Patented May 13, 1941

2,241,594

UNITED STATES PATENT OFFICE

2,241,594

MOLD DRESSING

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No Drawing. Application December 18, 1939, Serial No. 309,826

12 Claims. (Cl. 22—189)

The present invention relates to improvements in mold dressings and in particular to improvements in non-ferrous metal mold dressings.

In the preparation of metal ingots the molten metal is poured into molds and permitted to solidify. To prevent the adhesion of the metal to the walls of the mold it is the general foundry practice to apply a so-called "dressing" to the interior surface of the mold. The mold dressing must be a material which adheres to the surface of the mold prior to and throughout the pouring period and must volatilize at a sufficiently high rate after the molten metal comes in contact with the dressing to assure complete evolution of the gases formed before the metal solidifies. If the latter property is not present the solidified metal will be porous. Furthermore the dressing vehicle must not leave a substantial dislodgable residue upon evaporating since this residue, mainly carbonaceous matter, floats to the surface of the solidifying ingot and forms what is known as a "dirty ingot." This is highly undesirable when working with non-ferrous metals such as brass, bronze and other copper bearing metals since it necessitates the cutting up of the ingot in order to eliminate the dirty portion.

Mold dressings heretofore employed have consisted essentially of a mixture of lard oil and graphite having a pasty consistency. In some instances a diluent such as kerosene has been employed with the lard oil-graphite mixture. Attempts to utilize petroleum oils in place of the lard oil have not heretofore been successful.

The primary object of the present invention is to provide a mold dressing utilizing a petroleum oil vehicle. Another object of the invention is to provide an improved mold dressing which will adhere to the sides of the mold throughout the pouring operations. Still another object of the invention is to provide a petroleum oil vehicle for mold dressings which will volatilize at a sufficiently high rate after the molten metal contacts the dressing to assure complete evolution of the gases formed before the metal solidifies. A further object is to provide an improved petroleum oil vehicle for mold dressing which will not leave a substantial residue upon evaporation. Other objects and advantages of the invention will become apparent from the following description thereof.

We have discovered that the foregoing objects can be attained by employing as the vehicle for mold dressings a refined mineral oil of the correct volatility characteristics and low carbon residue compounded with from about 1% to about 25% and preferably from about 4% to about 10% of naphthenic acid and/or a naphthenic acid derivative. The mineral oil employed is preferably one having approximately the following characteristics:

Saybolt Universal viscosity at 100° F.	seconds	100 to 300
Flash point	°F	375 to 450
Conradson carbon (maximum)		0.5

The petroleum oil employed in addition to having the above characteristics should preferably be a narrow cut fraction. By this we mean the oil should not be one in which a high viscosity oil is blended with a low viscosity oil to obtain a blended oil having the desired viscosity falling within the above viscosity range.

Although for summer use the pour point of the oil is unimportant, for winter use it is highly desirable to use an oil having a maximum pour point of about 35° F. If necessary a suitable pour point depressor, such as Pourex, described in U. S. Patents 1,963,917 and 1,963,918, may be added to lower the pour point of the oil.

The naphthenic acids employed may be obtained from any source although we prefer to employ naphthenic acids obtained from petroleum oils. The naphthenic acids may be recovered from petroleum oils either by treating the oils with aqueous alkali at elevated temperatures, acidifying the separated or extracted solution of alkali naphthenates, extracting with a low boiling solvent and separating the acid by fractional distillation, or the oil may be distilled in the presence of an alkali and the resulting soap recovered by extraction with alcohol of about 80% strength. Other methods are described in Ellis "The Chemistry of Petroleum Derivatives," vol. 2, page 1104 et seq. In place of the naphthenic acids we may use the soaps of naphthenic acids, particularly the alkali metal soaps such as sodium naphthenate or potassium naphthenate, although the alkaline earth metal and the heavy metal soaps of naphthenic acids also may be employed.

In preparing the mold dressing the compounded oil is mixed with from about 15% to about 40% graphite to form a paste or paste-like material which is applied to the interior surfaces of the mold.

The following formula is exemplary of a preferred composition employed in preparing brass mold dressings:

Naphthenic acids---------per cent--	4 to	10
Mineral oil----------do----	90 to	96
Mineral oil characteristics		
Saybolt Universal viscosity at 100° F----------seconds--	180 to	190
Flash (minimum)----------°F--		390

The above compounded oil is then mixed with from about 15% to about 40% of graphite or other suitable solid material such as for example whiting, vermiculite and the like, and the resulting paste applied to the mold.

Although our invention has been described by specific embodiments thereof it is not intended that these shall be regarded as limitations upon the scope of the invention, except insofar as included in the appended claims.

We claim:

1. A dressing for molds receiving a molten metal comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 100 seconds and about 300 seconds, a flash point of from about 375° F. to about 450° F., and a Conradson carbon of not more than about 0.5 and an added minor proportion of a compound selected from the group consisting of a naphthenic acid and a metal naphthenate.

2. A dressing for molds for casting non-ferrous metals comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 100 seconds and about 300 seconds, a flash point of from about 375° F. to about 450° F. and a Conradson carbon of not more than 0.5 and from about 1.0% to about 25% of naphthenic acid.

3. A dressing for molds for casting copper bearing metals comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 100 seconds and about 300 seconds, a flash point between about 375° F. and 450° F. and a Conradson carbon less than about 0.5, and a minor amount of naphthenic acid.

4. A dressing for molds as described in claim 3 in which from about 4.0% to about 10% of naphthenic acids are employed.

5. A dressing for molds for casting brass comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 180 seconds and 190 seconds, a flash point greater than about 390° F. and a Conradson carbon less than about 0.5, and from about 4% to about 10% of naphthenic acids.

6. The method of treating a mold preparatory to receiving a molten metal therein comprising applying to the interior surfaces of the mold a mold dressing comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 100 seconds and about 300 seconds, a flash point of from about 375° F. to about 450° F., and a Conradson carbon of not more than about 0.5 and an added minor proportion of a compound selected from the group consisting of a naphthenic acid and a metal naphthenate.

7. The method of treating a mold preparatory to receiving a molten non-ferrous metal therein, comprising applying to the interior surfaces of the mold a mold dressing comprising a mineral oil and from about 1.0% to about 25% of naphthenic acids.

8. The method of treating a mold as described in claim 7 in which the mineral oil of the mold dressing has the following approximate specifications:

Saybolt Universal viscosity at 100° F----------seconds--	100 to 300
Flash point----------° F--	375 to 450
Conradson carbon----------	Maximum of 0.5

9. The method of treating a mold preparatory to receiving a molten non-ferrous metal therein comprising applying to the interior surfaces of the mold a mold dressing comprising a mineral oil and from about 4.0% to about 10% of naphthenic acid.

10. The method of treating a mold preparatory to receiving molten brass therein comprising applying to the interior surfaces of the mold a dressing comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 180 seconds and about 190 seconds, a flash point greater than about 390° F. and a Conradson carbon less than about 0.5 and from about 4% to about 10% of naphthenic acids.

11. A dressing for molds receiving a molten metal comprising a compounded mineral oil, and a solid selected from the group consisting of graphite, whiting and vermiculite, said compounded oil comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 100 seconds and about 300 seconds and a flash point of from about 375° F. to about 450° F. and an added minor amount of naphthenic acids.

12. A dressing for molds for casting brass comprising a compounded mineral oil and from about 15% to about 40% graphite, said compounded oil comprising a mineral oil having a Saybolt Universal viscosity at 100° F. between about 100 seconds and 300 seconds and a flash point from about 375° F. to about 450° F. and from about 1.0% to about 25% naphthenic acids.

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