

Jan. 25, 1966

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3,230,561

FOUNDRY FLASK CLEANING MACHINE

Filed Dec. 13, 1963

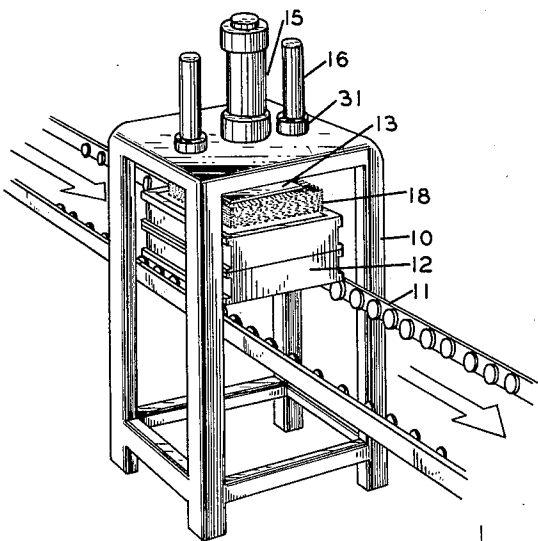


FIG. 1

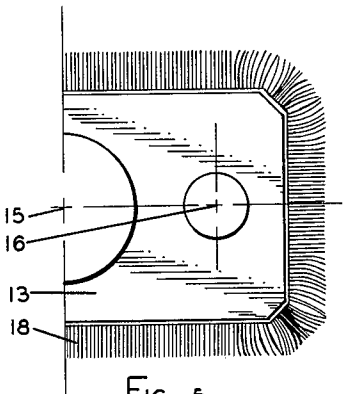


FIG. 5

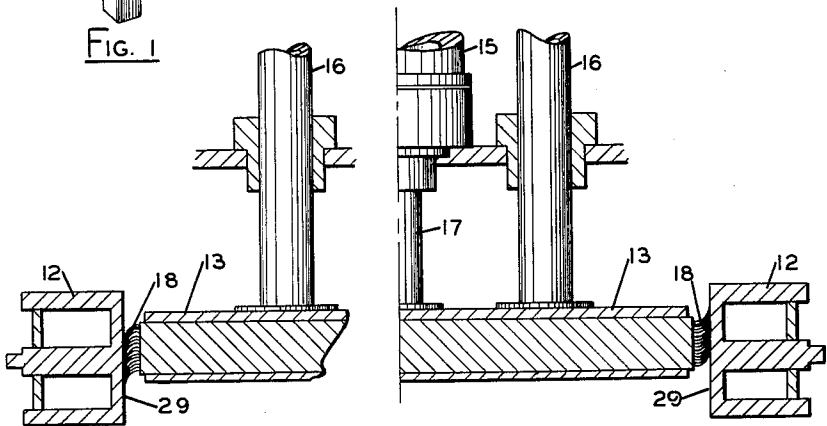


FIG. 3

FIG. 2

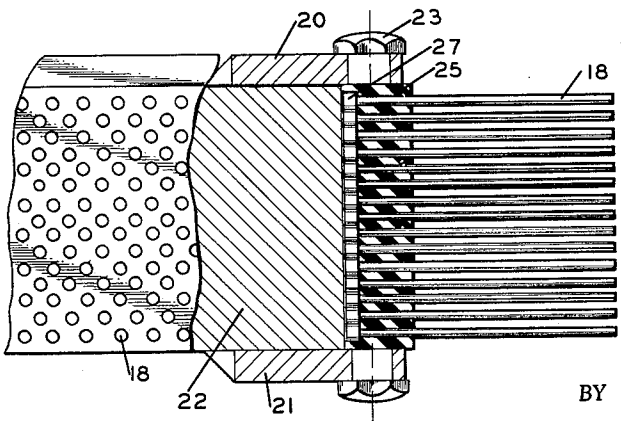


FIG. 4

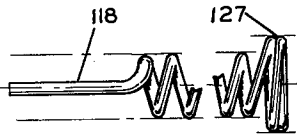


FIG. 6

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FOUNDRY FLASK CLEANING MACHINE

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Filed Dec. 13, 1963, Ser. No. 330,290

1 Claim. (Cl. 15—56)

This invention relates to cleaning devices and, more particularly, to cleaning devices for molding machines.

After a mold has been punched out of a flask, there is generally some sand which still adheres to the inner surface of the flask. It is vital that this sand be removed from the flask before the flask re-enters the molding machine. This is because when the flask is entering the molding machine, the lumps or cakes of sand may drop from the flask and fall on the pattern. If the pattern blowoff device does not remove those lumps of sand, it is detrimental to the next mold that is made, because of loose or dry sand in the mold face. Another problem is that if the flask itself seats down on top of a lump of sand, it would not seat properly and may cause the mold to break or to be damaged when the mold is stripped from the pattern.

The usual method of removing sand and castings from a flask is to use a shakeout. By the very nature of the action, the shakeout causes damage to the flasks. When using a punchout, it is not necessary to put the flask on a shakeout to remove the castings and hot sand from the flask. Therefore, in this instance all of the sand in the flask is not removed.

The method disclosed herein is to move a platen or steel plate having wipers or brushes thereon through the empty flasks after the mold has been punched out. It is used to scrape or brush the inside surface of the flask and flask bars to remove the final amount of sand.

Because of the high pressures and the very dense molds that are being made today, there is generally some sand in the flask that is quite hard and, in many instances, actually become cakes and adheres quite strongly to the flask walls. Rubber and leather wipers do not have enough rigidity or life expectancy to make them practical. Wire brushes as such have not been designed for this application and are not practical because of the high price involved.

One of the problems is the uneven wear factor in a mechanism of this kind. The ideal situation would be to have a multiplicity of brushes or other cleaning devices that are readily replaceable.

In an effort to meet this condition numerous independent spring type fingers or members, each of which would operate independently of the other, are employed. Spring type bars or members are independently seated into a block or member which in turn would be rigidly fastened to the platen or plate. This platen is moved in and out of the empty flask by an independent power source. The platen with the wires or bristles attached are suspended above the empty flask.

Actuated by a signal from a control circuit the independent power source, either an air or hydraulically operated cylinder, drives the platen with the attached cleaning device through the flasks. It continues all the way through the flask so as to obtain a complete wiping or brushing action. The return stroke gives a similar action in the opposite direction.

It is, accordingly, an object of the present invention to obtain the proper amount of flexing action in these units so as to minimize the wearing of the units and, at the same time, maintain enough pressure on the side of the flask to obtain the maximum or desired wiping or cleaning action.

Another object of the invention is to provide an improved molding machine cleaning station.

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A further object of the invention is to provide a molding machine cleaning station which is simple in construction, economical to manufacture, and simple and efficient to use.

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 drawing and more particularly pointed out in the appended claim, 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.

In the drawing:

FIG. 1 shows a cleaning station and flasks to show its general application in a molding line;

FIG. 2 shows a side view of the brush in its starting position, with its motion in one direction;

FIG. 3 shows the brush with a motion in its returned direction;

FIG. 4 shows an enlarged view of the platen itself showing a method of adjustment for the independent brushes or wire.

FIG. 5 shows a plan view of a platen with the attached brushes showing the relative position of each; and

FIG. 6 shows a view of another type of wire or bristle.

Now with more particular reference to the drawing, the cleaning station 10 is shown supported along the conveyor track 11. The flasks 12 are conveyed along the track in the direction of the arrows. The platen 13 is supported on the hydraulic or air cylinders 15 and guide members 16. Thus, by actuating the cylinder 15, the platen member 13 may be moved up and down in the flask 12.

The platen specifically shown in FIGS. 2, 3, and 4 has its center attached to a piston rod 17 of the cylinder 15 and has the rods which are, in effect, brush bristles indicated at 18 extending laterally therefrom. These bristles may be made of wire, spring steel, or other resilient material and be approximately one-eighth inch in diameter, for example. These rods are smaller than the holes which receive them and, therefore, they move in these holes as they move through a flask. The stress concentration is also relieved at the root of each bristle. FIG. 2 shows the platen being moved to a downward position and FIG. 3 shows it being moved to an upward position.

The platen itself is made up of an upper plate 20 and a lower plate 21 that are held in spaced relation by the filler material 22 disposed therebetween. This filler material could be some material such as cast iron and the plates 20 and 21 could be made of steel.

The outer edges of the platen has bolts 23 extending therethrough and these bolts clamp the rods 18 between the spacer members 25. These spacer members may be made of resilient hard rubber or the like or of rigid material such as steel. When hard rubber is used, the rubber will deflect at the outer edge when the rods bend and, thus, the rods will not have a stress concentration which would break them.

The rods 18 have heads 27 thereon and these heads hold the rods in position.

From an inspection of the figures of drawing, it will be seen that when the platen 13 is pulled upward, the rods 18 will brush the inside surface 29 of the flask and when they are moved downward as in FIG. 2, they will also brush the inside surface 29. The guide rods 16 insure that the platen will move straight up and down.

The member that does the cleaning or brushing must have some flexibility to contour or to shape itself to meet the varying surfaces of the inside of flasks that it is trying to clean. It must at the same time be rigid enough to actually scrape or work the sand loose.

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In FIG. 6, a bristle 118 has a straight portion connected to a helical portion 127. The helical portion 127 is fixed to the member 22 of the other embodiment of the invention.

This device results in practically no wear and tear on the flask, pins, or bushings, due to vibration or shock. The brushing platen can be attached to the punchout platen as shown in patent application Serial No. 322,104, filed November 7, 1963.

The unit can have quick change replaceable platens with wire brushes attached of different sizes to adapt the line to various size flasks.

Its direction of travel is versatile because it is self-supporting and does not rely upon its position or direction to control its successful operation.

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 as broadly novel as is commensurate with the appended claim.

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

In combination, a support for flasks and a platen, means on the outer edges of said platen to engage the insides of said flasks and remove sand therefrom as said platen moves through said flasks, means to move said platen through said flasks, said platen being smaller than the insides of said flasks,

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said means on the outer edges of said platen to remove sand from the insides of said flasks comprising bristles,

said bristles comprising outwardly extending rods having heads on their inner ends,

said platen comprising spaced plates,

filler material holding said plates in spaced relation, said rods being disposed between the outer edges of said plates,

resilient material such as hard rubber between said rods,

and means to force said plates together whereby the head of each said rod is clamped between said plates.

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