

1

3,686,013

## TREATMENT OF INGOT MOULDS

John Edward Williams, 285 Long Acre, Nechells,  
Birmingham 7, England

No Drawing. Filed Mar. 8, 1971, Ser. No. 122,094  
Claims priority, application Great Britain, Mar. 19, 1970,  
13,374/70

Int. Cl. B29c 1/04

U.S. Cl. 117—5.1

3 Claims

### ABSTRACT OF THE DISCLOSURE

Ingot mould bases are protected by a bottom plate dressing applied by placing a heat rupturable bag of the liquid dressing on the hot base of the mould.

This invention relates to the treatment of ingot moulds.

In the casting of molten metal to form ingots, a stream of molten metal is poured, often from a height of several metres, into an ingot mould. The molten metal impacting on the base of the mould, or on the base or bottom plate of a two-piece mould, tends to give rise to undesirable erosion, particularly, in the case of steel.

In the past, many methods have been proposed for protecting such ingot mould bases or bottom plates, to lengthen their life and so avoid wastage. One method which has been employed in widely different forms is to place a shock absorbent mat, pad or cushion on the base of the mould, made for example, of metal, or of a material which, under the heat of the molten metal, will melt to form a casting flux. These methods are simple to effect, though often costly, but they do not always give the protection required, and they have the disadvantage that the pad can easily be displaced by the initial impact of the molten metal stream. A second method which has gained widespread acceptance is that of coating the base or bottom plate, prior to teeming molten metal into the mould, with a refractory coating. Generally, this takes the form of a suspension of refractory particles in water, together with a binder. The coating is brushed, sprayed or otherwise applied to the base or bottom plate, and also, if desired, to other parts of the ingot mould interior, and then dried down by evaporation of the liquid vehicle, usually due to residual heat in the mould to give a thin coherent coating which is not wet by the molten metal.

While this second method generally leads to improved results and longer mould life, it is disadvantageous as requiring the provision of equipment for effecting the coating, this equipment requiring time to operate, frequent cleaning and maintenance, and constituting an additional piece of equipment necessarily present in the casting works.

It has now been surprisingly found that ingot mould bases or bottom plates may be protected by placing on the base, prior to teeming molten metal into the mould, a quantity of liquid coating composition contained in an easily heat fracturable container.

Thus, according to the present invention there is provided a method of preparing in ingot mould which comprises locating, on the hot base of the mould, a quantity of liquid bottom plate coating composition contained in an easily heat-rupturable container, whereby the container ruptures, allows the liquid coating composition to spread to an even thickness and dry to a dry layer, prior to the commencement of teeming molten metal.

2

The base of the mould may possess sufficient residual heat from the previous casting cycle to effect the necessary rupture of the container and drying out of the composition; alternatively, it may be preheated.

The bottom plate coating composition may be any of those known for such use. Particularly preferred are those of the type described in British specification No. 1,128,816, and those described in copending application U.S. Ser. No. 18,702 filed Mar. 11, 1970, now abandoned.

The quantity of coating material used is preferably that which would give a dry coating of thickness 0.4 to 2.0 mm. on the mould base.

The preferred heat-rupturable container is a plastics bag, e.g. of polyethylene. The invention is of particular value with recessed ingot mould base plates, in which the recess acts to hold a pool of the bottom plate dressing.

The following example will serve to illustrate the invention:

### EXAMPLE

A polyethylene container having a wall thickness of 50 microns and nominal overall dimensions of 17.5–12.5–5 cms., holds sufficient coating composition to effect a lining of 1 mm. thickness in the recessed area of a recessed ingot mould base plate. The recess has the following dimensions: 20 x 20 cms. and is approximately 10 cms. deep. The sides of the recess are inclined to an angle of 45° from the horizontal plane of the base plate.

In use the container is placed in the recess of the base plate which is at a temperature of 300° C. from a previous casting. The container melts and the composition flows, and spreads evenly over the flat area of the recess and along the inclined walls. After casting it was observed that the ingot stripped cleanly from the base plate. Visual inspection showed that the coating had wholly withstood the erosive action of the molten metal protecting the plate.

I claim as my invention:

1. In a method of protecting the base of an ingot mould by applying a liquid dressing to the base and drying the dressing, the improvement comprising heating the base, locating on the heated base a quantity of liquid dressing contained in an easily heat-rupturable container whereby the container ruptures to allow the liquid dressing to spread to an even thickness on the base.

2. A method according to claim 1 wherein the heat-rupturable container is a plastic bag.

3. A method according to claim 1 wherein the amount of liquid dressing applied is sufficient to give a dry coating of thickness 0.4 to 2.0 mm. on the base of the mould.

### References Cited

#### UNITED STATES PATENTS

1,621,615	3/1927	Wikle	117—5.1
1,630,612	5/1927	Gathmann	117—5.1
2,343,842	3/1944	Hatcher	117—5.1
3,364,040	1/1968	Griss	106—38.23
3,428,464	2/1969	Pollard	106—38.23

#### FOREIGN PATENTS

1,128,816	10/1968	Great Britain	117—5.1
-----------	---------	---------------	---------

WILLIAM D. MARTIN, Primary Examiner

M. R. P. PERRONE, Jr., Assistant Examiner

U.S. Cl. X.R.

117—5.2, 5.3, 66, 120; 164—120, 267; 249—115

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,686,013 Dated August 22, 1972

Inventor(s) John Edward Williams

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

┌ In the Heading, column 1, line 4, after the word England, insert the words --- assignor to Foseco International Limited, Birmingham, England, a company of Great Britain. --- ┐

Signed and sealed this 1st day of May 1973.

(SEAL)  
Attest:

EDWARD M. FLETCHER, JR.  
Attesting Officer

ROBERT GOTTSCHALK  
Commissioner of Patents