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INGOT MOLD COATING

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1 Claim. (Cl. 22—189)

This invention relates to ingot molds which are used to receive molten metal as it is teemed from a ladle, and more particularly to coatings for said ingot molds.

In the commercial production of steel, it is customary to teem the molten metal from a large ladle into a number of aligned ingot molds having vertical matrices. While some ingot molds are of the "bottom pour" type, the vast majority is of the "top pour" type.

In top pour ingot molds, the molten metal is directed in a stream from either the top or bottom of the ladle (as the case may be) and impinges upon the bottom of the mold matrix, which is either formed by the bottom of the mold itself or by a stool or other closure. This inevitably results in splashing of the molten metal against the sides of the mold matrix with the result that the surface of the ingot cast therein is characterized by an uneven condition variously known in the art as "scabs," "splashes," "slivers," "cracks," "pits," "laps," and other descriptive names. This condition results in extremely rapid chilling of the splashed molten metal and adherence thereof to the sides of the mold matrix, whereby surface defects are formed.

Another objectionable feature in the top pouring of ingot molds is caused by an oxidizing condition resulting in an uneven ingot surface identified in the art as "blow holes," "tears," "seams" and "alligator hide."

These surface defects are sometimes removed by chipping, which is a costly operation; but in most cases all of the surface defects cannot be completely removed. It is well understood that any surface defects in the ingot will result in surface defects in the finished product obtained therefrom.

In order to overcome the disadvantages resulting in the splashing of the teemed molten metal against the sides of the mold matrix, and in order to provide a better surface condition in general, numerous coatings have been proposed. One type which may in general be termed "splash repelling" includes such materials as tar, graphite, molasses, brine and anhydrous borax. Another type of coating may be termed "reducing" in nature and results in a lessening in ingot pits which, in turn, reduces the number of cracks and seams in the finished product. The most prevalent material used for a coating of the reducing type is aluminum, although there may be used other materials, such as powdered ferromanganese and powdered silicon applied as a wash with a suitable carrier, such as linseed oil and turpentine.

It is believed readily apparent that each of the two types of mold coatings confers definite benefits which are not inherent in the other. Some workers in the art have endeavored to obtain the joint benefits by combining materials of the two types and using it in the form of a single medium, but my investigations have definitely shown the same to be unsatisfactory.

It is among the objects of the present invention to eliminate or materially reduce surface defects which are carried from the ingot to the finished product obtained therefrom.

Another object is the provision of a mold coating which is extremely efficient in the elimination or material reduction of surface defects in ingots and one which is, at the same time, cheap and easy to manufacture and use.

The invention, then, comprises the features hereinafter fully described and as particularly pointed out in the claim, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative of several of the number of ways in which the principles of the invention may be employed.

According to the teachings of the present invention, the ingot mold is first coated with a splash repelling medium, such as tar, of a composition which is conventional in the art of mold coatings. On top of this coating there is applied a coating of a medium which is reducing in nature, such as aluminum paint, the composition of which is entirely conventional in the art of ingot mold coatings.

I have found that the greater the degree of availability of the reducing medium, because of its being in direct contact with the molten steel rather than dispersed throughout a mixture, the more rapid and more efficient deoxidation of the steel at the mold surface with a resultant elimination or material decrease in small surface blow holes.

The aluminum is the active agent for deoxidation and in the case of a "double" mold coating with the aluminum as the outside coating, it is more readily available for the deoxidation of the steel which must occur almost instantaneously in order to eliminate blow holes.

It will be readily understood by those skilled in the art that the invention contemplates the use of an original coating which is splash repelling in nature whether tar or otherwise; and the application thereto of a coating having a reducing action is not limited to aluminum.

While I have described certain specific embodiments of the present invention, it will be seen that I do not wish to be limited exactly thereto since various modifications may be made without departing from the scope of the invention, as defined by the following claim.

I claim:

An ingot mold coating comprising an original layer of tar, and a superposed coating of aluminum paint.

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