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1, 2, 5–7, 10, 15, 17, 21–26, and 28–33. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> 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 MTU Aero Engines AG. Appeal Br. 3.

### THE CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter.

1. A method for repairing a damaged flow channel segment of a turbomachine to extend a lifetime of the flow channel segment, wherein the method comprises:

(a) providing a damaged monocrystalline or directionally solidified flow channel segment, which has a length, a width and a thickness, the length and width extending along the flow channel and each being greater than the thickness, and the width and length delimiting a surface which constitutes a bounding surface of a flow channel and shows damage caused by service of the flow channel segment in a turbomachine,

(b) cleaning the bounding surface to remove impurities therefrom,

(c) remelting at least a part of the bounding surface in a surface region in such a way that melted material solidifies epitaxially in an inner region facing toward unmelted material and forms a structural region in which a monocrystalline or directionally solidified structure is preserved, and that melted material solidifies in a polycrystalline fashion in an outer region which faces toward the flow channel and forms an edge region,

(d) removing the edge region.

### EVIDENCE

The prior art relied upon by the Examiner is:

<b>Name</b>	<b>Reference</b>	<b>Date</b>
Fernihough	US 2005/0067065 A1	Mar. 31, 2005
Greene	US 2009/0252987 A1	Oct. 8, 2009
Plante	US 2015/0226070 A1	Aug. 13, 2015
Burbaum	US 2015/0343563 A1	Dec. 3, 2015

## REJECTIONS<sup>2</sup>

- I. Claims 1, 2, 5–7, 10, 15, 17, 21–26, and 33 stand rejected under 35 U.S.C. § 103 as unpatentable over Greene and Fernihough.<sup>3</sup>
- II. Claims 1, 5, 10, 15, 17, 21, 22, and 28–30 stand rejected under 35 U.S.C. § 103 as unpatentable over Greene, Fernihough, and Plante.<sup>4</sup>
- III. Claims 1, 2, 5–7, 10, 15, 17, 21–26, and 28–33 stand rejected under 35 U.S.C. § 103 as unpatentable over Plante, Greene, Burbaum, and Fernihough.

## OPINION

*Rejection I – Obviousness based on Greene and Fernihough  
Claims 1, 2, 5, 10, 15, 17, 21, 22, and 26*

Appellant presents arguments for independent claim 1 (Appeal Br. 7–12) and does not assert any separate arguments for dependent claims 2, 5, 10, 15, 17, 21, 22, and 26 (*see id.*). We select claim 1 as representative,

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<sup>2</sup> The Examiner withdrew a rejection of claims 1, 2, 5–7, 10, 15, 17, 21–26, and 28–33 under 35 U.S.C. § 112(b) as indefinite. Ans. 10; Advisory Act. 2.

<sup>3</sup> In the Final Action, claims 28–32 were also rejected as unpatentable over Greene and Fernihough. Final Act. 3, 7. However, the Examiner withdrew this rejection with respect to claims 28–32. Ans. 10; Advisory Act. 2.

<sup>4</sup> The statement of this rejection includes claims 31–33. *See* Final Act. 7. However, in the body of the rejection, the Examiner does not set forth any basis for rejecting claims 31–33. *See id.* at 7–8. Instead, the Examiner explains that “the rejections relating to the percentage of the shroud segment remelted are not rejected under this alternate rejection.” *Id.* at 8. Given that each of claims 31–33 recites a limitation specifying a percentage of the shroud segment bounding surface that is remelted, we understand the Examiner’s statement (*id.*) to mean that claims 31–33 are not included under this ground of rejection.

and claims 2, 5, 10, 15, 17, 21, 22, and 26 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

In rejecting claim 1, the Examiner finds that Greene discloses “a repair method for turbine components having defects. Greene teaches providing a turbine bucket, inspecting it for damage, and then repairing the surface. *See* Greene Fig. 2. These repairs would extend the lifetime of the component. During inspection the coatings are removed and the surface is *cleaned.*” Final Act. 4 (citing Greene, Fig. 2). The Examiner finds that Green does not disclose that “the blades being repaired are *monocrystalline or directionally solidified.*” *Id.* However, the Examiner finds that “Fernihough teaches that the turbine blades may be *monocrystalline or directionally solidified.*” *Id.* (citing Fernihough ¶ 35). The Examiner also finds that Fernihough discloses “that such blades sometimes have casting defects.” *Id.* The Examiner determines that “[i]t is obvious to apply a known generic repair technique for turbine blades to known turbine blades.” *Id.* (citing MPEP § 2143(D)).

The Examiner finds that, in Greene’s coating removal step, “[e]xposing the underlying cast turbine blade may result in previously undiscovered casting defects being detected. Such defects would also need to be repaired. Fernihough teaches a method for these repairs.” Final Act. 4 (citing Fernihough ¶¶ 3, 15). The Examiner finds that Fernihough discloses repairing casting defects by remelting at least part of a bounding surface such that melted material solidifies epitaxially and forms a region that preserves monocrystalline or directionally solidified structure. *Id.* (citing Fernihough ¶¶ 17–19, 37–38). The Examiner finds that Fernihough also discloses machining off a surface layer of equiaxed grains, which the

Examiner equates to the claimed polycrystalline outer region facing the flow channel and forming an edge region. *Id.* (citing Fernihough ¶¶ 40, 43). The Examiner determines that it would have been obvious to “use the repair method of Fernihough to repair these casting defects as an extra step during the repair process of Greene because it is obvious to apply a known technique to a known product or method, ready for improvement, to yield predictable results.” *Id.* at 5 (citing MPEP § 2143(D)).

Appellant argues that the Examiner’s rejection is in error because it is based on speculation. Appeal Br. 8. In particular, Appellant asserts that

[t]he Examiner has not explained why it allegedly is likely, let alone certain, that casting defects were present but overlooked before the blade of GREENE was installed in a turbine for the first time and that these overlooked casting defects would thereafter have been detected during the repair of the used blade of GREENE.

*Id.* at 9. Appellant asserts that the Examiner has not cited evidence that casting defects may escape inspection during fabrication. *See id.* at 10 (asserting that Appellant is “not aware that it is allegedly not unusual ‘for defects to escape initial notice during original fabrication’, nor has the Examiner provided any evidence in this regard.”). According to Appellant, “since flow channel segments of a turbomachine apparently are critical components whose failure may have potentially catastrophic consequences it is reasonable to assume that these segments are inspected for defects with utmost care before they are installed in a turbomachine.” *Id.* We are unpersuaded by this argument.

In an obviousness analysis, the relevant inquiry is whether the Examiner has set forth “some articulated reasoning with some rational

underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), *cited with approval in KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Here, as discussed above, the Examiner explains that combining Greene’s repair method with Fernihough’s monocrystalline material and remelting step amounts to the mere application of a known technique to another known method to yield predictable results. *See* Final Act. 4–5. The Examiner also explains that “Greene and Fernihough both relate to repair techniques that are only used if some type of damage or defect is discovered during inspection.” Ans. 11. “If two different repair methods have two different types of damage that can occur to the same airfoil, it is not speculative to presume that at least some of these airfoils will have both, and require both types of repair.” *Id.* The Examiner explains that “it is not speculative to presume that some casting defects would be overlooked. Errors occur.” *Id.* at 12.

Greene teaches a new thermal acoustic imaging technique that was new in 2008 when the patent was filed. *See* Greene [0001]. This new technique did not exist when Fernihough was first filed in 2002. Thus, it is not speculative to presume that this newer thermal inspection technique might detect defects previously overlooked during older fabrications. As such, a turbine blade manufactured in the past may have defects that were undetectable then, but detectable now.

*Id.* The Examiner adds that “Greene teaches inspecting turbine blades using thermal acoustic imaging to find very small cracks,” and “Fernihough teaches that casting defects may be micro cracks among other types of defects.” *Id.* (citing Greene ¶¶ 1, 13; Fernihough ¶ 5). “Thus, the inspection system of Greene would be expected to find these types of casting defects.” *Id.* The Examiner further explains that “Greene teaches one welding system

while Fernihough teaches an alternate remelting technique. Both are suitable (and predictable) for repairing the casting defect crack found, both are known in the art, thus both would have been viewed as obvious to use.” *Id.* In this regard, Appellant does not persuasively refute the Examiner’s position. Appellant asserts in the Reply Brief that the Examiner’s “comments only highlight the speculative approach taken.” Reply Br. 3. However, Appellant does not identify error in the Examiner’s findings and reasoning articulated in support of the conclusion of obviousness. Appellant does not offer any factual evidence or persuasive technical rationale to refute the Examiner’s reasoning or explain why it would be deficient.

Appellant appears to argue that the Examiner improperly relies on inherency and unsupported official notice. *See* Appeal Br. 9–10. The Examiner responds that “the rejection does not rely on stating anything is inherent” and “did not intend to present official notice of any fact, nor is any such official notice made here.” Ans. 12. Appellant does not point to, nor do we discern, any finding of inherency or statement of official notice relied on by the Examiner in the rejection. In other words, these arguments are unpersuasive because they are not responsive to the rejection presented.

Appellant argues that the Examiner errs in interpreting the “bounding surface” recited in claim 1. *See* Appeal Br. 11. In particular, Appellant asserts that

claim 1 can[not] reasonably be interpreted to mean that the “bounding surface” mentioned in step (a) is not necessarily the “bounding surface” mentioned in step (c), i.e., that claim 1 encompasses a method wherein it is not the damaged portion of the flow channel segment that is repaired (remelted) but rather a completely different portion of the flow channel segment that shows no damage but shows (hypothetical) casting defects.



*Id.* Appellant’s argument appears to be that what is remelted in step (c) must be the “surface which constitutes a bounding surface of a flow channel and shows damage caused by service of the flow channel segment in a turbomachine,” as recited in step (a) of claim 1. We are not persuaded by this argument.

Claim 1 recites, in relevant part, “remelting at least a part of the bounding surface.” Appeal Br. 21 (Claims App.). The Examiner explains that

[c]laim 1 never explicitly recites that the remelted *part of the bounding surface* contains the damage caused by service. Rather, the claim allows for a scenario in which the damage caused by service is located at point A within the bounding surface, and will be repaired via welding, and the casting defect is located at a different point B (i.e. the *part*) within the bounding surface and will be repaired via remelting.

Ans. 13; *see also id.* at 14 (explaining that the claim “limit[s] the remelting to a newly introduced *part* of the bounding surface, rather than reciting remelting the whole bounding surface (or reciting remelting the damaged location)”). In other words, claim 1 requires only that a part of the bounding surface is remelted. The claim does not require that the part of the bounding surface remelted necessarily “shows damage caused by service of the flow channel segment in a turbomachine.” It is well established that limitations not appearing in the claim cannot be relied upon for patentability. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982).

For the foregoing reasons, Appellant does not apprise us of error in the Examiner’s conclusion of obviousness with respect to claim 1. Accordingly, we sustain the rejection of claim 1, and claims 2, 5, 10, 15, 17,

21, 22, and 26 falling therewith, under 35 U.S.C. § 103 as unpatentable over Greene and Fernihough.

*Claims 6, 7, 23–25, and 33*

Each of claims 6, 7, 23–25, and 33 depends directly or indirectly from independent claim 1 and recites that a particular percentage of the bounding surface is remelted. Appeal Br. 22–24 (Claims App.). In rejecting these claims, the Examiner finds that

any surface within a flow path creates new sub-paths. Thus, not only may the entire airfoil be considered a *bounding surface* but subsets of the airfoil are likewise bounding surfaces. As such, any size section of the airfoil surface may be defined as the *bounding surface*. Under such a definition, [E]xaminer defines the repair area as the bounding surface. Since the entirety of this area is remelted, claims 5–6, 23–25 are taught.

Final Act. 6; *see id.* at 7 (relying on the same basis for rejecting claim 33).

Appellant argues that the Examiner’s rejection of claims 6, 7, 23–25, and 33 is based upon an incorrect interpretation of “bounding surface.” *See* Appeal Br. 12–13. In particular, Appellant asserts that, “under the definition adopted by the Examiner, any remelted portion of the bounding surface is considered to be 100% of the bounding surface, wherefore indicating different percentages of the bounding surface to be remelted does not make any sense.” *Id.* at 13.

Independent claim 1 recites, in relevant part, a “flow channel segment, which has a length, a width and a thickness, . . . the width and length delimiting a surface which constitutes a bounding surface of a flow channel.” Appeal Br. 21 (Claims App.). Claim 1 also recites “remelting at least a part of the bounding surface.” *Id.* In other words, independent claim

1 expressly defines the bounding surface as a surface delimited by the length and width of the flow channel segment, and at least a part of the bounding surface is remelted (i.e., some percentage of the entire bounding surface). Claims 6, 7, 23–25, and 33, which depend from claim 1, recite particular percentages of the bounding surface that are remelted. Given the definition set forth in claim 1, the Examiner’s attempt in the rejection of claims 6, 7, 23–25, and 33 to redefine the bounding surface as being limited to the area remelted (*see* Final Act. 6) is not commensurate with the scope of the claims. Thus, the Examiner’s rejection based upon this claim construction is in error.

Accordingly, we do not sustain the Examiner’s rejection of claims 6, 7, 23–25, and 33 under 35 U.S.C. § 103 as unpatentable over Greene and Fernihough.

*Rejection II – Obviousness based on Greene, Fernihough, and Plante*

In contesting this rejection of claims 1, 5, 10, 15, 17, 21, 22, and 28–30, Appellant relies on the arguments asserted against Rejection I of claim 1, and contends that Plante does not make up for the argued deficiencies in the combination of Greene and Fernihough. Appeal Br. 14. For the reasons discussed above, Appellant’s arguments do not apprise us of error in Rejection I of claim 1, and, likewise, do not apprise us of error in this rejection of claims 1, 5, 10, 15, 17, 21, 22, and 28–30. Accordingly, we sustain the rejection of claims 1, 5, 10, 15, 17, 21, 22, and 28–30 under 35 U.S.C. § 103 as unpatentable over Greene, Fernihough, and Plante.

*Rejection III – Obviousness based on Plante, Greene, Burbaum,  
and Fernihough*

*Claims 1, 2, 5, 10, 15, 17, 21, 22, 26, and 28–30*

In contesting this rejection of claims 1, 2, 5, 10, 15, 17, 21, 22, 26, and 28–30, Appellant presents arguments without regard to any particular claim. See Appeal Br. 15–19. We select independent claim 28 as representative, and claims 1, 2, 5, 10, 15, 17, 21, 22, 26, 29, and 30 stand or fall with claim 28.

In rejecting claim 28, the Examiner finds that Plante discloses “a cast turbine blade having a shroud. This is a base turbine blade. Plante does not teach repairing this blade.” Final Act. 8. The Examiner finds that “Greene teaches a method of repairing a turbine blade. See Greene [0001]. Greene teaches that turbine blades can become damaged and need repairs.” *Id.* The Examiner also finds that Greene discloses “*cleaning* the surface of a turbine blade to be repaired. It therefore teaches step b.” *Id.* The Examiner determines that “it would have been obvious to use the repair technique of Greene on the turbine blade of Plante, if repair[s] became needed.” *Id.* (citing MPEP § 2143(D)).

The Examiner finds that “[n]either Plante nor Greene explicitly teach[es] that the blade is made of *monocrystalline or directionally solidified* material. Rather, Plante is silent as to the material of the blade, merely stating it is cast.” Final Act. 8. The Examiner determines that it would have been obvious “to make the blade of Plante out of any know[n] material that [is] castable in the turbine arts. Fernihough teaches that *monocrystalline or directionally solidified* material is such a known material.” *Id.* (citing Fernihough ¶ 5). The Examiner explains that “[t]he underlying point, at this point in the rejection, is that turbine blades having shrouds, made of the

material claimed, are known in the art and might need to be repaired after use in a turbine.” *Id.* at 8–9.

The Examiner also finds that “Greene teaches welding repair techniques to repair cracks, but does not teach that these welding techniques involve[] *remelting* the surface in the recited manner.” Final Act. 9.

However, the Examiner finds that Burbaum discloses

repair[ing] cracks in turbine blades using a remelting technique similar to that of the claim. Burbaum differs from claim 28 in two key factors. One, it uses this technique on superalloys in polycrystalline form (not monocrystalline form). Two, Burbaum makes no mention of forming or removing an edge region. Fernihough remedies both of these issues.

*Id.* The Examiner finds that

Greene and Burbaum teach techniques for crack repair in turbine blades. The relevant inquir[y] is whether a person of ordinary skill would think the remelting technique of Burbaum would predictably work on monocrystalline materials. Fernihough would suggest to one of ordinary skill that it would. Fernihough teaches that a highly similar technique was successfully used on the relevant material to repair casting defects. Thus, the remelting technique will work on monocrystalline turbine blades. Burbaum uses this remelting technique for crack repair, but the underlying [principles] are the same. In both cases, a defect of some type is melted away in such a manner that the repaired component will no longer have the defect but will have the original material properties.

*Id.*

Appellant argues that one of ordinary skill in the art would not have combined the teachings of Burbaum with the teachings of Plante, Greene, and Fernihough, as proposed by the Examiner. *See* Appeal Br. 16.

Appellant asserts that “the entire disclosure of BURBAUM relates to a welding method, not to a remelting method.” *Id.* at 17 (citing Burbaum ¶ 2);

*see also id.* (asserting that, although “remelting is occasionally mentioned in BURBAUM, it is mentioned only in combination with (and/or as a consequence of) the welding method”). Appellant also asserts that Burbaum “focuses on a specific aspect of the act of welding, i.e., an a priori calculation of the melting path depth as a function of the laser power used for welding and the heat conduction of the materials to be welded.” Reply Br. 5 (citing Burbaum, Abstract, claim 16, ¶¶ 14, 15); *see also* Appeal Br. 17 (asserting that “BURBAUM is a merely theoretical work”). According to Appellant,

it is only with the benefit of hindsight that one can conclude that in view of BURBAUM and FERNIHOUGH one of ordinary skill in the art would have replaced the repair method for a turbine blade (with integral shroud as allegedly suggested by PLANTE) disclosed in GREENE by a completely different repair method and in particular, a repair method used for removing casting defects (known a long time before the filing date of GREENE).

Appeal Br. 18. We are unpersuaded by these arguments.

Burbaum discloses that “marginal-layer remelting of cracks close to the surface by means of laser radiation is desired in order to close the cracks and in order to retain the mechanical properties of the components to be repaired.” Burbaum ¶ 3. Burbaum discloses that “it is possible to calculate the welding power in order to remelt the crack in an optimally and locally adapted manner at its different crack depths.” *Id.* ¶ 25. The Examiner takes the position that “[t]he term welding is used in Burbaum to refer to the process of applying laser power to remelt the crack region, as explicitly stated in paragraph [0025]. In other words, in Burbaum[,] the welding process is a remelting process.” Ans. 15. Appellant does not contest the Examiner’s position. Instead, in the Reply Brief, Appellant appears to

acknowledge that Burbaum’s welding is a remelting. *See* Reply Br. 5 (asserting that Burbaum “is not at all concerned with the process of welding (‘remelting’) cracks close to the surface of a component of a nickel-based superalloy solidified in polycrystalline form as such”). Additionally, although Burbaum indeed discloses “path-dependent welding power calculated in advance (a priori)” (Burbaum ¶ 6), as asserted by Appellant (Reply Br. 5), Appellant has not set forth any evidence or persuasive technical reasoning to explain how or why the fact that Burbaum performs the welding power calculation in advance would demonstrate error in the Examiner’s conclusion of obviousness.

Here, as discussed above, the Examiner articulates adequate reasoning based on rational underpinnings as to why the combined teachings of Plante, Greene, Burbaum, and Fernihough render obvious the claimed subject matter. *See* Final Act. 8–9. The Examiner explains that

Plante was chosen as the base for this rejection so that a *flow channel* would exist[] regardless of claim interpretation. Plante is silent as to the material of the blade, merely stating it is cast. But the rejection stated that it would be obvious to make the blade out of any know[n] material in the castable turbine arts. Fernihough was used to establish that *monocrystalline or directionally solidified* material was such a known material. Having established the existence of a turbine blade with the right structures and material, the rejection then used Greene to show that turbine blades can become damaged and require inspection, cleaning, and repair. Greene is largely silent on the chosen method of repair (focusing on the inspection technique). So one of ordinary skill would use any known repair technique in the turbine arts. Burbaum is such a repair technique and would be advantageous because it repairs cracks, while maintaining material properties.

Ans. 16. The Examiner further explains that

Burbaum is directed to remelting polycrystalline nickel based superalloys instead of monocrystalline nickel superalloys. This raises an issue in the mind of one of ordinary skill if the repair method of Burbaum would predictably work on a monocrystalline nickel superalloy. The rejection, however, then notes that Fernihough teaches a repair method directed to a similar type of damage (casting defects may be cracks) using a highly similar remelting technique, on monocrystalline nickel superalloy. Thus, one of ordinary skill would use this as evidence that the remelting technique of Burbaum could also predictably work on a monocrystalline blade.

*Id.* In this regard, Appellant does not persuasively refute the Examiner's articulated reasoning. Appellant does not set forth any evidence or persuasive technical explanation as to why the Examiner's reasoning would lack rational underpinnings. *See Kahn*, 441 F.3d at 988, *cited with approval in KSR*, 550 U.S. at 418.

Moreover, Appellant does not identify, nor do we discern, any knowledge relied upon by the Examiner that was gleaned only from Appellant's disclosure and that was not otherwise within the level of ordinary skill at the time of the invention. *See In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971) ("Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from [Appellant's] disclosure, such a reconstruction is proper."). As such, we are unpersuaded by Appellant's contention that the Examiner relied on impermissible hindsight in reaching the determination of obviousness of the claimed subject matter. *See Appeal Br. 18; Reply Br. 5.*

For the foregoing reasons, Appellant does not apprise us of error in the Examiner's conclusion of obviousness with respect to claim 28.



Accordingly, we sustain the rejection of claim 28, and claims 1, 2, 5, 10, 15, 17, 21, 22, 26, 29, and 30 falling therewith, under 35 U.S.C. § 103 as unpatentable over Plante, Greene, Burbaum, and Fernihough.

*Claims 6, 7, 23–25, and 31–33*

The Examiner finds that

none of the references explicitly teach[es] *remelting 50% [of] the bounding surface*. Yet Burbaum shows remelting entire regions to repair cracks. See Burbaum Figs. 1–3. Also the amount of the surface melted is merely a result effective variable linked to the percentage of the surface containing cracks. There is no criticality to the 50% number and thus no patentable significance.

Final Act. 9–10.

Appellant argues that “Figs. 1–3 of BURBAUM relied upon by the Examiner apparently are merely schematic drawings and in particular, cross-sections. No percentages of a remelted surface can be taken or deduced from these drawings.” Appeal Br. 19. This argument is unpersuasive because it is not responsive to the rejection presented. Although the Examiner does cite to Figures 1–3 of Burbaum, the Examiner also takes the position that the amount of bounding surface recited in the claims is a result effective variable, and there is not any criticality to the specific percentage of bounding surface being remelted. Final Act. 9; *see also* Ans. 16 (explaining that “the rejection also states that the repair area is a result effective variable based on the extent of the damage”). In this regard, Appellant does not specifically address the Examiner’s position. Appellant does not proffer any evidence or persuasive technical rationale to refute the

Examiner’s reasoning articulated in support of the conclusion of obviousness.

For the foregoing reasons, Appellant does not apprise us of error in the Examiner’s conclusion of obviousness with respect to claims 6, 7, 23–25, and 31–33. Accordingly, we sustain the rejection of claims 6, 7, 23–25, and 31–33 under 35 U.S.C. § 103 as unpatentable over Plante, Greene, Burbaum, and Fernihough.

**CONCLUSION**

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 2, 5–7, 10, 15, 17, 21–26, 33	103	Greene, Fernihough	1, 2, 5, 10, 15, 17, 21, 22, 26	6, 7, 23–25, 33
1, 5, 10, 15, 17, 21, 22, 28–30	103	Greene, Fernihough, Plante	1, 5, 10, 15, 17, 21, 22, 28–30	
1, 2, 5–7, 10, 15, 17, 21–26, 28–33	103	Plante, Greene, Burbaum, Fernihough	1, 2, 5–7, 10, 15, 17, 21–26, 28–33	
<b>Overall Outcome</b>			<b>1, 2, 5–7, 10, 15, 17, 21–26, 28–33</b>	

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**