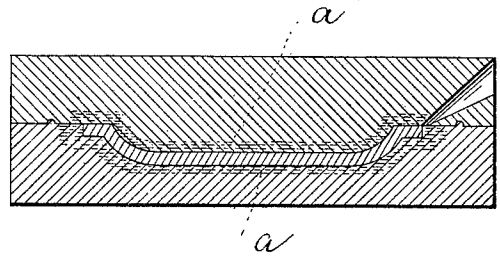
No. 697,972. Patented Apr. 22, 1902.

G. H. BRABROOK.

METHOD OF PRODUCING SOFT METAL CASTINGS.

(Application filed Aug. 27, 1901.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE HALE BRABROOK, OF TAUNTON, MASSACHUSETTS.

METHOD OF PRODUCING SOFT-METAL CASTINGS.

SPECIFICATION forming part of Letters Patent No. 697,972, dated April 22, 1902.

Application filed August 27, 1901. Serial No. 73,508. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE HALE BRABROOK, of Taunton, county of Bristol, and State of Massachusetts, have invented an Improvement in Methods of Producing Soft-Metal Castings, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

The present invention relates to a process of making castings from soft metal, such as Britannia metal or similar alloys composed mainly of tin or of lead.

It has been found impracticable to make thin castings from britannia metal in the ordinary method of running the molten metal into a mold, because the metal will not sufficiently retain its fluidity, but by reason of chilling or oxidation ceases to flow, and thus fails to fill the mold, so as to obtain perfect castings, especially where the article to be produced is of considerable extent, but of relatively small thickness or body, as is the case with hollow articles for tableware and the like, which are commonly made in whole or part from such alloys, but which are usually manufactured by working up the sheet metal, because of the practical impossibility of producing satisfactory castings.

The present invention is based upon the discovery that a vegetable-fat acid, if properly applied to the molten metal in the mold, will increase its fluidity, probably by preventing or diminishing the oxidation, and will cause the metal to flow in such manner as properly to fill all parts of the mold.

The invention consists in exposing the molten metal to the action of a vegetable-fat acid when running the metal into the mold, the said mold being composed of porous or absorptive material and having the portion forming and adjacent to the inner or mold surface coated or impregnated with the acid.

I have found that good results are to be obtained by the use of palmitic acid, as contained, for example, in the substance commercially known as "Japan wax;" but the invention is not limited to the process in which this particular substance is used, as other vegetable-fat acids will give good results, although I have found the Japan wax to be probably the best, as it is especially rich in palmitic acid.

The accompanying drawing illustrates a mold in cross-section properly treated or prepared for the purposes of this invention.

A mold for casting soft metal in accordance with this invention may be constructed in any usual manner, being made of porous absorptive material, such as plaster-of-paris or baked molding-sand, and in order that the metal may be properly subjected to the action of the vegetable-fat acid in the casting operation the inner surface of said mold is coated or impregnated with the fat acid. This may be done by warming or slightly heating the parts of the mold, so as to dry the same thoroughly, and then applying vegetable-fat acid to the inner surfaces of the mold, that are to come in contact with and give form to the metal. The acid material will thus fill and impregnate the material of the mold adjacent to its internal surface, as indicated at *a*, without affecting or changing the form of said surface and will act on the molten metal, which may be poured into the mold in the usual manner, and will cause the fluidity of the metal to be retained, so that it will readily flow and completely and perfectly fill the cavity of the mold, thus resulting in the production of a sound and homogeneous casting having a highly-finished surface.

The behavior of the metal as the result of the process indicates that some chemical action takes place between the hot metal alloy and the acid, this action probably involving the liberation of hydrogen, which prevents or retards the oxidation of the metal, which takes place when the metal is not so treated, and results in the solidifying or partially solidifying of the metal, so that it will not flow and properly fill the cavity of the mold.

It is found in practice that a single coating of the fat acid will enable a mold to be used for several castings, and when it becomes insufficient to cause the metal to flow properly the mold may be supplied with a fresh coating of the material and again used until the effect thereof is exhausted.

Of the vegetable-fat acids tried in the exploitation of this invention, palmitic acid as contained in the material commercially

known as "Japan wax" has been found most efficient; but it is within my invention to use other vegetable-fat acids. Furthermore, by the term "soft metal" as herein employed I mean to include britannia, alloys of tin and lead, and similar metals or so-called metals or metallic compositions.

I claim—

1. The method of producing a casting of soft metal, which consists in impregnating the inner surface of a porous non-metallic mold with a vegetable-fat acid and running in the molten metal.

2. The method of producing a casting of soft metal, which consists in impregnating the inner surface of a porous non-metallic mold with palmitic acid as contained in the substance known as Japan wax, and running in the molten metal.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE HALE BRABROOK.

Witnesses:

HENRY J. LIVERMORE,

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