THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 67

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT J. KOFFRON

Appeal No. 98-0393
Application No. 08/450,271[1]

HEARD: April 6, 1998

Before KIMLIN, WEIFFENBACH and PAK, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

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[1] Application for patent filed May 25, 1995. According to appellant, this application is a continuation of Application No. 08/277,374, filed July 19, 1994; which is a reissue of Application No. 07/770,128, filed October 2, 1991; both abandoned.

This is an appeal from the final rejection of claims 9-20 and 22. Claims 1-8 and 21, the other claims remaining in the present application, have been allowed by the examiner. Claim 9 is illustrative:

9. A method of discharging a molten metal from a receptacle having a discharge nozzle comprising:

opening said discharge nozzle;

inserting a tapered, uniform refractory body not a regular tetrahedron, with a specific gravity less than the specific gravity of the molten metal, at the level of molten metal before said level of molten metal reaches a critical level in the receptacle, and

maintaining the body in an upright orientation in which said body generally conforms with vortex shape at least along a submerged portion of the body by geometrically proportioning the uniform refractory material of the body by shaping other than as a regular tetrahedron so that the center of gravity is below the center of buoyant support.

In the rejection of the appealed claims, the examiner relies upon the following reference:

Koffron	4,601,415	July 22, 1986

Appellant's claimed invention is directed to a method of discharging a molten metal through a nozzle of a receptacle wherein a tapered refractory body having non-regular tetrahedron shape is inserted at the level of the molten metal before it reaches a critical level in the receptacle. The

refractory body is maintained in an upright orientation that generally conforms with the shape of the vortex as the molten metal is discharged. The refractory body is geometrically proportioned by shaping other than as a regular tetrahedron such that its center of gravity is below its center of buoyant support. The refractory body acts as a vortex inhibitor which facilitates discharging the molten metal separately from a slag layer.

The present application is a continuation of U.S. Application No. 08/277,374 which, in turn, is a continuation of U.S. Application No. 07/770,128, which application formed the basis of an appeal to this Board (Appeal No. 93-4088). In a decision dated November 30, 1993, this Board affirmed the examiner's rejection of the appealed claims over the same Koffron reference presently applied. Claim 9 now on appeal generally corresponds to claim 9 in the grandparent application with the exceptions that the refractory body is now defined as "not a regular tetrahedron," and geometrically proportioning the refractory body is now defined as "by shaping other than as a regular tetrahedron."

Appellant has presented separate arguments for patentability for claims 15, 12 and 18. Accordingly, appealed claims 9-11, 13, 14, 16, 17, 19, 20 and 22 stand or fall together with the claims upon which they depend.

In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987); Ex parte Schier, 21 USPQ2d

1016, 1018-19 (Bd. Pat. App. & Int. 1991). See also 37 CFR § 1.192(c)(7) and (c)(8) (1996).

Appealed claims 9-11, 13-17, 19 20 and 22 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Koffron. In addition, claims 9-11, 13-17, 19, 20 and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Koffron. Claims 12 and 18 stand rejected under § 103 as being unpatentable over Koffron in view of the admitted prior art found in appellant's specification.

We have carefully reviewed each of appellant's arguments for patentability, as well as the declaration evidence relied upon in support thereof. However, we fully concur with the examiner that the claimed subject matter is unpatentable over the Koffron reference. Accordingly, we will sustain the examiner's rejections.

We consider first the examiner's rejection of claims 9-11, 13-17 and 19-22 under § 102 over Koffron. As in the Board's opinion in the grandparent application, we find that all material elements of the rejected claims are described by Koffron. Specifically, it is our view that Koffron fairly describes the claimed steps of opening the discharge nozzle,

inserting a uniform refractory body of non-regular tetrahedron shape having a specific gravity less than the specific gravity of the molten metal, and geometrically proportioning the refractory body by shaping it other than as a regular tetrahedron so that its center of gravity is below its center of buoyant support, thereby maintaining the body in an upright orientation which generally conforms with the shape of the vortex. Like the vortex inhibitor of appellant, the specific gravity of the reference inhibitor "is adjusted to buoyantly support the body at the interface of the layer of slag and the layer of molten metal" (compare Koffron at column 2, lines 43-46 with appellant's specification at column 7, lines 9-11). Also, the body of Koffron's vortex inhibitor takes on the shape of a tapered, polygonal body having an apex that is oriented downwardly upon insertion in the molten metal (column 2, lines 8 et seq. and Figure 2). Since both the claimed and referenced inhibitors have a specific gravity which buoyantly supports the inhibitor at the interface of the molten metal and slag layers, it follows that the center of gravity of the referenced inhibitor is below its center of buoyancy. Also, while a tetrahedron is the preferred shape of the referenced

refractory body, Koffron expressly discloses that "a square based pyramid body provides a greater shutdown ratio than the tetra-hedral body of the preferred embodiment, and an octagonal pyramid body effects a substantially greater shutdown ratio for the flow of molten metal through the nozzle" (column 4, lines 64 through column 5, line 1). Hence, when making the non-tetrahedron refractory body, it follows that Koffron necessarily performs the claimed step of geometrically proportioning the body to position its center of gravity below its center of buoyant support in order that its "body generally conforms with the shape of the vortex substantially along its entire length," as required in claim 1 of the reference. We fail to perceive any distinction between the claimed "geometrically proportioning . . . by shaping other than as a regular tetrahedron . . ." and geometrically proportioning the refractory body in accordance with the disclosure of Koffron for obtaining a square based or octagonal pyramid body.

Appellant contends that the declarations of record establish that when the refractory body of Koffron is not of tetrahedral shape a weighting means must be added to the body

in order that its orientation conform with the vortex shape.

Paragraph 11 of the declaration of August 30, 1996 states:

> Body shaping to conform with the shape of the vortex as taught by my previous U.S. Patent No. 4,601,415 would inherently provide a center of gravity below a center of buoyant support only in a limited range of specific gravity for the regular tetrahedron shape of the preferred embodiment in U.S. Patent No. 4,601,415.

However, the flaw in appellant's position is that the claims presently on appeal do not preclude the weighted refractory body of the reference. Hence, appellant's argument and declaration evidence are not commensurate with the subject matter within the scope of the appealed claims. Regarding appellant's argument that the claimed relationship between center of gravity and center of buoyant support is not described in the reference, we adhere to the reasoning articulated by the Board in the grandparent application, i.e., since the inhibitors of both appellant and Koffron have a specific gravity which buoyantly supports the inhibitor at the interface of the molten metal and slag layers, it follows that the center of gravity of the reference inhibitor is below its center of buoyancy in order to achieve the claimed feature that the "body generally conforms with the shape of the vortex

substantially along its entire length" (claim 1 of reference). Again, it is of no moment that the refractory body of Koffron must be appropriately weighted and shaped in a non-tetrahedral configuration in order to attain the disclosed operation, since such weighted non-tetrahedral bodies are within the scope of the appealed claims. Moreover, to the extent it can be argued that there is some unspecified distinction between the claimed geometrically proportioning and shaping and the proportioning and shaping employed by Koffron, we agree with the examiner that it would have been obvious for one of ordinary skill in the art to determine the shape of the refractory body that results in its center of gravity being below its center of buoyant support such that the shape of the body generally conforms with the shape of the vortex. Furthermore, assuming that one of ordinary skill in the art would not have appreciated that the non-tetrahedral bodies of Koffron have their center of gravity below their center of buoyant support, this relationship would have naturally ensued from shaping a refractory body in accordance with the teachings of Koffron.

We also agree with the examiner that it would have been obvious for one of ordinary skill in the art to roll the refractory body into position, as required by claims 12 and 18. In our view, it would have been obvious for one of ordinary skill in the art to roll Koffron's specifically disclosed octagonal pyramid body, with the understanding that it would have been obvious to round off the eight edges of the body to prevent damage thereto. Since rolling was admittedly known in the art as a way of introducing spherically shaped vortex inhibitors, it would have been obvious for one of ordinary skill in the art to modify the octagonal pyramid body of Koffron in the manner of appellant to facilitate rolling the body into position.

In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claims is affirmed.

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

AFFIRMED

EDWARD C. KIMLIN)
Administrative Patent Judge)

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CAMERON WEIFFENBACH	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
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