Patented Nov. 11, 1924. 1,515,150

UNITED STATES PATENT OFFICE.

LLOYD G. COPEMAN, OF FLINT, MICHIGAN.

PROCESS OF CASTING WITH PLASTIC MATERIALS.

No Drawing. Application filed March 14, 1923. Serial No. 625,123.

To all whom it may concern:

Be it known that LLOYD G. COPEMAN, a citizen of the United States, residing at Flint, in the county of Genesee and State of Michigan, has invented certain new and useful Improvements in Processes of Casting with Plastic Materials, of which the following is a specification.

This discovery relates to the casting of plastic materials and has special reference to the building of a finishing surface on an otherwise porous and coarse surface of a hardened plastic or concrete material. Various concrete preparations and cementitious compounds are now being used to manufacture articles of every day use and are being used for the linings of refrigerators and other containers. A very common preparation which is now being used for the lining of refrigerators and for casting other articles, is what is known as "oxo-chloride" cement. However, like all of these concrete preparations, the surface of the finished casting is rather rough and porous and it is necessary to either work this with a trowel or else to apply a finishing coat such as enamel.

In a co-pending application Serial No. 622,771, filed March 5, 1923, I have described and claimed what I believe to be a new process for casting plastic materials with an easily fusible spacing element between the hardening casting and the mold. With oxo-chloride cement and similar castings which expand in hardening, I find it almost necessary to use some kind of an element of this kind to secure the proper parting of the mold from the casting when the latter has hardened. I find the most useful element to achieve these results is paraffine.

The object of the present invention is to afford a process by which a finishing coat for the casting can be caused to adhere to the easily fusible spacing element and can also be properly united with the casting. I have found if a mixture of alcohol and gypsum, or alcohol and powdered plaster of Paris, be spread on to the paraffine lining and the alcohol allowed to evaporate, that it is possible then to apply a thin coating of the finishing element. This may be applied in the form of a mixture of water and plaster of Paris, water and gypsum, water and Portland cement, or any other material which sets and becomes hard. Preferably, the best method to proceed is to spray the coating material on first in a thin layer or film. This should be done carefully so as not to disturb the powdered gypsum or other element. When this has become dry and set, this is sufficiently hard so that further layers of the coating material may be spread on without a great deal of care and without disturbing the powder.

When the finishing coat has been allowed to dry and set on the paraffine lining, then I introduce the plastic substance that will form the main body of the casting. This is sometimes referred to as "mud", but more properly it is a concrete or cementitious substance that has the capacity of being mixed with water to form a plastic substance and to dry into a hard stony substance. No particular mixture or character of ingredients is necessary. So far as my improved process is concerned, it may be used in coating almost any substance that has the properties of being plastic and hardening in the way I have named. However, a substance with which I have experimented and have secured good results, is a substance that is now known to the trade as "oxo-chloride" cement.

The plastic material is introduced into the mold under great pressure, some 900 lbs. to the square inch. This forces the plastic material very closely together and compacts it and gives it greater tensile strength than is ordinarily present in stone castings. Furthermore, it drives the main body of the casting and the finishing coat closely together so that the finishing coat penetrates into the pores of the main body of the casting and a good finish for the casting is afforded. This coating has a hard smooth finsh well adapted to take a coat of enamel and the coating may be used as part of the interior stone lining of a refrigerator or for many other purposes.

In forming the claims I find it rather difficult to employ generic terms which will have an all-inclusive character to include a great many equivalents and at the same time, exclude a great many materials which would not be practical ingredients. For instance, in some of the claims I have used the term "mixture of alcohol and gypsum" to describe the initial coating or film which has when dry, the property of adhering to the parting element. Also in some of the claims I have referred to the material out

of which the parting element is made as "paraffine." In other claims I have referred to the coating material as a mixture of plaster of Paris. Now it will be obvious, that quite a few equivalents for these ingredients can be found in the way of substances having substantially the same properties of the ingredients mentioned for the purpose intended. Hence in those claims where it has been thought better to make the claim more definite by referring to the substances used, it will be understood that I use the name of the substances not in the sense of a strict limitation, but more in the nature of "words of description" naming a substance that has the suitable properties to be enlisted and intending the claim to cover equivalent substances, many of which I have already named in the specification.

In the claims I have spoken of applying the several films by spraying. Obviously, it might be possible to get measurably good results by other ways of applying the films, hence I want it understood that other equivalent ways are not excluded by reason of the wording of the claims.

It will be understood that by providing a suitable wooden core or core of similar material in the mold, that both the casting or the coating for the casting may form on the wooden core more in the form of a covering for a solid body, for instance, it is possible to cover an entire refrigerator door with a stone encasing by floating the door or the door frame in the mold as a core. Hence, I wish it understood that the process covers either the making of solid castings or the molding of a stone covering on another element.

What I claim is:

1. The process of casting plastic materials with a finishing coat, which comprises the lining of the mold with a parting material, the spraying of a wet film of material upon the parting element, said film having the property of adhering to the parting element when dry, the spraying of a second film of a coating material on said first film and allowing the same to set, then introducing a plastic cementitious or concrete material and allowing the whole casting to set and finally removing the mold.

2. The process of casting plastic materials with a finishing coat, which comprises the lining of the mold with a parting material, the spraying of a wet film of material upon the parting element, said film having the property of adhering to the parting element when dry, the spraying of a second film of a coating material on said first film and allowing the same to set, then introducing a plastic cementitious or concrete material under relatively great pressure, and allowing the whole casting to set and finally removing the mold.

3. The process of casting plastic materials with a finishing coat, which comprises the lining of the mold with paraffine, the spraying upon the paraffine of a liquid holding an ingredient in suspension and having the property of permitting the liquid to evaporate and leaving the suspended element adhering to the paraffine, then the spraying of a coating material upon the first named element and permitting the same to dry and set, then introducing a cementitious or concrete mixture in plastic condition and permitting the same to set, and finally removing the mold.

4. The process of casting plastic materials with a finishing coat, which comprises the lining of the mold with a parting film, the spraying upon said film of a mixture of alcohol and gypsum and permitting the same to dry, then the spraying upon the same of a finishing coat and allowing the same to dry and harden, then the forcing of a plastic material into the mold and allowing the same to dry and set, and finally removing the mold from the casting.

5. The process of casting material with a finishing coat, which comprises the lining of the mold with paraffine, the spraying of a mixture of alcohol and gypsum upon the paraffine and allowing the alcohol to evaporate, then the spraying of a film of a finishing material on the dry gypsum and permitting the same to set, finally the introduction of a plastic material into the mold and allowing the same to set, and finally removing the mold from the casting.

6. A process of casting material with a finishing coat, which comprises the lining of a mold with paraffine, the spraying of a mixture of alcohol and gypsum upon the paraffine and permitting the alcohol to evaporate, the spraying of a film of finishing material on the same and permitting the same to dry and set, again spraying a coat of finishing material on the first coat of hardened finishing material and allowing the same to set, then introducing a plastic material into the mold and permitting the same to dry and set, and finally removing the mold from the casting.

7. The process of casting plastic materials with a finishing coat, which comprises the lining of the mold with paraffine, the spraying of a film of alcohol and gypsum on the paraffine and permitting the alcohol to evaporate, then the spraying of a mixture of plaster of Paris and liquid on the first mentioned film and allowing the same to set, then the introduction of a plastic material into the mold and allowing the same to set, and finally removing the mold from the casting.

8. The process of casting plastic materials with a finishing coat, which comprises the lining of the mold with paraffine, the spray-

ing of a mixture of alcohol and gypsum on to the paraffine permitting the alcohol to dry and the gypsum to remain as a powder on the paraffine, the spraying of a liquid mixture of fine cementitious material on to the dry gypsum and permitting the same to set, the introduction of a concrete or cementitious material in a plastic condition under great pressure into the mold and permitting the same to set, and then removing the mold from the casting.

In testimony whereof I affix my signature.

LLOYD G. COPEMAN.