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PRESS HEAD FOR SAND MOLDS

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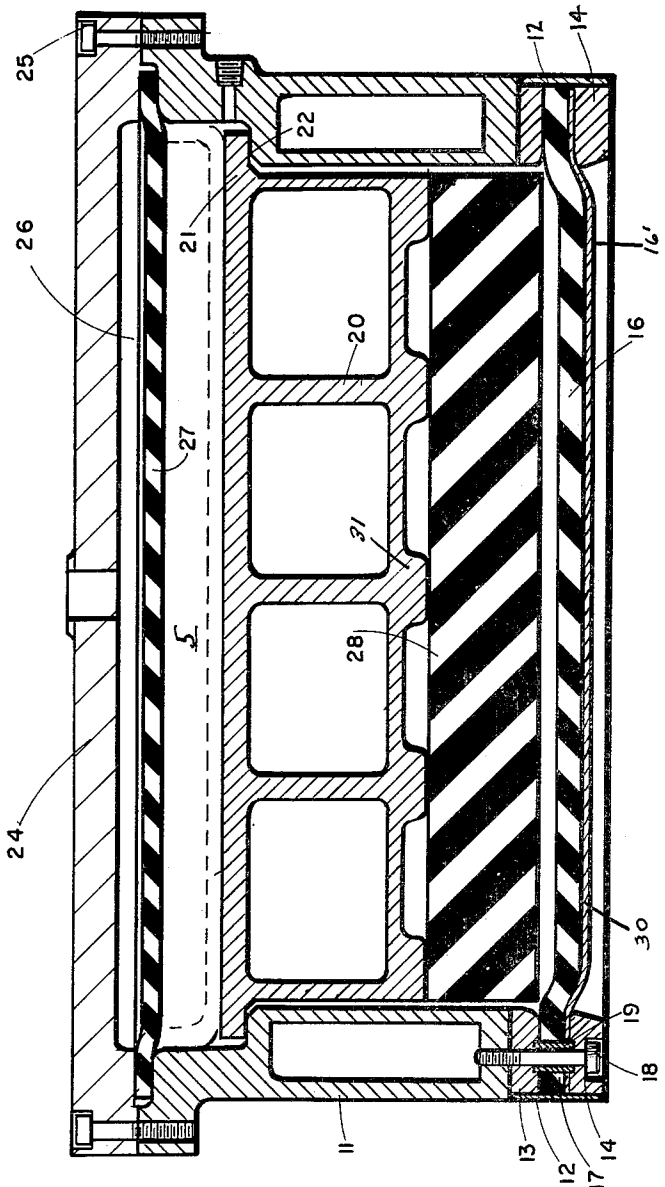

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PRESS HEAD FOR SAND MOLDS

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This application is a continuation in part of patent application, Serial No. 124,082, filed July 14, 1961, which issued as Patent No. 3,041,683 on July 3, 1962.

This invention relates to molding machines and, more particularly, to the type of molding machines known as diaphragm molding machines.

Prior machines were unable to pack sand uniformly around the pattern and throughout the mold because they did not concentrate a force adjacent the edge of the pattern.

In the several embodiments of the invention herein, a molding machine is shown wherein a diaphragm type molding machine is shown in one embodiment and, in the other embodiments, a molding machine utilizing a plurality of closely spaced pistons is used.

It is, accordingly, an object of the present invention to provide an improved molding machine.

Another object of the invention is to provide an improved molding machine which will make molds of uniform hardness.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

The figure of drawing is a transverse cross sectional view of a molding machine head according to the invention.

Now with more particular reference to the drawings, the molding machine head shown in FIG. 1 is adapted to be mounted on a press ram of a molding machine and to be forced down into sand inside a flask such as the flask shown in the other embodiments of the invention or the flask could be forced up against the head.

Use of an internal floating piston frame in the machine shown at **20** which is reciprocably mounted in the head allows changing of the internal backup material to meet any special conditions. This frame is replaceable. The frame or piston can be removable to make the compensating backup to match special pattern configurations.

The flexible member **28** of the compensating backup may be consrtucted of a solid, flexible, or semi-flexible material or of flexible material containing one or more cavities to provide special resistance for special pattern configuration. The compensating backup may be profiled to match special pattern configuration.

The air space contained between the member **28** and the flexible diaphragm **16** may be varied to provide special yielding force to match special pattern configuration. It may be used as a fixed head with the mold being squeezed up to the head or may be mounted on a down-acting squeeze cylinder so it is squeezed down into the mold. Air pressure may be put into a space **26** in order for a compensating action in the lower area and, also, (if low pressure) to keep the diaphragm up.

The spacer pad **31** varies the lower space between the diaphragm **16** and an upper chamber **5**. It also regulates the total stroke of the compensating backup. The spacer pads **31** will vary only the upper chamber for air compression ratio.

Air pressure could be constant or it could vary. Pressure can be injected and locked in the space **26**. Air injection can be timed with a suitable control circuit synchronized with the machine operation.

The head has an outer frame **11** which may be rectangular and this frame is made of rigid material such as steel. It has a diaphragm frame **12** attached to its lower end. The diaphragm frame **12** is made up of an upper frame **13** and a lower frame **14** which are held in spaced relation and sandwich the outer peripheral edge of the diaphragm **16** therebetween. The diaphragm **16** may be made up of a heavy piece of rubber covered with a sheet **16'** of urathane or other abrasive resistant material.

The two diaphragm frame sections **13** and **14** are held in spaced relation by a plate **17** which is welded to both frame sections **13** and **14**. The diaphragm is held in place by bolts **18** which extend through holes in both frame sections and have cylindrical tube like spacers **19** which extend through holes in the diaphragm and rest against each of the two frame sections **13** and **14** to hold them in spaced relation. Bolts **18** threadably engage threaded holes in the frame **11**.

The piston frame **20** is slidably supported inside the frame **11** and has flanges **21** which rest on a flange **22** inside the frame **11**. The head is suitable to be attached to an upper head **24** which is bolted to the frame **11** by means of bolts **25**. The air space **26** is defined between an upper diaphragm **27** and the head **24**. Thus, when the head is forced down into engagement with sand in a mold, the diaphragm **16** will engage the sand and force it up against the rubber pad member **28**. Force of air in the space **26** compensating the member **28** will be exerted by the diaphragm **27** which will urge the compensating member down and resist the upward movement of the member **28**. Thus, the sand will be moved in a manner similar to that shown in the said parent patent application.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A molding machine head adapted to enter the open top of a flask, said head having a rigid frame defining the rim of an open cavity therein, a first diaphragm made of a sheet of flexible material having its edges attached to said frame, a piston reciprocably mounted in said head, said piston having a resilient block attached thereto, said block being coextensive with substantially all of the area of said first diaphragm, a second diaphragm on the opposite side of said block from said first diaphragm, said second diaphragm having its peripheral edges attached to said head, said second diaphragm being substantially coextensive with said piston, and fluid means to urge said second diaphragm downward to force said block into engagement with said first diaphragm.

2. A head adapted to exert a pressure on material,
said head having a rigid frame defining the rim of an open cavity therein,
a first diaphragm made of a sheet of flexible material having its edges attached to said frame,
a piston reciprocably mounted in said head,
said piston having means coextensive with substantially all of the area of said first diaphragm engaging said first diaphragm,
a second diaphragm on the opposite side of said head from said first diaphragm,
said second diaphragm having its peripheral edges attached to said head,

said second diaphragm being substantially coextensive with said piston,

and fluid means to urge said second diaphragm downward to force said head into engagement with said first diaphragm.

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