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MOLD FACING

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This invention relates to casting molds adapted for repetition casting operations.

If a metal mold is used for cast iron castings, it is necessary to employ a non-chilling iron to obtain a casting of gray structure. A non-chilling iron may be defined as having a gray structure when poured against a surface that has high heat conductivity, and a chilling iron may be defined as having a white structure when poured against a surface that has high heat conductivity. Efforts have been made for many years to produce a filling material or a coating for a metal mold which will permit the use of a chilling iron in a repetition mold to produce castings having a gray structure but I do not know of any filling material that has proven satisfactory and while it is known that a coating may be used for this purpose, the results are not satisfactory commercially because no coating has yet been produced having the necessary durability for repetition casting.

I have discovered a material which can be used as a filling material for repetition casting in metal molds with chilling iron and producing castings having a gray structure; and which can also be used as a coating for the same purpose, the coating having a durability much greater than coatings which have heretofore been used and proposed. Where the material is applied in a thick section it will ordinarily be considered a filling and where it is applied in a thin section it will be considered a coating; but it will be understood that a filling or a coating may be thick or thin as conditions may require and therefore they may be considered fair equivalents in reference to this invention and application.

I have found that a mixture of a material of low heat conductivity, such as mineral wool, and a suitable binding material, such as zinc oxide, makes a durable and efficient insulating material for the mold cavity walls of iron repetition molds to permit the use of a chilling iron with the production of castings having a gray structure. Mineral wool is transformed rock and has a great many air cells which give it the quality of low heat conductivity. I prefer to use these materials in or about the proportions of 60% mineral wool and 40% zinc oxide although it has been found that the proportions may be varied to satisfy different conditions with only the expected and corresponding variations in results. The mineral wool is ground to approximately 20 mesh and then mixed with powdered zinc oxide and water to form a paste. The surface of the mold to receive the filling or coating is preferably warmed and then the material is applied to the surface as a filling or as a coating by any means suitable for the purpose. If the material is to be applied as a filling, the mold cavity wall will be recessed or depressed to receive the material which may be troweled therein to substantially fill the recess or depression. This filling is allowed to set for a sufficient length of time during the mold is heated slowly for several hours to a temperature of about 400° or 500° F. until practically all of the moisture in the filling has been evaporated. Then a thin coating of the material may be applied by any suitable means to the filling to bring the mold cavity walls to proper dimensions and form a molding surface. I have found it satisfactory to use a material consisting of mineral wool and zinc oxide as heretofore described but I may use any equivalent material having a cellulose structure and any heat-resisting binding material suitable for the purpose. A finish coating of graphite and water may be applied to the surface of the mold cavity, if desired, to reduce the friction of the casting against the molding surface when the casting is removed from the mold. This graphite coating is preferably applied to the surface of the mold cavity after each casting operation. If any portion of the mineral wool, filling or coating material at the surface of the mold cavity becomes damaged, it may be repaired by using the mixture and graphite coating. But I have found in practice that a filling or a coating of mineral wool material seldom requires repairing and any repairing that is required can be done readily by the mold operator without removing the mold from the foundry.

While the object of the invention is to pro-

vide a material for the wall of the mold cavity which will permit the use of chilling iron in a repetition mold to produce castings having a gray structure which can also be used advantageously in casting with non-chilling iron and with other materials. Some castings are required to be made with certain portions having a gray structure and other portions having a white structure. In such cases the filling or coating material will only be used at that part of the mold cavity where the casting is to have a gray structure. The thickness of the filling or coating material depends upon the nature of the filling iron to be poured in the mold. If an iron is used that takes an excessive chill it will be necessary to use a greater thickness of filling material but if a low chilling iron is used the thickness of the material may be reduced accordingly.

My invention provides a material which can be easily applied by a trowel, a brush or other suitable means in the form of a filling or a coating to produce a molding surface of high heat conductivity, comparable with a sand mold, to enable a chilling iron to be used in repetition molding operations in an iron mold and produce castings having white structure. The entire surface of the mold cavity may be formed of this material or only portions thereof, and in the latter case the portions of the castings opposite the molding surface will have a white structure. The use of my invention will materially reduce the cost of casting operations as compared with such operations in sand molds and since the material provides a strong and durable molding surface the cost of maintaining the molds in proper operative condition will also be materially reduced.

I claim:

1. A facing for molds to be used in casting ferrous metals comprising a mixture of mineral wool as the principal ingredient and a binding material.

2. A facing for molds to be used in casting ferrous metals comprising a mixture of ground mineral wool as the principal ingredient and a binding material.

3. A facing for molds to be used in casting ferrous metals comprising a mixture of ground mineral wool as the principal ingredient and a powdered binding material.

4. A facing for molds comprising a mixture of ground mineral wool and powdered zinc oxide.

5. A facing for molds comprising a mixture of ground mineral wool and powdered zinc oxide in the proportions of 60% mineral wool and 40% zinc oxide.

6. A facing for molds comprising a mixture of a fibrous material of low heat conductivity and zinc oxide.

7. The method of forming a mold facing which comprises recessing the mold and filling the recess with a mixture of ground mineral wool, powdered zinc oxide and water and drying said mixture.

8. The method of forming a mold facing which comprises recessing the mold and filling the recess with a mixture of ground mineral wool, powdered zinc oxide and water, drying said mixture, and then applying a finish coating of the same material thereover.

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