

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOSHIO KAWAMURA, KAZUhide KAWAI
and SHIGEKI NIWA

Appeal No. 95-2647
Application 08/068,105¹

ON BRIEF

Before SOFOCLEOUS, KIMLIN and WEIFFENBACH, *Administrative Patent Judges*.

WEIFFENBACH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-19, which are all of the claims in the application. We reverse.

The Claimed Subject Matter

¹ Application for patent filed May 28, 1993.

The claims on appeal are directed to a refractory slide-gate to control the flow of molten metal from the bottom of a ladle or tundish. Claim 1, 5 and 6 are representative of the claimed subject matter and read as follows:

1. A refractory slide-gate plate having a nozzle hole through which molten metal flows in and out and an inert gas supply groove for supplying inert gas into the nozzle hole, comprising:

a refractory base plate which is designed in a ring shape;

a refractory plate member which is fixedly engaged with the inside of said ring-shaped refractory base plate to be integrated with said refractory base plate, the inert gas supply groove being formed on an inner peripheral portion of said ring-shaped refractory base plate,

wherein said inert gas supply groove is formed on a slide surface of said refractory slide-gate plate.

5. The refractory slide-gate plate as claimed in claim 1, wherein said inert gas supply groove is designed in 2 to 20 mm width and in 2 to 20 mm depth.

6. The refractory slide-gate plate as claimed in claim 1, wherein said refractory plate member is formed of Al_2O_3 - ZrO_2 -C-based refractory material or ZrO_2 -based refractory material.

References of Record

The following references of record are relied upon by the examiner as evidence of obviousness:

Shapland et al. (Shapland) ²	4,545,512	Oct. 8, 1985
Arakawa et al. (Arakawa)	4,583,721	Apr. 22, 1986
Russo	5,004,131	Apr. 2, 1991

² The copy of the Shapland patent of record in the present application at the time of the appeal was incomplete in that it does not include any of the drawing figures. We have obtained a complete copy of the patent and it is attached to this decision. Any reference to the Shapland patent in this decision is directed to the complete copy of the patent.

The Rejections³

Claims 1-4 and 14-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shapland in view of Russo.

Claims 1-19 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shapland in view of Russo and further in view of Arakawa.

Grouping of Claims

Appellants have stated that the rejected claims do not stand or fall together and has grouped the claims as follows (brief, p. 3):

Group I: Claims 1-4 and 14-17 which are directed to the basic refractory slide gate plate comprising a refractory plate member and a refractory base plate which includes an inert gas supply groove.

Group II: Claims 5, 7-9 and 18 which add to Group I the width and depth of the gas supply groove.

Group III: Claims 6, 10-13 and 19 which define the refractory plate member set forth in Group I as being formed of Al₂O₃-ZrO₂-C-based refractory material or a ZrO₂-based refractory material.

Opinion

We have carefully considered the respective positions advanced by appellants and the examiner. However, for the reasons set forth below, we will not sustain either of the the examiner's rejections.

³ The final Office action included a third rejection, a rejection of claims 1-4 and 14-17 under 35 U.S.C. § 103 as being unpatentable over either Russo <131 (U.S. Patent No. 5,004,131) or Russo <034 (U.S. Patent No. 5,100,034). Appellant was advised by the examiner in an advisory action (paper no. 13) that this rejection has been withdrawn.

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The claimed subject matter is directed to a refractory slide-gate plate for a slide gate device which is connected to a ladle or a tundish used in a molding process for molten iron or steel. The slide gate device comprises two basic parts, a refractory fixed plate and a refractory slide-gate plate, each having a nozzle hole. When it is desired to cause the molten iron or steel to flow from the ladle or tundish, the nozzle hole of the slide-gate plate is moved by a manipulating drive member into alignment with the nozzle hole in the fixed plate. Appellants' invention is related to only the structure of the refractory slide-gate plate.

Before we can apply the prior art, we must first define the metes and bounds of the claimed device. It is well settled that claim language must be read in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983); *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

Claim 1 defines the refractory slide-gate plate as comprising a refractory base plate having a "ring shape" and a refractory plate member which is "fixedly engaged with the inside of said ring-shaped refractory base plate to be integrated with said refractory base plate." Appellants have not defined, in words, a "ring-shaped refractory base plate," but illustrate in Figs. 2-7 a base plate **11** which has a recessed portion which has a ring shape. Inside this ring shaped portion is the refractory plate member **13** which appears to be fixed to base plate **11** by material **15**.⁴ According to claim 1, an inert gas supply groove is "formed on an inner peripheral portion of said ring shaped refractory base plate." In light of

⁴ We note that appellants have not identified or defined material **15** in the specification. Upon return of this application to the examiner, the examiner should consider whether the disclosure is enabling under the first paragraph of 35 U.S.C. § 112 without material **15** having been identified or defined in the specification.

appellants' specification, we interpret this to mean that a groove is formed at the peripheral portion of the recessed portion of base plate **11** forming the ring and that the groove is formed between the peripheral portion of the recessed portion of base plate **11** and the plate member **13**. Claim 1 further defines the inert gas supply groove for supplying inert gas into the nozzle hole as being on the slide surface of the refractory slide gate plate. We interpret this as meaning that the groove is located on the surface of the plate which faces a fixed portion of the slide gate device.

The examiner rejected claim 1, *inter alia*, under 35 U.S.C. § 103 over the combined teachings of Shapland and Russo. According to the examiner, Shapland shows a slide-gate device comprising, *inter alia*, a refractory ring shaped base plate **18**, a refractory plate member **112**,⁵ and an inert gas supply "groove" formed therebetween, presumably narrow closed passage **174** between base plate **18** and plate member **112** through which an inert gas can be passed. We find that Shapland's narrow passage **174** is not a groove on the surface of the element defined by base plate **18** and plate member **112** as required by appellants' claim 1.

The examiner relies on Russo as teaching that "in order to advantageously prevent infiltration of air into the orifices of slide gate plates it is known to provide a groove reaching the sliding surface of the slide gate plate connected to a non-oxidizing gas source and surrounding the orifice" (answer: p. 3). The examiner concludes that "[b]ecause Shapland et al would also benefit from reduced oxidizing air infiltration,

⁵ The examiner relied on Fig. 1 of Shapland in his rejection. However, Fig. 1 of Shapland does not have reference numeral **112**. Fig. 2 of Shapland appears to be more appropriate for identifying the elements identified by the examiner.

motivation to employ the groove structure of Russo ¶131 in the gate of Shapland et al would have been obvious to one of ordinary skill in the art at the time the invention was made” (answer: pp. 3-4). While we agree with the examiner that a person having ordinary skill in the art would have been motivated by Russo to modify Shapland by adding a “groove” on the fixed element of Shapland to reduce air infiltration, the examiner has not explained how and why such a person would have been led to form the “groove” between Shapland’s base plate **18** and plate member **112** as required by appellants’ claims. Moreover, in Russo, the supply groove is not formed on the sliding gate plate, but is formed on the fixed plate (col. 1, lines 43-52). The examiner has not explained why a person having ordinary skill in the art would have been led by the teachings of Shapland and/or Russo to locate the “groove” on the surface of the sliding gate as opposed to the fixed element of the valve. The examiner’s argument that “[t]here is no requirement in the claims that the plate [claimed] be a movable plate of the sliding gate valve ...” (answer: pp. 5-6) is without merit since appellants’ claims are specifically directed to a “refractory slide-gate plate” which has the inert gas supply groove on the surface thereof (emphasis added).

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For the foregoing reasons, the examiner's rejection of claims 1-4 and 14-17 under 35 U.S.C. § 103 over Shapland and Russo is reversed for failure to establish a *prima facie* case. Since the teachings of Arakawa are not seen to make up for the deficiencies of Shapland and Russo, we also reverse the examiner's rejection of claims 1-19 under 35 U.S.C. § 103 over Shapland, Russo and Arakawa. Accordingly, the decision of the examiner is reversed.

REVERSED

MICHAEL SOFOCLEOUS)
Administrative Patent Judge)
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)
) BOARD OF PATENT
EDWARD C. KIMLIN)
Administrative Patent Judge) APPEALS AND
)
) INTERFERENCES
)
CAMERON WEIFFENBACH)
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