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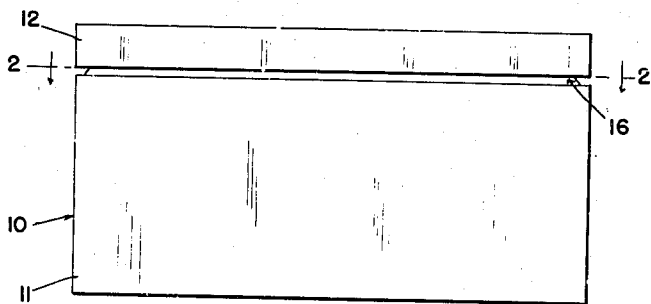


FIG.1.

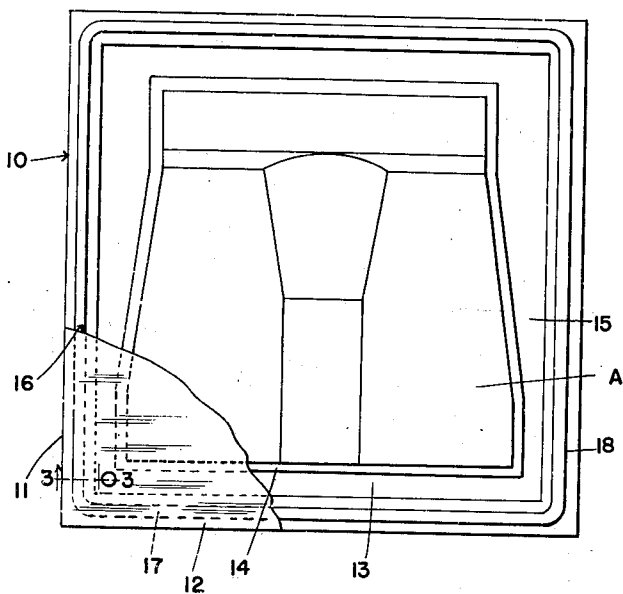


FIG.2.

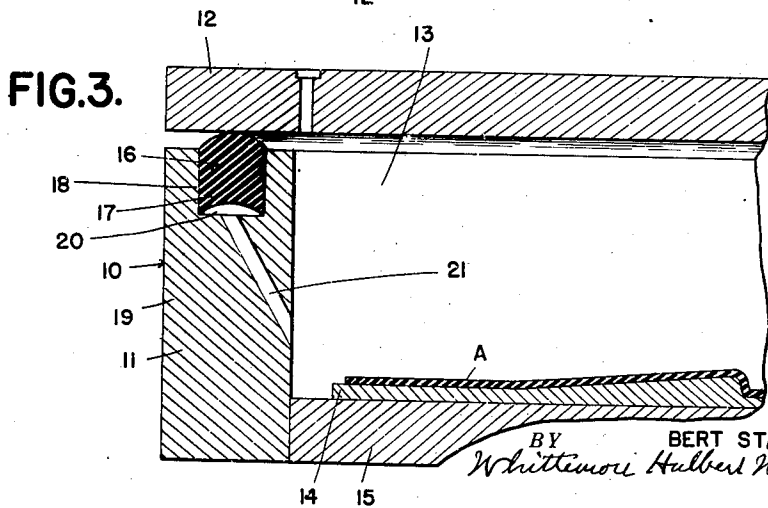


FIG.3.

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SEAL

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4 Claims. (Cl. 220—46)

This invention relates generally to seals and refers more particularly to an improved seal for molding apparatus of the type employing fluid under pressure to urge the stock into intimate contacting relation with a contoured form.

Although it will be understood as this description proceeds that my improved seal is capable of numerous and diversified uses, nevertheless, it finds particular utility when employed to provide a seal between relatively movable sections of a fluid pressure chamber or mold. In accordance with the illustrative embodiment of the invention a strip of flexible material such as rubber is fixed to one of the relatively movable parts of the mold for engagement with the other cooperating part in the relative position the same assume when forming the fluid pressure chamber, and it is one of the principal objects of the present invention to provide a seal of the character wherein the pressure of the fluid confined in the chamber acts upon the seal to intimately engage the same with both of the aforesaid parts of the mold. This arrangement is of particular utility in cases where the parts of the mold are mounted for relative sliding movement adjacent the sealing strip, since it renders it possible to so adjust the parts that during relative sliding movement of the same very little or no pressure is exerted on one of the parts by the seal mounted on the other of the parts. In other words, the seal functions only in the relative position of the parts required to form the fluid pressure chamber, and, accordingly, during relative movement of the parts to any of the other positions thereof the seal may be relieved from frictional engagement. This appreciably reduces the wear of the seal and also provides for minimizing the power required to effect the desired relative movement of the parts of the mold.

The foregoing, as well as other objects, will be made more apparent as this description proceeds especially when considered in connection with the accompanying drawing, wherein:

Figure 1 is a side elevational view of a mold equipped with a seal constructed in accordance with this invention;

Figure 2 is a sectional view taken substantially on the plane indicated by the line 2—2 of Figure 1;

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2.

Although the seal forming the subject matter of this invention may be advantageously employed in all cases where it is desired to confine fluid under pressure in a chamber, nevertheless,

for the purpose of illustration, I have shown my improved seal in connection with apparatus for forming yieldable stock to a predetermined contour by placing the stock on a suitable contoured form and subjecting the same to the action of fluid pressure preferably heated to the temperature required to vulcanize or cure the stock to the contour of the form.

Referring now more in detail to the drawing, it will be noted that I have illustrated in the several views a molding device 10, comprising a platen 11, and a header 12. In the present instance the platen 11 is mounted for sliding movement relative to the header 12 and cooperates with the latter in one position to form a fluid pressure chamber 13 communicating with a source of fluid supply (not shown) through a suitable passage in the header.

In the illustrative embodiment of the invention a contoured form 14 is secured upon the inner surface of the bottom wall 15 of the platen in any suitable manner, and this form is adapted to support a sheet of uncured stock designated herein by the reference character A. The stock A is positioned upon the form 14 when the platen 11 is moved relative to the header 12 to a position wherein the interior of the platen is sufficiently exposed to permit the stock to be inserted therein through the top of the same. After the stock has been properly positioned upon the contoured form the platen is moved to its closed position with respect to the header 12, wherein the same cooperates with the latter to form the chamber 13, and fluid under sufficient pressure is introduced into the chamber 13 through the header to force the stock into intimate engagement with the contoured surface of the form 14. As stated above, this fluid is preferably of sufficient temperature to actually cure or vulcanize the stock to the contour of the form.

It will be apparent from the foregoing that the success of the forming operation briefly outlined above depends to a great extent upon the ability of the chamber 13 to confine the fluid pressure during the molding operation, and this is effectively accomplished in the present instance by my improved type of seal designated in the several views of the drawing by the reference character 16. As shown particularly in Figure 3 of the drawing, the seal 16 is in the form of a continuous strip of material 17 secured to the platen 11 adjacent the header 12 for engagement with the under side of the header. The strip 17 is preferably formed of rubber, or of a material containing rubber, and is se-

cured within a continuous recess 18 formed in the upper edges of the side walls 19 of the platen.

Upon reference to Figure 3, it will be noted that the strip 17 projects beyond, or above the upper edges of the side walls 19 and that this portion of the strip is convex or arcuate in cross sectional contour for engagement with the header 12. The bottom surface of the strip is concaved to cooperate with the adjacent wall of the recess 18 to form a chamber 20 coextensive with the strip 17 and communicating at points spaced throughout the length thereof with the interior of the chamber 13 by means of passages 21. The arrangement is such that fluid under pressure introduced into the chamber 13 through the header 12 not only acts upon the stock A to mold the same to the contour of the form 14, but also flows through the passages 21 into the chamber 20 beneath the strip 17 and acts upon the concaved bottom surface of the strip 17 to flex the strip in an upward direction the extent required to intimately engage a portion of the arcuate top surface of the strip with the header 12. It may be pointed out in this connection that the area of the concaved bottom surface of the strip 17, exposed to the chamber 13, is substantially greater than the area of the sealing surface in order to effect the pressure differential required to provide an efficient seal.

When the fluid under pressure in the chamber 13 is exhausted after the molding operation the pressure on the concave bottom surface of the sealing strip 17 is relieved, permitting the strip to return to its original position, and the construction is preferably such that when the strip returns to its normal position the top or sealing surface of the strip is substantially free from frictional contact with the header. As previously stated, this is desirable not only because it appreciably increases the life of the seal, notwithstanding the periodic sliding movement of the platen, but also because it reduces the power required to actually effect sliding movement of the platen.

While in describing the present invention particular stress has been placed upon the association of my improved seal with a sliding platen, nevertheless, it is to be understood that the seal is by no means limited to this specific application, and reservation is made to make such changes in the construction as may come within the purview of the accompanying claims.

What I claim as my invention is:

1. A seal for fluid chambers having relatively movable sections cooperating in one relative position thereof to form a fluid pressure chamber, said seal carried by one of the sections and comprising a deformable strip having a sealing surface convex in cross section for engagement with the cooperating section in the aforesaid relative

position of the sections and having an opposed surface exposed to the action of the fluid under pressure in the chamber to force said convex surface into engagement with said cooperating section, the area of the surface exposed to the fluid pressure being larger than the area of contact between the convex sealing surface and the cooperating section to create a unit pressure between said convex surface and said cooperating section which is greater than the unit pressure of the fluid in the chamber.

2. A seal for fluid chambers having relatively movable sections cooperating in one relative position thereof to form a fluid pressure chamber, said seal carried by one of the sections and comprising a deformable strip having a sealing surface convex in cross section for engagement with the cooperating section in the aforesaid relative position of the sections and having an opposed concave surface exposed to the action of the fluid under pressure in the chamber to force said convex surface into engagement with said cooperating section, the area of said concave surface being greater than the area of contact between the convex sealing surface and the cooperating section to create a unit pressure between said convex surface and said cooperating section which is greater than the unit pressure of the fluid in the chamber.

3. A seal for fluid chambers having relatively movable sections cooperating in one relative position thereof to form a fluid pressure chamber, one of said sections having a groove therein adapted to receive the seal, said seal having a sealing surface engageable with another of the sections in the aforesaid relative position of the sections and having an opposed surface exposed to the action of fluid under pressure in the chamber, the area of that portion of the sealing surface of the seal which engages the second-mentioned section being smaller than either the area of the groove at the surface of the first-mentioned section or the area of the seal exposed to the action of fluid pressure in the chamber to provide a unit pressure at the sealing surface greater than the unit pressure of the fluid in the chamber.

4. A seal for fluid chambers having a pair of relatively movable sections one of which is provided with a groove having parallel side walls, said seal being positioned in said groove and having a sealing surface engageable with the other of said sections and having an exposed surface exposed to the action of fluid under pressure in the chamber, the area of the surface exposed to fluid pressure being greater than the area of contact between the sealing surface and the second-mentioned section to create a unit pressure at said area of contact greater than the unit pressure of the fluid in the chamber.

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