

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RALPH E. SHOWMAN,
CHRISTOPHER A. LUTE, and RONALD C. AUFDERHEIDE

Appeal 2008-6043
Application 10/422,343¹
Technology Center 1700

Decided: December 15, 2008

Before TERRY J. OWENS, LINDA M. GAUDETTE, and MARK NAGUMO,
Administrative Patent Judges.

NAGUMO, *Administrative Patent Judge.*

¹ Application 10/422,343, *Process for Preparing Detailed Foundry Shapes and Castings*, filed 24 April 2003, claiming the benefit under 35 U.S.C. § 119(e) of 60/375,686, filed 26 April 2002. The specification is referred to as the “343 Specification,” and is cited as “Spec.” The real party in interest is listed as Ashland Licensing and Intellectual Property LLC (Appeal Brief, filed 17 July 2007 (“Br.”), 2.)

DECISION ON APPEAL

A. Introduction

Ralph E. Showman, Christopher A. Lute, and Ronald C. Aufderheide (“Showman”) timely appeal under 35 U.S.C. § 134(a) from the final rejection of claims 19, 21, and 23-26. We have jurisdiction under 35 U.S.C. § 6(a). We AFFIRM.

The subject matter on appeal relates to a process of casting molten metals into foundry shapes (molds) made from mixtures of a foundry aggregate that comprises hollow aluminosilicate microspheres instead of the conventional material, sand. The use of hollow microspheres is said to permit finer details, such as identifying markings, to be cast.

Representative Claim 19 is reproduced from the prosecution record:²

Claim 19

A process for tracking and/or identifying a metal part comprising:

- (a) inserting an insert having a raised and/or imprinted marking,
which is made from a mixture comprising hollow
aluminosilicate microspheres and
an effective binding amount of a binder,
into a mold assembly,
whereby said markings are made by crushing
microspheres of the insert and/or removing
microspheres from the insert;
- (b) pouring molten metal into and around said mold assembly;
and
- (c) allowing said molten metal to cool to form a metal part
having a raised and/or imprinted readable marking.

² Amendment under 37 C.F.R. § 1.116 After Final Rejection filed 2 March 2007, at 3, which the Examiner indicated would be entered (Office Communication mailed 15 March 2007). The version of Claim 19 reproduced in the Claims Appendix to the Principal Brief on Appeal is incomplete.

(Claims App., Br. 14; paragraphing and indentation added.)

Claim 21, which depends from claim 19, specifies that the insert is marked by stamping, embossing, cutting, punching or machining the insert.

The Examiner has maintained the following ground of rejection:³

- A. Claims 19, 21, and 23-26 stand rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Steel⁴ and Prat Urreiztieta.⁵

Showman urges that the Examiner erred by failing to establish a *prima facie* case of obviousness. (Br. 7.) Moreover, Showman argues that the Examiner failed to properly credit showings of unexpected results, namely the better casting surface and detail—especially the smaller readable identification marks—obtained from the claimed invention. (Br. 8-9.)

The Examiner finds that Steel teaches all aspects of the claimed invention, including the marking step, but for the use of hollow aluminosilicate microspheres. (Ans 3-4.) The Examiner finds further that Prat Urreiztieta teaches a molding sand for casting that incorporates hollow aluminosilicate microspheres for making foundry molds. (Ans. 3.) The Examiner reasons that because the ordinary worker would have found it obvious to use the molding composition taught by Prat Urreiztieta in the molding processes taught by Steel, the claimed process is unpatentable.

³ Examiner's Answer mailed 29 August 2007. ("Ans."). The Examiner withdrew a rejection over the combined teachings of Steel and a patent issued to Gough "to simplify the issue" on appeal. (Ans. 3.)

⁴ Geoffrey R. Steel et al., *System for Identifying Castings and for Tracking Casting Process Parameters*, U.S. Patent 5,894,005 (1999).

⁵ Jaime Prat Urreiztieta, *Molding Sand Appropriate for the Fabrication of Cores and Molds*, U.S. Patent 6,598,654 B2 (29 July 2003), based on application 09/125,904, which is the national stage of PCT/ES97/00314, which has been accorded a date under 35 U.S.C. § 371(c)(1), (2), and (4) of 1 July 1999.

The dispositive issue in this case is, are Showman's arguments asserting error commensurate in scope with the claimed subject matter?

B. Findings of Fact

Findings of fact ("FF") throughout this Decision are supported by a preponderance of the evidence of record.

The 343 Specification

1. According to the 343 Specification, “[f]oundry shapes used to produce metal castings are typically made by compacting organically or inorganically bonded sand against a pattern or corebox cavity to produce a molded shape. The foundry shapes have the negative shape of the pattern or corebox used to form them.” (Spec. 2:1-4.)
2. The 343 Specification describes the claimed invention in the following broad terms: “[t]he process involves preparing foundry shapes from hollow ceramic microspheres bonded with organic or inorganic binders. The foundry shape is then detailed by machining, cutting, stamping, or otherwise removing material from the foundry shape to provide special shapes, letters, . . . on the surface of the foundry shape.” (Spec. 1:23-27.)
3. According to the 343 Specification, “[t]he binders that are mixed with the hollow aluminosilicate microspheres to form the aggregate mix are well known in the art.” (Spec. 10:19-20.)
4. The 343 Specification relates a number of advantages said to arise from the use of the hollow microspheres, including:
 - (a) easy removal of material by means ranging from “low-tech” (punching using a steel punch and a hammer) to “high tech” (laser cutting) due to the low density, small size, and hollow structure (Spec. 5:4-13);

- (b) the integrity of the mold is maintained on marking due to the crushing of microspheres, which absorbs much of the mechanical energy so the mold is not cracked (Spec. 5:15-19). The crushing of individual microspheres is also said to compact the powder so a smooth dense surface is formed for casting (Spec. 5:19-6:3);
- (c) the low density and low thermal conductivity of hollow microspheres compared to sand is said to permit slower cooling and solidification of the molten metal, which in turn is said to permit the molten metal to flow into smaller cavities in the mold surface, resulting in finer details than is possible with casting in conventional sand-based molds (Spec. 6:10-14.)

Contentions of the Examiner and Showman

Showman's arguments, except as noted *infra*, are restricted to independent claim 19. Showman does not substantially dispute the Examiner's findings of fact regarding the references, including the Examiner's finding that Steel teaches engraving the foundry mold with stylus. (Ans. 6.) Showman contends that the Examiner failed to establish a *prima facie* case of obviousness because the Examiner failed to show that there would have been a reasonable expectation, based on the teachings of the references, of achieving what Showman discovered. (Br. 7.) Consistently, Showman argues that Prat Urreiztieta is concerned with different problems, and that while Steel is concerned with similar marking problems, Steel solves the problem in a different manner. (Br. 10.) Similarly, Showman contends that hollow microspheres would not be separated and collected in a typical foundry sand reclamation process, and hence would not be selected for use in Steel's reclaimable processes. (Br. 10-11.) Showman also urges that the Examiner erred in rejecting the remaining claims, all of which depend from claim 21, because the references do not perform or suggest the marking methods recited

in claim 21. (Br. 12.) The result, according to Showman, is the Examiner relied on hindsight to reject the claims. (Br. 11.) Finally, Showman argues that, even if a *prima facie* case had been made, the Examiner failed to give proper weight to the evidence of unexpected results shown by the superior molds and castings obtained in Example 3 compared to those obtained in Comparative Example A, both of record in the 343 Specification.

We do not find it necessary to review the details of Steel and of Prat Urreiztieta, both because they are not substantively disputed and because, as discussed *infra*, Showman’s arguments rely on limitations that are neither inherent or express in claim 19 and are therefore unpersuasive.

C. Discussion

The burden is on Showman, as the appellant, to prove reversible error in the Examiner’s rejection. *See, e.g., In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) (“On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

Claimed subject matter is not patentable “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made . . . ”. 35 U.S.C. § 103(a). If a claim is broad enough to encompass a single embodiment obvious over the prior art, the claim cannot be patented. *Cf. Application of Muchmore*, 433 F.2d 824, 827 (CCPA 1970) (“since the narrower claims were properly rejected for obviousness, the rejection of the broader claims on that ground must also be affirmed”). Moreover, arguments for patentability fail if they are not based on limitations appearing in the claims. *In re Self*, 671 F.2d 1344, 1348 (CCPA 1982). As our reviewing court has explained on many

occasions, “[i]t is well settled ‘that objective evidence or [sic: of] non-obviousness must be commensurate in scope with the claims which the evidence is offered to support.’” *In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983) (citation omitted).

Showman’s claimed process requires that an insert for a mold be provided wherein the insert is made from a mixture comprising hollow aluminosilicate microspheres and an effective binding amount of a binder. In one embodiment, the insert must have an imprinted marking made by crushing or removing microspheres from the insert. The remaining steps recited in the process are casting metal into the assembly and cooling the formed metal part. Notably, claim 19 does not limit the amount of materials other than hollow microspheres that may be present in the insert or mold. Nor does the claim require that the markings be made only by crushing or removing microspheres from the insert. Moreover, claim 19 does not recite any limitations regarding the size of the markings or their quality, other than that they be readable.

The substitution of materials recognized to be equivalent for a given function or property is a classical indication of *prima facie* obviousness.

Cf. Hotchkiss v. Greenwood, 52 U.S. 248, 266 (1850) (“The improvement consists in the superiority of the material, and which is not new, over that previously employed in making the knob. . . . [b]ut this, of itself, can never be the subject of a patent.”) The field of casting metal in forms is common to the references Steel and Prat Urreiztieta, and also to the claimed process. All three are also concerned at least in part with materials for the forms. That common concern suffices as a reason to combine the references, at least for claims of the present scope.

Showman’s argument that the microsphere-containing foundry material would not be used in processes taught by Steel due to Steel’s concern with recycling foundry materials is not persuasive because that aspect of Steel is, at best, a preferred embodiment. Moreover, Showman has not explained why a person of ordinary skill in the relevant arts would have limited their consideration to “typical”

recovery processes when working with molds containing atypical materials. The evidence of record does not support such a low level of average creativity.

Showman's further arguments against the *prima facie* case of obviousness fail because they rely on advantages that apply only to certain embodiments within the scope of the claimed subject matter. For example, the finer details said to be possible due to the claimed process arise only when the microspheres make up a large majority of the surface of the insert—but claim 19 is not so limited. Moreover, Showman does not dispute the Examiner's finding that Steel teaches marking the form with a stylus, so Showman has not shown that the Examiner relied on references that do not teach all limitations required by claim 21. Similarly, Showman's arguments that the Examiner failed to give due weight to the evidence of unexpected results—namely the superior quality of markings—fail because such arguments are not commensurate in scope with the claimed subject matter.

D. Order

We AFFIRM the rejection of claims 19, 21, and 23-26 under 35 U.S.C. § 103(a) in view of the combined teachings of Steel and Prat Urreiztieta.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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