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J. H. HALL

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PATTERN FOR SAND-CEMENT FOUNDRY MOLDS

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*Fig. 1.*

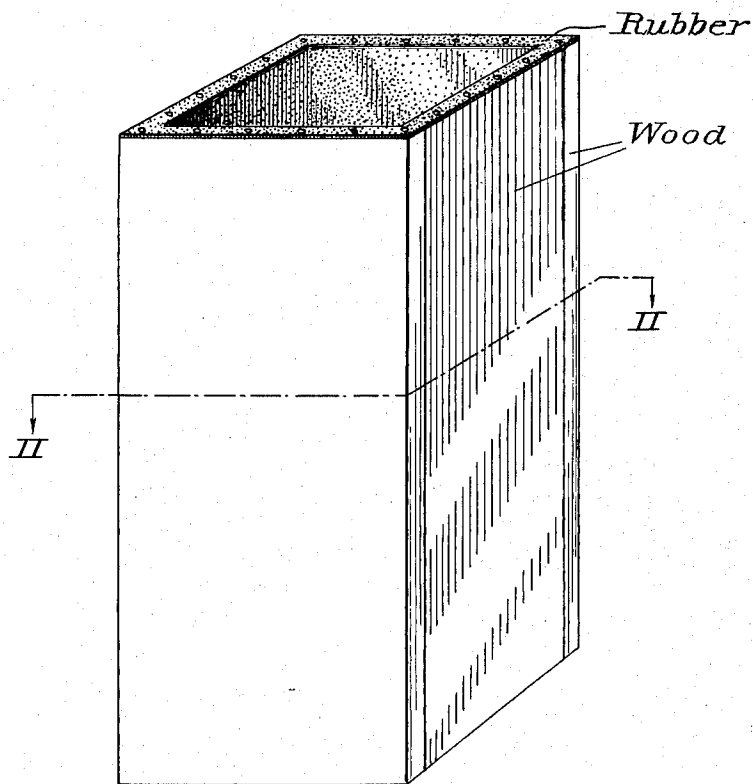
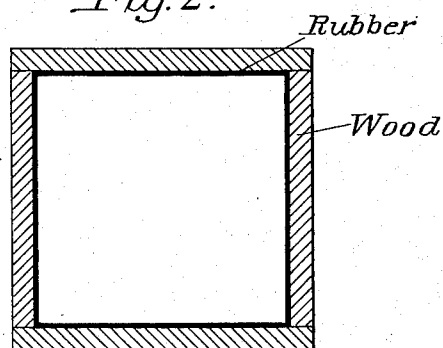


*Fig. 2.*



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## UNITED STATES PATENT OFFICE

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PATTERN FOR SAND-CEMENT FOUNDRY  
MOLDS

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1 Claim. (Cl. 22—193)

The present invention relates to patterns for sand-cement foundry molds and more particularly to a means for protecting the wood from which patterns are usually made against attack from the sand-cement mold mixture.

Fig. 1 is a diagrammatic view of a core box embodying my invention; and

Fig. 2 is a horizontal section along the line II—II of Fig. 1.

Foundry molds are universally made of sand and a suitable binder. The most commonly used molds are so-called green sand and dry sand molds in which binders, such as clay, loam, glutinous substances and oils are used. More recently a new process has come into use, known commercially as the Randupson process, and disclosed in the Durand United States Patents Nos. 1,918,089, 1,918,090 and 1,924,028. According to the Durand process the foundry mold is formed of a subhydrated mixture of sand and Portland cement. The amount of water supplied is less than that required to fully satisfy the cement, so that the mixture is relatively dry. However, when the mold is first formed and tamped into the pattern box there is some free moisture. Where the wooden patterns are used occasionally and have an opportunity to become dried between use, no particular problem is encountered in the use of wooden patterns. However, in certain repeat operations in which the patterns are continuously and repeatedly used, and also in cases where the patterns remain in the sand-cement mix for several hours, a serious problem has arisen due to the attack of the sand-cement mixture upon the wooden surfaces of the materials. This difficulty has been encountered in the core boxes for making sand-cement cores for casting ingot molds. In using these boxes the sand-cement core-forming mix is tamped into the box and is allowed to stand for a matter of two or three hours or until the cement has taken an initial set sufficient to permit the removal of the core box. During this time the wood of the core box has an opportunity to absorb some free moisture from the sand-cement mix. After the box is taken from the core it is immediately used again without giving the wood an opportunity to dry out. The result is that the surface of the box is badly attacked. The attack is aggravated by the alkaline properties imparted to the moisture by the cement, and also because of the abrasive effect of the sand upon the moist and chemically attacked surface of the wood. Attempts to protect

the wood surfaces against the action of moisture by the usual expedients, such as lacquers or varnishes, have proved unsatisfactory because such coats are rapidly abraded away by the sand.

I have found that the wooden surfaces of patterns, such for example as the core boxes above mentioned, may be protected against the attack from the moist Randupson sand-cement molding mixture by applying to the wooden surface a thin coating of rubber. Rubber is moisture-proof, it is not attacked by the cement, and it has the properties of resisting the abrasion from the sand-cement mixture. While a rubber surface is soft and easily cut, it resists the abrasion of the sand-cement to a remarkable degree. This is probably because the minute cuts in the rubber from the sharp edges of the sand grains are self-healing. At any rate, it is found that the surface of soft rubber resists such abrasion far better than a hard surface.

In the drawing I have illustrated more or less diagrammatically a core box embodying my invention. The box is made in the usual way from wooden boards. The inner face of the box with which the sand-cement mixture comes in contact is protected by a layer of rubber as indicated.

The rubber facing can be applied to the wood surface in various ways. I prefer to apply the rubber in the form of thin sheets of soft rubber which are cemented to the wooden surfaces by a suitable rubber cement. The sheets may be additionally secured, if desired, by tacks, particularly along the edges of the sheets. I have found that practically any good soft rubber sheeting will serve the purpose. A so-called combination rubber sheeting which has one side smooth and the other side sticky is particularly adapted for my purposes since the rubber cement adheres well to the sticky side of such sheeting. The sheeting is preferably about 0.03 to 0.04 inch thick. The soft rubber sheeting is flexible and stretchable and conforms fairly well to irregular wooden surfaces. A sheeting can be selected of a sufficient thickness to withstand the abrasion from the sand-cement mixture.

While I prefer to use rubber sheeting because of its excellent resistance to abrasion as well as to the chemical attack of the alkaline moisture from the sand-cement mixture, the rubber may be otherwise applied as in the form of rubber paints, particularly rubber latex base paints. Usually several layers of such paint are re-

quired in order to build up the requisite thickness of facing to resist the abrasion. The rubber paints may be used for irregular surfaces or for corners in which it is more difficult to apply rubber sheeting. The wood pattern face may be surfaced partly with rubber sheeting, as on plain surfaces or those particularly subject to abrasion, while irregular surfaces and those which are not subject to as much abrasion may be surfaced with a rubber paint.

While the present invention was developed to meet the problem encountered in the wooden core boxes used for making sand-cement cores for ingot molds, the invention may be utilized wherever it is found that the surfaces of wooden patterns are attacked by the sand-cement mixture. The word "pattern" is intended to cover generically the various parts such as the boxes

and other wooden parts used for shaping the sand-cement mix in making foundry molds.

While I have described the preferred embodiment of my invention, it is to be understood that the invention is not so limited but may be otherwise embodied and practiced within the scope of the following claim.

I claim:

The process of making foundry molds which comprises forming a moist mixture of sand and cement and tamping such mixture in a wooden pattern, and allowing the mixture to remain in contact with the wooden pattern until it has set at least initially, and protecting the wooden surfaces of the pattern against attack from the moist sand-cement molding mixture by the application thereto of a protecting facing of rubber.

JOHN HOWE HALL.