BLOW PLATE FOR CORE BLOWING MACHINES

FIG. 2.

FIG. 5.

FIG. 6.

FIG. 8.
BLOW PLATE FOR CORE BLOWING MACHINES

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Application May 20, 1950, Serial No. 163,269

1. Claim. (Cl. 22—10)

This invention pertains to core blowing machines such as are used in foundries to inject the core material into a core box by means of compressed air.

The invention is directed more particularly to a blow plate through which the sand or other core material is injected into the core box.

In general terms this invention comprises a blow plate arranged for attachment to the bottom of a sand container. This plate is constructed of a pair of plates secured together with a space therebetween providing an air duct communicate with the surrounding atmosphere outside of the core box or sand container, and provides a passage through which a core box may be vented. This pair of plates is pierced by a series of perforations, each aligned or matched in the two plates and the series as a whole being arranged in a pattern such as a lattice. In addition to this compound plate, a series of plugs and bushings is provided. The bushings are all made generally cylindrical to fit into a pair of perforations and are long enough so as to seal off the air passage at the point where the bushings pass through. The plugs are of similar shape and similarly fitted into the perforations, but are closed at the upper end thereof so as to close the perforations against the passage of sand therethrough. The plug, therefore, forms a hollow cylinder closed at its top end but the wall thereof is provided with an opening in line with the space between the plates. The lower end of the plug is open except for a screen extending across the opening. Thus, each plug while closing the perforations to the passage of sand establishes an air passage from below the plate to the air passage between the plates. Therefore, by arranging the bushings and plugs in the holes of the blow plate in a suitable pattern according to the shape of the core box cavity, a blow plate is provided having passages therethrough formed by the bushings for delivering sand to the core box at the proper points while other portions of the blow plate are shut off against the passage of sand. At the same time those perforations which are closed by plugs provide air vents from the interior of the core box to the air duct in the blow plate.

As another feature of this invention a pattern plate is provided by which the proper pattern for arranging the bushings and plugs may be determined. This pattern plate is transparent and has marked or formed thereon a series of pattern elements arranged to match the pattern of the perforations in the blow plate and having the same size as the plate and the same spacing and arrangement for the pattern elements. A fixture is then provided whereby this pattern plate may be placed over the core box and positioned with reference thereto in the same relation as that of the blow plate when the core box is mounted in the blowing machine. With the pattern plate so located above the core box, an experienced operator can by viewing the assembly determine the best arrangement for locating the bushings and plugs to obtain the quickest and most efficient injection of the sand into the core box. To make the process more convenient and reliable, the perforations in the blow plate and the corresponding pattern elements of the pattern plate may be marked with numbers or other symbols to identify their locations. Then, with the pattern plate in proper relation to the core box as described, the operator may upon selecting the desired location of the bushing and plugs make a record of the numbers representing those locations. Such record may be marked on the core box so as to be available whenever the same is to be used.

A preferred embodiment of this invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a central vertical section of a part of a core blowing machine showing a blow plate embodying this invention, also in section, in position to operate in the usual manner to fill a core box;

Fig. 2 is a plan view of a blow plate embodying this invention;

Fig. 3 is a vertical central section of one of the bushings;

Fig. 4 is a similar section of one of the plugs;

Fig. 5 is an enlarged detail section on line 5—5 of Fig. 2;

Fig. 6 is a similar section on line 6—6 of Fig. 2;

Fig. 7 is a plan view somewhat reduced in scale of a pattern plate embodying this invention and the fixture with which it is used; and

Fig. 8 is a section on line 8—8 of Fig. 7.

Referring now to the drawings, Fig. 1 represents a section of a blowing machine having a supporting column 1 mounted on a suitable floor support, not shown, and having a head 2 providing a piston. The column 1 is provided with an air passage 3 which may be connected in any suitable manner with a source of fluid pressure, not shown. A table 4 has a bore adapted to receive the piston 2 for movement therein so that said table may be lifted by fluid pressure supplied by the duct 3. Mounted in any suitable
manner above the table 4 is a sand container 5 adapted to hold a bed of sand or other core material 6. Secured to the bottom of the container 5 is a blow plate comprising an upper plate 7 and a lower plate 8 held in spaced relation by spacer strips 9 so as to provide an air passage 10 therebetween. As may be seen from Fig. 2, the strips 9 run along only two sides of the plates, the passage 10 being open to the atmosphere at the other two sides. The plates may be additionally supported at their center portion by studs 11 which may be welded in place as indicated at 12 in Fig. 5. Mounting studs 13 may be similarly secured to the plates at their corners to provide for mounting the same on the container 5.

The pair of plates so formed is pierced by a series of perforations 14 passing through both plates. These perforations may be arranged in any suitable pattern such as the latticed pattern shown in Fig. 2. Such pattern preferably covers a major portion of the area of the plates so as to render it suitable for use with any core box.

The bushing may be formed as shown in Fig. 3 comprising a simple hollow cylinder 15 provided at its top with a flange 16. The bore of this bushing extends entirely through it so that it provides a passage or duct for conveying sand through the blow plate.

Fig. 4 shows a plug 17 having a bore 18 which does not extend clear through but stops short of the top thereof to provide a closure 19. The plug may also be provided with a flange 16. At a point in the length of the plug such as to register with the passage 10, the wall of the plug is cut through to provide one or more openings 20. The lower end of the bore 18 may be closed by a screen 21.

As may be seen from Fig. 1, either a bushing or a plug may be inserted in any of the perforations 14, said perforations being counterbored to receive the flanges 16. When so placed in the perforations of the plates 7 and 8, each bushing provides a duct through which sand may pass from the container 5 into the cavity of the core box 22 positioned on the table 4. However, those perforations on which a plug 17 is inserted are closed against the passage of sand but open to the cavity of the core box so as to provide vents through which air may escape by way of the bore 18 and opening 20 into the passage 10 from which it may pass to the outer atmosphere.

In order to readily determine in what sort of pattern the bushings and plugs should be arranged, the fixture shown in Figs. 7 and 8 is provided. This fixture is simply a base or platform 23 upon one side of which is erected an upright wall or post 24. This wall 24 is provided with a projecting strip 25 and a core box 22 is provided with a groove matching this strip so that said core box may be placed upon the platform 23 as indicated in Fig. 8 with the strip 25 inserted in said groove. A pattern plate 26 is then placed upon the core box. This plate is also provided with a notch in one edge which may be fitted to the strip 25 as shown in Fig. 7.

When so assembled, the pattern plate and core box are in the same relative positions as the blow plate and core box when mounted properly in the blow-molding machine. The pattern plate 26 is provided with a series of pattern elements which may also be perforations as in the blow plate, but which may take any other desired form. They are, however, arranged in the identical pattern of the perforations in the blow plate and with the same spacing so that the pattern may be placed on the blow plate and each of said elements will be centered over one of the perforations in said blow plate. The pattern plate is of transparent material or of material at least sufficiently transparent so that when placed in the position of Figs. 7 and 8 the core box can be seen through the plate clearly enough to recognize the configurations of the core cavity therein. With the pattern plate so placed, an experienced operator can then determine by viewing the assembly at what points the sand can be injected more advantageously and he can, therefore, regulate the positions of the bushings and plugs so that when they have been so placed in the blow plate and the core box assembled in the machine as in Fig. 1, all of the perforations will be closed by plugs, except those best located for delivering the sand to the core box. This may be done, for instance, in the embodiment illustrated by providing a series of buttons, corks or similar elements (not shown) fitting the perforations in the pattern plate 26. As the operator selects the proper location for each bushing 18 he places a button in the corresponding perforation of the pattern plate. When all such locations have been selected the buttons show the pattern that the bushings are to form in the blow plate. All the remaining holes receive vent plugs 17.

The perforations in the blow plate may be numbered or provided with any suitable series of symbols, such numbering being indicated in Fig. 2, and the pattern plate 26 may be similarly numbered or symbolled so that the symbol of each element on the plate 26 is the same as that on the identically located perforation in the blow plate. With such a system of marking, the operator can then make a record of the numbers of the positions selected for either the bushings or the plugs, or both. Such a record may be preserved by marking it on the core box or in any other suitable way so that at any subsequent time the proper pattern for arranging bushings and plugs can be determined by reference to said record.

It will be seen, therefore, that this invention provides a blow plate of comparatively simple construction which is capable of rearrangement in the location of its blowing orifices to suit practically any core box. An arrangement can be made such as to locate the sand inlets in the most advantageous way to fill the core in the shortest time and with the least expenditure of power.

It will be noted, also, that the plugs 17 provide vent openings at the top of the core box, therefore, providing means for venting the core box at its top. By this arrangement the air moving toward the vents moves directly upward so that side currents of air tending to displace the sand or to disturb it after it has been deposited are eliminated. Accordingly, a core of uniform texture can be obtained.

Thus, the invention provides a blow plate which is of universal application since the arrangement therein of inlets and vents may be altered at will to suit any core box and it achieves a great saving in time, trouble and expense over the present practice in which a separate blow plate is provided for each core box.

Various changes may be made in the details of construction, within the scope of the appended claim, without departing from the spirit of this invention. Parts of the invention may be used without the whole and improvements may be
added while retaining some or all of the advantages of the invention.

I claim:

In a core blowing machine of the character described having a table for supporting a core box and a sand container mounted above said table, the combination with a bottom for said container comprising a pair of plates secured together in spaced relation to provide an open air passage therebetween, said plates being pierced by matched perforations in latticed arrangement, a series of bushings each formed and removably fitted in a pair of said matched perforations so as to bridge said passage and connect said container with a core box on said table, and a series of plugs each having the form of a hollow cylinder closed at its top and having an opening through the side wall thereof providing an air passage, said plug being removably fitted in a pair of said matched perforations with said opening in registry with said passage between said plates and a screen closing the lower end of each of said plugs.

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