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CASTING COPPER AND COPPER ALLOYS

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3 Claims. (Cl. 22—189)

This invention relates to improvement in casting copper or copper alloys and is of particular importance in casting oxygen-free and deoxidized copper or copper alloys, such as brass, bronze, nickel silver and the like, which contain more than 50% copper.

In accordance with the invention, oxygen-free or deoxidized copper or copper alloys are cast into suitable molds previously coated with an improved mold dressing which though sufficiently adherent to impart a uniform coating to the mold contains only a minimum of volatile constituents with the result that sound and smooth surfaces are imparted to the cast metal.

The improved mold dressing contemplated by the invention comprises a mixture of an inert substance selected from the class consisting of bone ash, bone black and graphite or combinations thereof and a suitable adhesive constituent, such as rosin, copal, gum arabic, gum tragacanth, rosin pitch, glue, gelatin or the like, dissolved in a suitable low boiling, highly volatile solvent, as, for example, denatured alcohol. For instance, I have obtained highly beneficial results from a mixture comprising one gallon of alcohol, three pounds of bone black or bone ash and one pound of rosin, although it will be readily appreciated by those skilled in the art that these proportions may be varied within reasonable limits or other constituents substituted therefor.

In practicing the invention, the improved mold coating may be applied to the surfaces of the mold in practically any manner, as, for example, spraying or washing the mold with the dressing, although I prefer to employ a sheepskin mop. Upon applying the coating to the mold, the volatile solvent evaporates and leaves a smooth uniform coating of the inert material which is held in place by the adhesive constituent. The deoxidized or oxygen-free copper or alloys thereof may then be cast in the mold and upon removal will be found to be sound and to have smooth even surfaces.

The present invention provides many advantages over the common methods of casting copper heretofore employed. For example, the common practice has been to cast copper into molds coated with a mixture of bone ash or bone black and water. While such a method gives more or less satisfactory results when casting ordinary grades of electrolytic copper, the procedure is far from satisfactory when applied to the casting of oxygen-free or substantially oxygen-free copper or copper alloys, such as brass, bronze or the like containing more than 50% copper, as these metals and alloys wet and wash off such a mold coating which results in the production of defective and unsound castings. These defects are eliminated practically in toto by the present invention.

Again, it has heretofore been common practice to cast deoxidized copper and the like into molds coated with oil dressings generally comprising any of various oils and graphite or other forms of carbon. This practice is, however, defective in that surface defects are not uncommon and porosity is imparted to the casting. By the invention sound and non-porous castings are produced and it is believed the improved results are due in a large part to the elimination of gases which in the oil dressing were liberated and permeated the metal being cast. As illustrative of the soundness of castings obtainable by the present invention, deoxidized copper billets having a specific gravity of between 8.90 and 8.95 have been regularly produced.

Another advantage of the present invention over the process in which oil coatings are utilized resides in the fact that lower pouring temperatures may be employed. This is true because, in the case of oil dressings, it is necessary to employ relatvely high casting temperatures to allow the gases liberated to escape from the molten metal. The present invention by reducing the amount of volatile constituent to a minimum renders these higher casting temperatures unnecessary.

A further advantage is the marked decrease in mold temperatures permitted by the invention. By using a low boiling point, highly volatile solvent, a dry adherent mold coating is quickly obtained at relatively low temperatures, for example 125° F., as compared to mold temperatures of 175° F. or more which are usually necessary with water mixtures and the like. It has been found that these lower mold temperatures result in improved surfaces being imparted to the castings.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. The improvement in casting deoxidized and oxygen-free copper and alloys thereof which comprises casting the metal in a mold previously coated with a dressing consisting of an inert substance selected from the group comprising bone ash, bone black and graphite, a resinous

adhesive constituent and a low boiling point, highly volatile solvent.

2. The method of producing sound and smooth castings of deoxidized and oxygen-free copper or copper alloys which comprises coating a mold with a mixture of an inert substance comprising any of bone ash, bone black and graphite and a suitable adhesive resin dissolved in a low boiling point solvent such as denatured alcohol, allowing the solvent to evaporate leaving a uniform coating on the surfaces of said mold and thereafter casting said copper in said mold.

3. An improved mold dressing for coating molds used in casting deoxidized and oxygen-free copper in the approximate proportions of three pounds bone ash or bone black and one pound rosin dissolved in one gallon of alcohol.

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