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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* KEVIN SAMUEL KLASING, CHING-PANG LEE, PAUL  
HADLEY VITT, and BRIAN DAVID KEITH

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Appeal 2010-006735  
Application 11/507,120  
Technology Center 3700

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Before CHARLES N. GREENHUT, TIMOTHY J. O'HEARN, AND  
BARRY L. GROSSMAN, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision finally rejecting claims 1-3, 11-16, and 26-28. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

CLAIMED SUBJECT MATTER

Claims 1 and 11 are the independent claims on appeal. Claim 1 is representative of the subject matter on appeal, and recites:

1. A turbine blade comprising:

a hollow airfoil, platform, and integral dovetail;

said airfoil including opposite pressure and suction sides extending in span from root to tip and in chord between leading and trailing edges;

said tip including first and second ribs extending outwardly from a tip floor along said pressure and suction sides, respectively, and joined together at said leading and trailing edges; and

a cascade tip baffle transversely bridging said first and second ribs in a one-piece metal casting above said tip floor forward of the maximum width of said tip to partition said tip chordally into corresponding tip pockets on opposite sides of said baffle.

REFERENCES

The Examiner relied upon the following prior art references:

Lee	US 5,738,491	Apr. 14, 1998
Bunker	US 6,027,306	Feb. 22, 2000

REJECTIONS

Appellants seek review of the following rejections (App. Br. 9)<sup>1</sup>:

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<sup>1</sup> Citations to "App. Br. \_\_\_\_" are to the indicated page in the Appeal Brief filed January 8, 2010.

1. Claims 1-3, 11-15, and 26-28 rejected under 35 USC § 102(b) based on Lee; and
2. Claim 16 rejected under 35 USC § 103(a) based on Lee and Bunker.

#### ANALYSIS

##### *Claims 1-3, 11-15, and 26-28*

The Examiner found that Lee disclosed all the elements and limitations called for in claims 1-3, 11-15 and 26-28. Ans. 4.<sup>2</sup> The Examiner also found that “[a]lthough Lee is silent as to flow effects of the baffles, they would inherently operate so as to distribute flow streamlines in a cascade aft over the baffles toward the trailing edge since they provide an impedance to the flow in the chordwise direction along the tip cavity (56).” *Id.* The Examiner treated the claim limitation "metal casting" to be a “product by process limitation” limited to the structure “implied by the steps” unless the “applicant” could show an “unobvious difference”. *Id.*

Appellants argue extensively and in great detail about the alleged errors in the rejections, but the errors they argue can be summarized as the following:

1. Lee does not disclose a cascade tip baffle;
2. Lee does not disclose a baffle transversely bridging the first and second ribs; and
3. Lee does not disclose a cascade tip baffle that is a one-piece metal casting.

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<sup>2</sup> Citations to “Ans. \_\_\_\_” are to the indicated page in the Examiner’s Answer mailed March 4, 2010.

In all these general allegations of error, Appellants argue that the Examiner relies on “[a]ssumption, presumption, speculation, and assertion” rather than evidence to support the rejections. App. Br. 34.

***Whether Lee Discloses a Cascade Tip Baffle***

The claims call for a “cascade tip baffle.” As disclosed in the Specification, element 42 is referred to as a “cascade baffle,” as a “rib,” and as a “tip” baffle, all in the same paragraph (*see, e.g.,* Spec. [0042]; *see also* Spec. [0045]). Also, as disclosed, there may be one or more ribs 42 forming the “cascade tip baffle.” In the exemplary embodiment illustrated in Figures 1-5, there are three ribs or baffles 42 that bridge the tip ribs 36, 38 to correspondingly partition the airfoil tip into four tip pockets 44. Spec. [0055]. Figure 6 illustrates an embodiment in which there are only two ribs or baffles 42. Spec. [0071]. Figure 8 illustrates an embodiment in which there is a single rib or baffle 42. Spec. [0083]. Thus, as shown in the Figure 8 embodiment, the claimed “cascade tip baffle” may be a single rib.

Appellants have not pointed us to any specific recitation in the claims that transforms a single rib 42 as shown and described in the Figure 8 embodiment into a “cascade tip baffle.”

The Specification states that the baffle 42 is disposed obliquely to the leading edge to transversely distribute flow streamlines of the combustion gases 18 in a cascade aft over the baffle toward the trailing edge. Spec. [0046]. The Specification explains that by specifically introducing one or more of the tip baffles 42 to transversely bridge the ribs 36, 38 in the forward portion of the airfoil tip, the incident combustion gas streamlines may be distributed transversely across the baffle in the form of a uniform cascade or waterfall in the downstream direction along the camber line.

Spec. [0051]; *see also*, Spec. [0060]. The Specification and the claims refer to this as a “cascade tip baffle.” *See, e.g.*, Spec. [0054], [0055].

As found by the Examiner, Lee discloses a plurality of ribs 62, which are positioned as claimed for rib 42. Ans. 3-4. Appellants also have not pointed us to any *structural* difference between rib 42 as claimed and rib 62 as disclosed in Lee. Merely labeling a single rib 42 as a “cascade tip baffle” in the claims does not distinguish it from the structure disclosed in Lee. As found by the Examiner, to the extent that rib 42 in the Application is an obstruction in the flow path, so too is rib 62 in Lee. Ans. 4. As found by the Examiner, to the extent that rib 42 in the Application provides a cascade effect, so too does rib 62 in Lee. Ans. 4. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997) (citations omitted). In *Schreiber*, the Federal Circuit held that the absence of a specific disclosure in a reference relating to a *functional* limitation in a claim did not defeat a finding of anticipation where the *structural* limitations are all found in the reference upon which the Examiner relied and the functional limitations were found to be inherent, as they were here. *Id.*

***Whether Lee Discloses a Baffle Transversely Bridging The Ribs***

Claims 1 and 11 also call for first and second ribs (reference numerals 36, 38) extending outwardly from the tip floor (reference numeral 40) with the ribs 36, 38 joined together at said leading and trailing edges, and with the “cascade tip baffle” “transversely bridging” the first and second ribs. The Examiner found that ribs 54(c) and 54(d) in Lee met these claim requirements since Lee discloses that each rib 62 “extends between” the opposite squealer tips 54(c) and 54(d) and atop the tip cap 40. Ans. 6 *citing* Lee column 6, lines 51-54. .

Appellants argue that the phrase “extends between” as used in Lee is substantively different than the claim term “bridging” as used in the claims. App. Br. 14. Appellants have not pointed us to a definition in the Specification of the term “bridging.” Appellants assert, without citation of the source, that “in one dictionary” the term “bridge is defined as “connection, contact, transition.” *Id.*

The Examiner found that, accepting Appellants proffered definition, an “ordinary reading” of the disclosure in Lee is that “each rib 62 extends between the opposite squealer tips” leads to the conclusion that the ribs are connected to and serve as a transition between, and thus “bridge,” the ribs 54(c) and 54(d), as called for in the claims. Ans. 6. We agree.

***Whether Lee Discloses a One-piece Metal Casting***

The claims call for a cascade tip baffle transversely bridging the first and second ribs “in a one-piece metal casting.”

The Examiner treated the limitation “metal casting” as a “product-by-process” limitation. Ans. 4. The Examiner concluded that “casting” is a method step because it defines a structure solely by the method by which it is made. Ans. 7. Based on this analysis, the Examiner concluded that the cascade tip baffle structure called for in the claims is a one-piece metal structure, which is disclosed in Lee. *Id.* As found by the Examiner, the “only difference between Lee's one-piece structure and that claimed is the recited method step, i.e. casting.” *Id.*

Appellants’ argue that there can be “no reasonable dispute that the metal casting recited in Appellants’ claims is, indeed, structurally and functionally different than the fabricated blade of Lee”. Reply Br. 4. Appellants continue their argument by stating that “the special one-piece

metal casting species having no counterpart in the Lee '491 reference which expressly teaches a disparate *fabricated* assembly (emphasis added).”

Reply Br. 5. Appellants also argue that the one-piece metal casting “enjoys *well known structural advantages* including special metallurgical properties” for its use in the extremely hostile environment of a gas turbine engine.

Reply Br. 15 (emphasis added). However, these “well known” structural attributes are not recited in the claims.

Thus, it is clear that Appellants place great weight on the casting process to distinguish over the asserted fabricating process in Lee. This emphasis in Appellants’ arguments is in sharp contrast to the Specification which has only a brief mention of casting. Spec. [0006], [0029].

The well-known, long-standing general rule is that an article cannot be distinguished from the prior art in terms of the process by which it was made unless the article is new and inventive. *In re Welblund*, 162 F.2d 486, 487-88 (C.C.P.A. 1947). *See also, In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985) (“If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.”).

In *Welblund*, the Court found that the use of the process limitation “continuously cast” in defining a claimed article was not a patentable limitation. *Id.* Also some of the claims referred to the properties of the article as “cast.” The Court held that it is considered “immaterial if an article has any given property, whether it had this property ‘as cast’ or acquired it later by a machine process.” *Id.* at 489.

In *In re Marosi*, 710 F.2d 799, 803 (Fed. Cir. 1983), the Federal Circuit held that where a product-by-process claim is rejected over a prior

art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. Here, Appellants have adduced no such evidence commensurate in scope with their claims.

The structure disclosed in Lee anticipates the structure called for in the claims.

Regarding claims 2 and 12, Appellants argue that the cascading flow streamlines called for in these claims results from the orientation of the cascade tip baffle recited in independent claims 1 and 11. App. Br. 17.

The Examiner found the invention claimed in claims 2 and 12 to be anticipated by Lee. To sustain this rejection, Lee must be found to disclose every limitation of the claimed invention, either explicitly or inherently. Anticipation is an issue of fact, and the question whether a claim limitation is inherent in a prior art reference is a factual issue. *See In re Schreiber*, cited and discussed above. Appellants have not identified any *claimed structure* for the ribs/tips/baffle that distinguishes the *claimed structure* from the structure disclosed in Lee. Although Lee does not address the use of the disclosed structure to create a “cascading flow,” the absence of a disclosure relating to function does not defeat the Examiner's finding of anticipation. It is well settled that the recitation of a new intended use for an old product does not make a claim to that old product patentable. *In re Schreiber*, 128 F.3d at 1477 (citations omitted).

Appellants assert that the Background section of the Specification explains the esoteric and complex nature of turbine blade design and conclude, without citation of authority, that “neither inherency nor

predictability are appropriate assertions in patent examination practice.” App. Br. 17. The law is to the contrary; inherency is an appropriate measure for a rejection under Section 102 (*see, e.g., In re Schreiber*, 128 F.3d at 1477). Appellants’ description in the Background section of the Specification does not distinguish the claimed invention from the applied references.

Appellants conclude, without citation of any authority or evidence, that the configuration of the ribs in Lee would not provide a cascade flow as recited in Applicants’ claims. *Id.* at 18. Appellants reach this conclusion based on their allegation that “only through modern CFD analysis can actual performance be predicted, and even that performance requires compromise of competing technical features, overlooked by the examiner.” *Id.* at 17. Here, the Examiner found that Lee disclosed the identical structure called for in the claims. Whatever flow characteristics the claimed structure provides is also provided, inherently, by the identical structure in Lee, as found by the Examiner.

Appellants argue, without citation of supporting authority, that “claims need not so recite such [cascading flow streamlines] pattern because patent law requires the examiner to consider all benefits to the recited structure expressly disclosed in the specification.” App. Br. 18. Again, the law is to the contrary. Where an applied reference discloses every limitation of the claimed invention, either expressly or inherently, the claimed invention is anticipated by the reference and unpatentable under Section 102. The use or alleged benefits of the claimed structure are irrelevant. *In re Schreiber*, 128 F.3d at 1477-1478.

Appellants also argue that the objective of Lee is to control thermal conductivity, not flow patterns. App. Br. 19. The objective of Lee is irrelevant to a rejection under section 102. *State Contracting & Eng'g Corp. v. Condotte America, Inc.*, 346 F.3d 1057, 1068 (Fed. Cir. 2003) (The question of whether a reference is analogous art is not relevant to whether that reference anticipates. A “reference may be from an entirely different field of endeavor than that of the claimed invention or may be directed to an entirely different problem from the one addressed by the inventor, yet the reference will still anticipate if it explicitly or inherently discloses every limitation recited in the claims.” (citations omitted)).

Appellants arguments against the rejections of claims 14, 15, 26, 27, 28 repeat the same arguments as considered above.

Appellants' arguments have not apprised us of any error in the rejection of claims 1-3, 11-15 and 26-28. Accordingly, we sustain these rejections.

### ***Claim 16***

Claim 16 calls for the cascade tip baffle to be arcuate transversely between the first and second ribs.

The Examiner found that Lee discloses the invention substantially as claimed except for the use of arcuate baffles. The Examiner cited Bunker for the disclosure of baffles that may be straight, angled, or arcuate. Ans. 4-5. The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the tip baffles of Lee by utilizing the arcuate profile taught by Bunker. Ans. 5. The rationale provided for this modification was that was the mere combination

of prior art elements according to known methods to yield the predictable result of discouraging flow along the tip in the chordwise direction. *Id.*

Appellants present an extensive argument based on facts, law, and procedure, asserting error in the rejection of claim 16. Appellants argue, in general summary, that there are differences between Lee and Bunker, and that the Examiner has disregarded those differences to “surgically extract” only one feature from Bunker. App. Br. 27.

As held by the Supreme Court:

[W]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007). Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. *Id.* at 420.

The operative question in a rejection based on Section 103 is whether the improvement is more than the predictable use of prior art elements according to their established functions. *KSR*, 550 U.S. at 401. The fact that the reference uses the disclosed structure for one purpose and the claimed invention uses the disclosed structure for a different purpose is not persuasive of error in the rejection. As the Court in *KSR* stated, courts *and*

*patent examiners* should *not* look only to the problem the patentee was trying to solve. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. *Id* at 402.

Appellants' arguments have not apprised us of any error in the rejection of claim 16.

#### DECISION

Upon consideration of the record as a whole in light of Appellants' contentions and the preponderance of relevant evidence, we AFFIRM the rejections of claims 1-3, 11-16, and 25-28.

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

MP