Inventors
John N. Demmler
and John Theodor Redin.
By
Mann, Brown and McWilliams.
Attys.
This invention relates to core blowing apparatus of the kind used for blowing molding sand into core boxes, molds and similar enclosures.

In sand blowing machines, the enclosure into which the sand is to be blown is supported beneath a blow plate through which sand is blown from a supply magazine, and to insure uniformity of distribution of the sand within the enclosure or core box it has been the practice to use different blow plates for different sizes of core boxes and the like. Blow plates used in such machines are quite large and heavy, and hence the coordination of the machine with different sizes of core boxes through substitution of blow plates has been difficult and the costs in both time and materials have been considered to be excessive.

In view of the foregoing it is the primary object of the present invention to enable the coordination of sand blowing machines with different sizes of core boxes and the like, and objects related to the foregoing are to enable such coordination to be attained quickly and easily and with the minimum of physical equipment; to enable different sizes of core boxes and the like to be fitted through the use of a single blow plate, to enable the effectiveness of the sand discharge openings of such a blow plate to be readily and easily controlled to adapt the blow plate for cooperation with different sizes of core boxes and the like, and to provide a blow plate assembly having the foregoing capabilities that may be easily and economically manufactured and maintained.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings, which, by way of illustration show a preferred embodiment of the present invention and the principles thereof, and what is now considered to be the best mode in which to apply these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the invention.

In the drawings:
FIG. 1 is a fragmentary and somewhat schematic front view of a core blowing machine embodying the invention;
FIG. 2 is an enlarged vertical section view of the magazine and the associated blow plate, the view being taken substantially along the line 2—2 of FIG. 3, but including certain structure from FIG. 1;
FIG. 3 is a top face view of the bottom plate of the blow plate assembly, the view being taken on the line 3—3 of FIG. 1;
FIG. 4 is an edge view of the upper plate of the blow plate assembly;
FIGS. 5 and 6 are top and bottom views, respectively, of the top plate of the blow plate assembly; the views being taken along the lines 5—5 and 6—6 of FIG. 4;
FIG. 7 is a perspective view of one of the control slabs; and
FIG. 8 is a fragmentary sectional view of the blow plate assembly taken in the location indicated by the line 8—8 of FIG. 3.

For purposes of disclosure the invention is here illustrated as embodied in a core blowing machine 20 in which an individual core box 21 may, by conventional operating means, be clamped between a lower platform 22 and a sand magazine 23, and pressure air supplied the magazine 23 serves as a carrier to discharge sand from the magazine 23 into the core box through a blow plate 25 that forms the bottom of the magazine 23. The blow plate 25 is remotely secured in position as the bottom wall of the magazine 23, as by clamps 23C, this being the usual manner of mounting that is employed to facilitate substitution of different blow plates for cooperation with different sizes of core boxes, but under the present invention the blow plate 25 is so constructed and arranged that the same blow plate 25 may be readily and easily coordinated with different sizes of core boxes 21 without removal or replacement of the blow plate.

Thus, the blow plate 25 is constructed so that it may be used with molds or core boxes 21 of substantially the same horizontal dimensions as the blow plate 25, and sand discharge openings 26 and vents 27 being provided in the blow plate 25 for effectually accomplishing the operation with respect to such large size molds or core boxes 21, and under the present invention means are provided whereby all or portions of selected sand discharge openings 26 may be disabled so as to coordinate the blow plate 25 with different sizes of core boxes 21.

As shown in FIGS. 2 to 8, the blow plate 25 is provided by a relatively heavy top or main plate 25T and a lower face plate 25B secured in face to face relation and having relatively large area vent passages 28 therebetween into which the vents 27 open, as will be described, and the sand discharge openings 26 open through the plates 25T and 25B in those areas that are located between the vent passages 28 so that the sand passages 26 are effectually isolated from the vent passages 28 and may communicate therewith only through the vent openings 27. In providing such structure the top plate 25T has its flat bottom face formed with a plurality of wide and relatively deep milled grooves 128 that are parallel and are spaced apart so that spaced lands 126 are provided therebetween. The ends of the milled grooves 128 are in effect opened by milling away the border portions of the lower face of the plate 25T to the same depth and to the edge of the plate as at 128E, while along the outer edges of the outermost lands 126, the border area of the plate 25T is milled away entirely to the edge of the plate and to the same depth as at 128B. The edges of the top plate 25T are beveled inwardly and downwardly at 123C for facilitating cooperation with the clamps 22C. The milled grooves 128 will thus define the vent passages 28 when the plates 25T and 25B are secured together, as will be explained, and the lands 126 serve to define the intermediate areas through which the sand passages 26 extend. In the present instance such sand passages 26 are in the form of relatively long slots as shown in FIGS. 3, 4 and 5, one slot 26T being formed through the top plate 25T in centered relation to each of the lands 126 so that the slot terminates short of the ends of its land 16, and aligned slots 26B are formed in the bottom plate 25B thus to complete the passages 26 through the two plates 25T and 25B. The taper shown in the slots 26 is preferred but is not considered essential. In those areas of the plate 25B that are to define the lower sides of the vent passages 28, as well as in the edge area 126B and the border area 126B, a succession of bores are formed in rows to provide the vents 27, and in the present instance two rows of such bores are formed in closely spaced relation so as to extend throughout and somewhat beyond the length of each vent passage 28. Similarly, one row of such bores is formed so as to be located opposite each of the border areas 126B. Each of the bores that is thus provided has a screen unit 27U therein, FIG. 2, each such unit comprising a rim 27R...
spanned at one end by a relatively fine screen 27S. The rim 27R is inserted with a snug or press fit into its bore so that the screen 27S is disposed substantially in the plane of the top plate 25T of the bottom plate 25B. The plates 2ST and 25B are secured together by means including a plurality of cap screws 31 that extend upwardly through the bottom plate 25B and are threaded into the top plate 25T at spaced points about the border of the assembly, the locations of the screws being indicated by the threaded bores 31T shown in the bottom surface of the top plate 25T in FIG. 5, and by the locations of the countersunk bores 31B in the bottom plate 25B in FIG. 3. Additional fastenings are provided by a row of cap screws 32, FIG. 8, that extend through the countersunk bores 32B, FIG. 3, in the bottom plate 25B and into threaded bores 32T in the milled grooves 126 near the midpoints thereof as shown in FIG. 5. Further securing means are provided by cap screws 33 that extend through the countersunk bores 33B in the bottom plate 25B and into threaded bores 33T that extend into the end portions of the lands 126 beyond the ends of the slots 26T as shown in FIG. 5.

The heads of the cap screws that are mounted in the countersunk bores 31B and 32B have their outer or lower end faces disposed in the plane of the face 125B as will be evident in FIG. 2, while the cap screws 33 have a different relationship as will be described.

Under the present invention means are provided for disabling all or any portion of the sand delivery slots 26B and as herein shown such means are provided by a plurality of elongated control slides 35 that are adapted to be inserted endwise into blocking or slot-closing positions at the lower ends of the sand delivery slots 26T. The control slides 35 are so arranged and related to the bottom plate 25B that when they are in position, the bottom surfaces 35B of the slides are located in the plane of the surface 125B. In providing for such a relation, supporting guideways are provided for slidably supporting the respective control slides 35, and as herein shown, the lower surfaces 35B of the plate 25B has undercut mounting slots 36 formed therein to provide such guideways. The slots 36B are somewhat wider than and form continuations of the slots 26B, and the mounting slots 36 extend throughout the entire width of the plate 25B and opening through opposite edges thereof.

The undercut slots 36 in the present instance are of dovetail form in cross section, and the control slides 35 have a corresponding cross sectional form so that they may be inserted endwise into the respective sand slots 26. Thus where a mold or core box 21 has an area less than that of the blow plate, those portions of the several sand supply slots 26 that are beyond or outside of the core box area may be blocked off by insertion of control slides 35 as shown in FIGS. 2, 3 and 8. Since the cap screws 33 are located on axes that intersect the several undercut grooves or slots 3C, the bores 33B are counterbored into the bottoms of the undercut slots 36 so that the outer ends of the heads of the screws 33 are flush with the bottoms of the slots 36.

When the control slides 35 are in position, their bottom faces 35B rest on the upper edge of the core box 21 so as to form a continuation of the bottom surface 125B of the plate 25B, and hence air or sand cannot escape from the core box through mounting slots 36. In this respect, it is important to note that even when the very largest size of core box 21 associated with a particular blow plate 25, the ends of the mounting slots 36 are preferably blocked by control slides 35 or short sections of such slides.

When the control slides 35 are in adjusted position for any particular size of core box 21, such slides merely disable those portions of the sand slots 26 that are not required, and because the vents 27 are distributed uniformly or symmetrically with respect to the slots 26, there will be a sufficient number of uniformly distributed vents 27 in communication with the core box 21 to assure proper and uniform distribution of the sand within the core box.

From the foregoing description it will be apparent that the present invention enables a single blow plate to be coordinated with different sizes of core boxes and the like so as to attain proper and uniform distribution of sand in such core boxes.

It will also be evident that the present invention provides a new and improved blow plate for core blowing and like machines whereby the problem of coordinating the machine with different sizes of core boxes is materially simplified.

Thus while a preferred form of the invention has been illustrated herein, it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appending claims.

We claim:

1. A blow plate assembly for core blowing and like machines comprising an upper plate and a lower plate secured in face to face relation with one of the engaged faces having spaced longitudinal grooves defining parallel vent passages therewith extending to the opposite edges of the plates and defining lands between adjacent passages, said upper and lower plates having aligned openings therethrough in the area of said lands providing sand supply openings, and said lower plate having scored vent openings therethrough into said vent passages, said lower plate having elongated mounting recesses in its lower face opposite at least certain of said sand supply openings, and elongated control slides supported in said recesses for longitudinal sliding movement for blocking and disabling selected sand openings.

2. A blow plate assembly for core blowing and like machines comprising an upper plate and a lower plate secured in face to face relation with one of the engaged faces having spaced longitudinal grooves defining parallel vent passages therewith extending to the opposite edges of the plates and defining lands between adjacent passages, said upper and lower plates having aligned sand supply openings therethrough in the area of said lands and said lower plate having scored vent openings therethrough into said vent passages, said lower plate having elongated mounting recesses in its lower face opposite at least certain of said sand supply openings, and elongated control slides supported in said recesses for longitudinal sliding movement for blocking and disabling selected sand openings.

3. A blow plate assembly for core blowing and like machines comprising an upper plate and a lower plate secured in face to face relation with one of the engaged faces having spaced longitudinal grooves defining parallel vent passages therewith extending to the opposite edges of the plates and defining lands between adjacent passages, said upper and lower plates having aligned sand supply slots extended therethrough parallel to and in the area of said lands and said lower plate having screened vent openings therethrough into said vent passages, said lower plate having mounting recesses in the form of undercut grooves cut therein opposite said lands and intersecting with the sand supply openings, said undercut grooves extending through at least one of the edges of said lower plate, and control slides complementary to said undercut grooves and insertable therein to disable all or part of the sand supply openings.

4. A blow plate assembly for core blowing and like machines comprising an upper plate and a lower plate rigidly secured together in parallel relation with vent space therebetween extending to the opposite edges of the plates, means providing sand supply openings extended through said upper and lower plates, and said lower plate having screened vent openings therethrough opening into
said vent space, said lower plate having mounting and supporting guideways intersecting with the sand supply openings, said guideways extending through at least one of the edges of said lower plate, and control slides complementary to said guideways and insertable therein to disable all or part of the intersected sand supply openings.

5. A blow plate assembly as defined in claim 4 wherein the lower faces of the control slides are located in the plane of the lower face of said lower plate.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>241,924</td>
<td>Buswell</td>
<td>May 24, 1881</td>
</tr>
<tr>
<td>949,974</td>
<td>Cibulka</td>
<td>Feb. 22, 1910</td>
</tr>
<tr>
<td>1,701,971</td>
<td>Chesson</td>
<td>Feb. 12, 1929</td>
</tr>
<tr>
<td>2,099,289</td>
<td>Anderson</td>
<td>Nov. 16, 1937</td>
</tr>
<tr>
<td>2,636,230</td>
<td>Morton</td>
<td>Apr. 28, 1953</td>
</tr>
<tr>
<td>2,789,325</td>
<td>McKee</td>
<td>Apr. 23, 1957</td>
</tr>
<tr>
<td>2,864,134</td>
<td>Harrison</td>
<td>Dec. 16, 1959</td>
</tr>
<tr>
<td>736,119</td>
<td>France</td>
<td>Sept. 12, 1932</td>
</tr>
<tr>
<td>987,532</td>
<td>France</td>
<td>Apr. 18, 1951</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>736,119</td>
<td>France</td>
<td>Sept. 12, 1932</td>
</tr>
<tr>
<td>987,532</td>
<td>France</td>
<td>Apr. 18, 1951</td>
</tr>
</tbody>
</table>

OTHER REFERENCES