

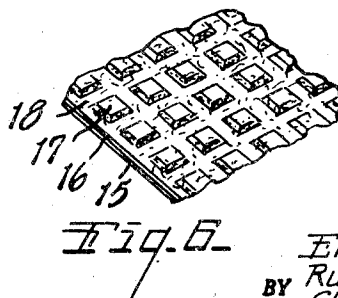
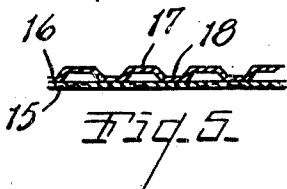
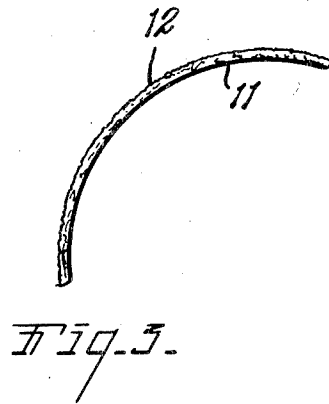
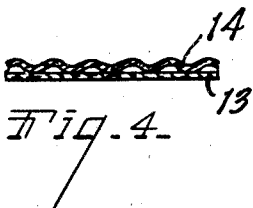
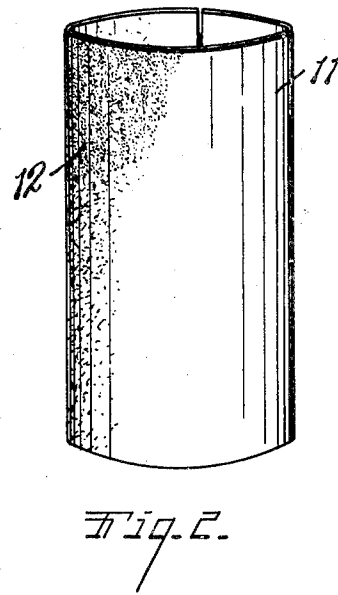
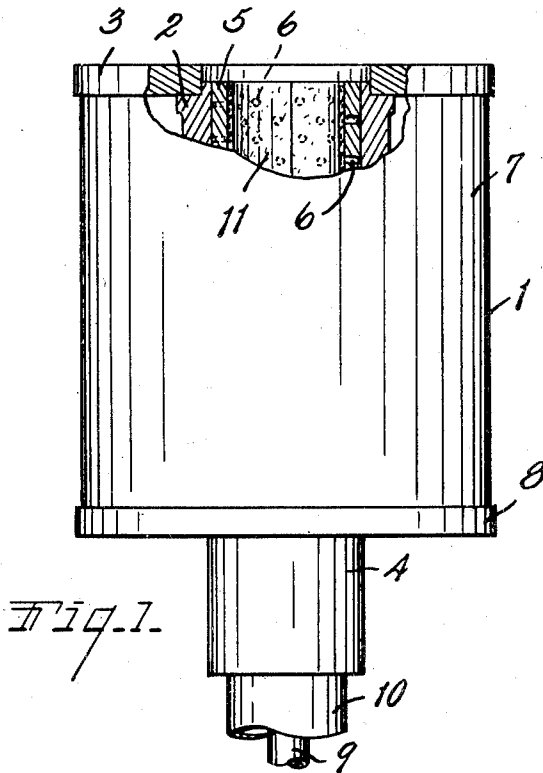
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2,489,322

LINER FOR CENTRIFUGAL CASTING MOLDS

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LINER FOR CENTRIFUGAL CASTING
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4 Claims. (Cl. 22-113.5)

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This invention relates to improvements in liner for centrifugal casting molds.

The principal objects of this invention are:

First, to provide a liner for a permanent mold casting device which will present a smooth, even surface to the molten metal and at the same time permit the escape along the walls of the liner of gases formed in the casting operation.

Second, to provide a preformed heat resistant liner for a permanent mold which will form pockets between the liner and the mold for the escape of gases, but which will be adequately supported to form an even casting surface.

Third to provide a heat resistant liner for a permanent mold which is easily and inexpensively formed from sheet material.

Fourth, to provide an improved mold or mold apparatus which facilitates the making of castings.

Other objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

The drawings, of which there is one sheet, illustrate a casting device employing our liner and two modified forms of liners.

Fig. 1 is a plan view partially broken away and in cross-section illustrating a centrifugal molding device embodying our invention.

Fig. 2 is a perspective view of the mold liner of Figs. 1 and 2 in tubular shape ready to be installed in the mold.

Fig. 3 is a fragmentary end view showing a sector of the liner shown in Fig. 2.

Fig. 4 is a fragmentary cross-sectional view through a modified form of liner.

Fig. 5 is a fragmentary cross-sectional view through a second modified form of liner.

Fig. 6 is a fragmentary perspective view of the liner illustrated in Fig. 5.

The reference character 1 indicates generally a centrifugal casting machine which is provided with a permanent tubular mold 2 which is mounted on the annular end plate 3 for rotation about the axis of a sleeve 4. A liner sleeve 5 is positioned within the mold 2 and is provided with a series of radially extending holes 6 for conducting gases formed in the casting operation away from the center of the mold. A cylindrical jacket 7 and annular flange 8 connect the end plate 3 and sleeve 4 with the jacket in spaced radial relationship with the mold 2 so that air may be circulated around the mold by being pumped in through the central pipe 9 and exhausted through

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the hollow shaft 10 for cooling the mold. The construction and operation of the mold is more particularly described and claimed in our co-pending application, Serial No. 691,348, filed August 17, 1946.

Positioned within the sleeve 5 is the preformed bendable sheet mold liner 11 which is formed of sheet asbestos material and bent or rolled into tubular shape when it is installed in the mold to fit snugly within the sleeve 5. As is shown in Figs. 2 and 3, the outer surface of the liner 11 is relatively rough or unfinished, leaving a series of small irregular interconnected passages or channels 12. The surface may be formed by surface cooking, rolling, pillaring, or stipling. The inner surface of the liner 11 is as smooth as is practical and presents a regular and accurate surface against which the molten metal will be cast.

Gases formed in the mold due to burning of the starch or binder, moisture in the liner or otherwise generated or produced during the casting operation, emerge into the small passages or depressions 12 and follow through this space to the nearest radial hole 6 in the sleeve 5 from where they may escape without causing the liner to bulge inwardly, out of shape, and spoil the shape of the casting.

The individual sheets are as long as the permanent mold they are to be used in and slightly less in width than the circumference of the mold, so that a narrow split is left in the liner as shown in Fig. 2 when installed in the mold.

The modified form of liner illustrated in Fig. 4 consists of an inner ply 13 which is joined with an outer corrugated ply 14 in a laminated construction. The grooves of the corrugated sheet run longitudinally so as not to interfere with the rolling of the liner into tubular form. Liners made from sheets of this multi-ply material permit the escape of casting gases along the flues or passages formed by the corrugations of the outer ply 14 and the wall of the mold, while at the same time adequately supporting the smooth inner ply 13 to form the casting surface.

The modified form of liner shown in Figs. 5 and 6 is also of laminated construction and consists of an inner ply 15 and an outer ply 16 which has been rolled or pressed into the regular series of rectangular depressions 17 separated by the ribs 18. The lower surfaces of the depression 16 support the inner ply 15 while casting gases may escape along the ribs 18.

All three modifications of the liner are manu-

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factured in preformed bendable sheet form and are rolled to permit insertion in the mold cavity and readily expand into supported relation to the wall thereof. While asbestos has been described as a highly desirable material for the sheets, any heat resistant material which will not be consumed by the molten metal may be used.

As is explained more fully in the above mentioned copending application, the asbestos liner aids in controlling the grain structure of the casting by retarding the cooling rate at its surface and makes it easier to withdraw the casting from the mold as the liner is removed from the mold with the casting as a unit. The liner also protects and prolongs the life of the permanent mold.

We have illustrated and described our invention in highly practical embodiments thereof and with certain modifications or adaptations. We have not illustrated or described other modifications or adaptations which we contemplate as it is believed that this disclosure will enable those skilled in the art to embody or adapt our invention as may be desired.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A mold comprising a tubular mold member of metal, and a bendable resilient liner of preformed sheet asbestos for the mold cavity wall thereof loosely arranged in rolled position therein and radially supported against unrolling by the wall thereof with the edges of the sheet in closely adjacent non-attached relation, the liner being unconnected with the mold wall and being removable therefrom with the casting formed therein, the liner having a substantially smooth inner surface and a corrugated outer surface in supported engagement with the mold wall and coating therewith to provide vent openings between the liner and the mold wall.

2. A tubular metal mold member having an approximately cylindrical mold cavity wall of uniform cross section from end to end, and a bendable resilient liner of preformed sheet asbestos disposed in rolled position within the mold cavity in radially supported relation to the wall thereof and constituting a substantially complete facing therefor, the liner being free to expand radially by unrolling into close supported contact with the mold wall but being otherwise entirely unconnected to the mold wall, the liner sheet having a substantially smooth inner surface and a

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roughened outer surface coating with the mold wall to provide venting spaces between the liner and the wall.

3. A mold comprising a rotatably mounted tubular mold member, and a bendable resilient liner of preformed sheet heat resistant material for the mold cavity wall thereof loosely arranged in rolled position therein and radially supported against unrolling by the wall thereof with the edges of the sheet in closely adjacent non-attached relation, the liner being unconnected with the mold wall and being removable therefrom with the casting formed therein, the liner having a multiplicity of spaced raised elements on its outer surface in supported engagement with the mold wall and coating therewith to provide vent openings between the liner and the mold wall.

4. A tubular metal mold member having an approximately cylindrical mold cavity wall of uniform cross section from end to end, and a bendable resilient liner of preformed sheet asbestos disposed in rolled position within the mold cavity in radially supported relation to the wall thereof and constituting a substantially complete facing therefor, the liner being free to expand radially by unrolling into close supported contact with the mold wall but being otherwise entirely unconnected to the mold wall, the liner sheet having closely spaced supporting protuberances on the outersurface coating with the mold wall to provide venting spaces between the liner and the wall.

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