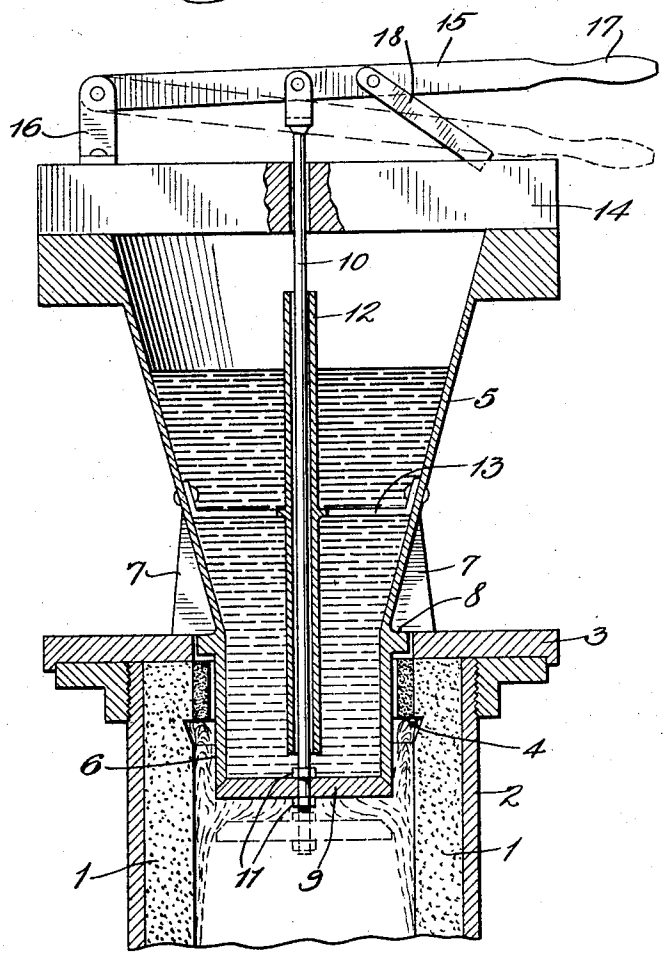
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MOLD FACING DEVICE

Filed March 5, 1926 2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

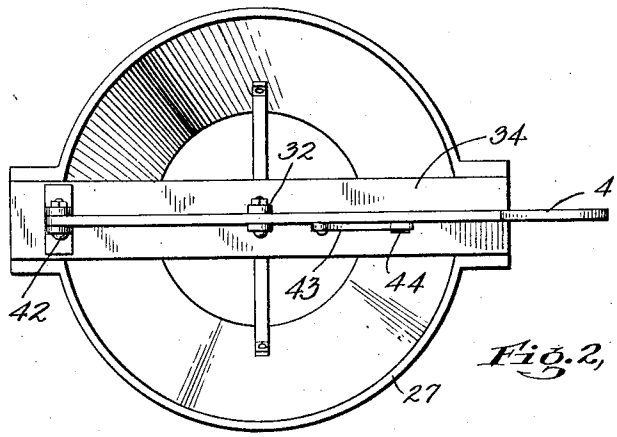
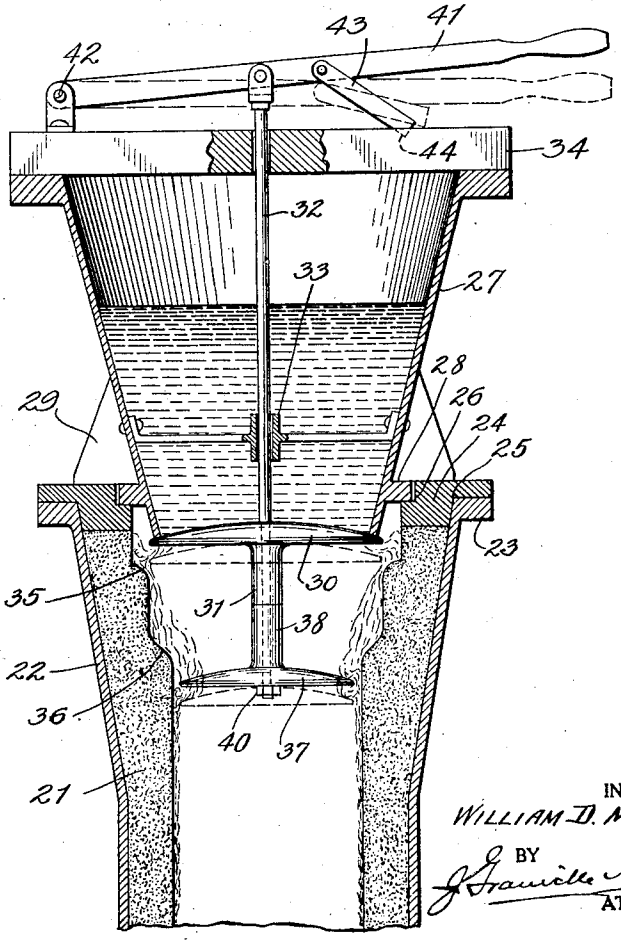


Fig. 2,

Fig. 3,



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UNITED STATES PATENT OFFICE.

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MOLD-FACING DEVICE.

Application filed March 5, 1926. Serial No. 92,452.

This invention is an improvement in mold facing devices, and more particularly in devices for automatically and uniformly distributing facings for refractory molds.

In the preparation of wet or green sand molds in accordance with the process set forth in application, Serial No. 33,704, filed on May 29, 1925, the mold is faced with a liquid emulsion of a carboniferous material, as the final step in the preparation.

Usually the facing is applied in emulsion. The emulsion is thrown from a pail or other suitable container into the mold, and a swirling motion is imparted to the emulsion by a skillful twist applied at the proper time, thereby to evenly and uniformly distribute the emulsion throughout the mold surface.

This method is entirely suitable and satisfactory for molds wherein the bores are uniform or substantially uniform in cross section. However, when the mold is of variable cross section, the method is not so satisfactory. As for instance in applying the facing from the spigot end the ring core or metal ring restricts the freedom of movement of the operator, and is an obstruction in the path of movement of the liquid as it is flung from the pail. The ring shields from the liquid a zone of the mold surface immediately adjacent to the ring, and of a width varying with the thickness and depth of the ring.

In molds for casting pipes with bell ends the flaring portion of the mold presents difficulties. This portion cannot be easily covered with the facing from the spigot end and when the facing is applied from the bell end, the variable cross section tends to deflect the facing material so that the portion of smaller diameter and uniform cross section is not uniformly covered.

One of the primary objects of the present invention is the provision of a simple, inexpensive device for automatically distributing the selected quantity of emulsion evenly and uniformly throughout the mold surface of molds wherein the bore is not of uniform cross section, as for instance in molds for casting bell end pipes.

Another object is the provision in such device, of means to constrain the flowing liquid to move in both directions longitudinally of the mold as it flows from the device, thereby to face that zone of the mold surface above the point of discharge of the emulsion.

Another object is the provision of means in such a device to correst deflections of the emulsion away from the mold wall due to the wall configuration.

Another object is the provision of a simple inexpensive device of the character specified, especially adapted for facing molds with bell ends from the bell end.

With these and other objects in view, the invention consists in the construction and novel combination of parts fully described hereinafter, illustrated in the accompanying drawings, and pointed out in the claims appended hereto, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims, may be resorted to without departing from the spirit of the invention.

In the drawings:

Fig. 1 is a vertical section of one embodiment of the invention.

Fig. 2 is a plan view.

Fig. 3 is a vertical section of another embodiment.

The embodiment of the invention illustrated in Figs. 1 and 2 is shown in connection with a mold 1 of sand, which may be of the character shown and described in the above mentioned application. The flask 2 in which the sand is held has at the spigot end of the mold a stripping plate 3, and a ring 4 of refractory material or metal is arranged within the end of the mold, just inside the stripping plate.

The improved device comprises a container or receptacle including a body 5 having a discharge nozzle 6 of uniform cross section and usually cylindrical. The body 5 is flaring or hopper shaped, and tapers towards the nozzle uniformly, gradually merging and becoming continuous with the nozzle, so that there is no obstruction of any character between the body of the container and the nozzle.

Substantially triangular wings or vanes 7 are secured to the body at suitable intervals, and these wings are adapted to rest at their lower ends on the stripping plate 3 as shown. The said lower ends of the wings are in the

same plane, and abut an annular flange 8 on the nozzle, at the junction of the body therewith.

The flange 8 is of a diameter to fit within the stripping plate, and the nozzle is of a length such that when the wings abut the stripping plate at their lower ends, the nozzle will extend into the mold, and to a distance below the ring 4. The external diameter of the nozzle is somewhat less than that of the ring 4, so that it passes easily through the ring core, or metal ring, and the thickness of the flange is less than that of the stripping plate, so that it does not engage the ring core, or metal ring.

The lower or discharge end of the nozzle may be closed by a disk valve 9, which has a diameter substantially equal to the external diameter of the nozzle. The abutting edges of the nozzle and valve are beveled as shown, this arrangement facilitating the downward flow of the emulsion. The valve is connected to the lower end of a rod 10, the rod being passed through the valve at its axis, and engaged by stops 11 above and below the valve. A guide tube 12 is provided for the rod, at the axis of the container, and the tube is supported by a spider 13 secured to the container wall. At its upper end the rod passes through an opening in a cross bar 14 to a swivel and pivotal connection with a lever 15. The lever is pivoted at one end between a pair of lugs 16 on the bar 14, and the other end is provided with a grip 17 as shown. The lever is also provided with pivotal latch mechanism 18 cooperating with the bar 14 to hold the grip end of the lever lifted and the valve closed.

In operation the device is seated in the upper end of the mold in the manner shown in Fig. 1, the nozzle passing through the ring core or metal ring, and the wings engaging the stripping plate. The flange 8 centers the nozzle, and it will be noticed that the flange will engage the stripping plate before the nozzle engages the refractory or metal ring 4. With the valve in the position of Fig. 1, and so held by the latch, the container is supplied with the correct amount of emulsion. When so supplied, the latch is released, and the lever is pushed down, moving the valve into the dotted line position of Fig. 1. The valve acts as a deflector or dasher directing the flow of liquid outwardly into contact with the mold wall. It also directs a part of the flow upward, the beveled edge serving in this capacity, so that every part of the mold surface is covered.

The embodiment of the invention illustrated in Fig. 3 is shown in connection with a mold 21 of sand, which may be of the character shown and described in the above mentioned application. In the present instance the mold is for casting pipes with bell ends, and the flask 22 in which the sand is held is flared for the end of the mold which forms the bell of the casting. This end is also marginally flanged as shown at 23, and the ring plate 24 is engaged with the flared end, the ring being rabbeted as shown at 25 to partially fit within the flanged end, and to rest upon the flange 23. The rabbet 25 is at the inner face of the ring and at the exterior, and the interior of the ring at the outer face is provided with another rabbet 26.

The improved device comprises a container or receptacle 27 including a body of tapering formation or hopper shaped, the small end of the container serving as the nozzle for delivering the emulsion. The small end of the body is of a size to pass through the ring 24, and the body has an annular rib 28 near the small end, which engages the rabbet 26, to properly center the container with respect to the flask and mold. The rib 28 is so placed that when engaged with the rabbet 26, the small end of the container will be just below the ring 23 and slightly below the meeting plane of the ring and mold end.

The body has substantially triangular wings or vanes 29 at suitable intervals, and these wings are adapted to rest on the mold end and the ring 24 as shown. The said wing ends are in the same plane and are so placed with respect to the rib 28 that when the rib is fitted in the rabbet 26, the wings will abut the ring.

A valve is provided for closing the lower end of the container. This valve is in the form of a disk 30 having a hub 31 engaging a rod 32 which is mounted to slide axially of the container. The rod is guided by a spider 33, arranged near the lower end of the container, and a cross bar 34 near the upper end. Referring to Fig. 3 it will be seen that the upper face of the disk is of spherical configuration so that all the emulsion is deflected outwardly.

When the valve is open in the dotted line position of Fig. 3, the emulsion flows out and strikes the mold wall. The contour of the wall at this zone is substantially cylindrical with a rounded annular shoulder 35 just below the cylindrical portion. The emulsion is discharged with sufficient force to coat the mold wall as high as the ring 24, and the remainder of the emulsion flows downwardly in the manner shown.

There is a second ledge or shoulder 36 below the shoulder 35, and this ledge 36 is inclined as shown. The contour is such that the emulsion flowing down from the shoulder 35 is deflected by the shoulder 36 inwardly, and were there nothing to correct this deflection, the coating of the wall would be defective. In order to correct the deflection at the shoulder 36, a valve or deflector 37 is supported by the rod 32 below the valve 30. This deflector has a hub 38 which

abuts at its end the hub 31 before mentioned, and the hubs are of a length to space the deflector 37 from the deflector 30 a distance such that when the valve 30 is open, the deflector 37 will be just below the shoulder 36.

The upper face of the deflector 37 is rounded as shown, so that the emulsion striking thereon is all deflected outwardly toward the mold wall, as clearly shown in Fig. 3. Thus the deflector acts to correct abnormal deflections caused by the mold wall configuration. The construction enables bell end molds to be evenly and uniformly covered with the facing material at a single operation.

The rod 32 passes through the hubs 31 and 38, and is engaged by a nut 40 at its lower end. Above the bar 34, the rod 32 is connected with a lever or handle 41 intermediate the ends thereof. The lever is pivoted at one end of the bar as indicated at 42, and the other end is formed into a grip for convenience in manipulating the lever. In order to hold the valve closed during the positioning of the device, a latch bar 43 is pivoted to the lever. This latch is adapted to engage a notch 44 in the bar 34 to hold the valve 30 closed. It will be obvious that when the latch is so engaged, the lever will occupy the full line position of Fig. 3, and the valve will be held closed.

The container is seated on the mold in the manner shown in Fig. 3. The valve 30 is closed, and the latch is operated to hold it closed. A suitable quantity of the emulsion is placed in the container. When now the latch is released the valve is forced open, and the emulsion flows out as indicated in Fig. 3. That portion thereof which is deflected inwardly by the ledge 36 is deflected outwardly by the valve or deflector 37, and the mold wall is thoroughly and evenly coated with the emulsion.

It will be evident that with the parts arranged in the dotted line position of Fig. 3 the emulsion might be thrown directly into the container and would be perfectly distributed, without the necessity of any manipulation of the deflectors 30—37. The invention contemplates in its broadest aspect, the provision of deflectors one or more in number so arranged as to correct deflections of the facing emulsion from the mold wall by variations in the cross section of the mold.

I claim:

1. Apparatus for applying liquid facing to a refractory mold, having a bore of variable cross-section, including a container having an outlet and means to engage the mold to center the outlet with respect thereto, and a deflector for each portion of the mold of larger diameter so disposed with respect to the container and outlet that when the outlet is open the deflector will be adjacent said portion of larger diameter and in position to deflect the liquid flowing from said portion outwardly.

2. Apparatus for applying liquid facing to a refractory mold, having a bore of variable cross-section, including a container having an outlet and means to engage the mold to center the outlet with respect thereto, and a deflector for each portion of the mold of larger diameter so disposed with respect to the container and outlet that when the outlet is open the deflector will be adjacent said portion of larger diameter and in position to deflect the liquid flowing from said portion outwardly, one deflector serving as a valve to close the outlet.

3. Apparatus for applying liquid facing to a refractory mold, having a bore of variable cross-section, including a container having an outlet and means to engage the mold to center the outlet with respect thereto, and a deflector for each portion of the mold of larger diameter so disposed with respect to the container and outlet that when the outlet is open the deflector will be adjacent said portion of larger diameter and in position to deflect the liquid flowing from said portion outwardly, one deflector serving as a valve to close the outlet, the deflectors connected in rigidly spaced relation.

4. Apparatus for applying liquid facing to a refractory mold, having a bore of variable cross-section, including a container having an outlet and means to engage the mold to center the outlet with respect thereto, and a deflector for each portion of the mold of larger diameter so disposed with respect to the container and outlet that when the outlet is open the deflector will be adjacent said portion of larger diameter and in position to deflect the liquid flowing from said portion outwardly, each deflector corresponding in outline substantially to cross-section of the mold.

5. Apparatus for applying liquid facing to refractory molds having refractory ring cores at the pouring end, comprising a nozble of uniform cross section, and of dimensions to pass through the ring and extend into the mold, and a receptacle for the liquid tapering smoothly toward the nozzle, and forming a continuation thereof, a manually operable valve for closing the nozzle, and means on the receptacle to engage the flask stripping plate to limit the inward movement of the nozzle.

6. Apparatus for applying liquid facing to refractory molds having refractory ring cores at the pouring end, comprising a nozzle of uniform cross section, and of dimensions to pass through the ring and extend into the mold, and a receptacle for the liquid tapering smoothly toward the nozzle, and forming a continuation thereof, a manually operable valve for closing the nozzle, and means on the receptacle to engage the flask

stripping plate to limit the inward movement of the nozzle, the nozzle having means to cooperate with the stripping plate to center the nozzle with respect to the mold.

7. Apparatus for applying liquid facing to refractory molds having refractory ring cores at the pouring end, comprising a nozzle of uniform cross section, and of dimensions to pass through the ring and extend into the mold, and a receptacle for the liquid tapering smoothly toward the nozzle, and forming a continuation thereof, a manually operable valve for closing the nozzle, and means on the receptacle to engage the flask stripping plate to limit the inward movement of the nozzle, said valve of a diameter co-extensive with that of the nozzle, and acting as a deflector for deflecting the outflowing liquid laterally and upwardly.

8. Apparatus for applying liquid facing to refractory molds having refractory ring cores at the pouring end, comprising a nozzle of uniform cross section, and of dimensions to pass through the ring and extend into the mold, and a receptacle for the liquid tapering smoothly toward the nozzle, and forming a continuation thereof, a manually operable valve for closing the nozzle, means on the receptacle engaging the flask stripping plate to limit the inward movement of the nozzle, and releasable means to hold the valve closed.

9. Apparatus for applying liquid facing to refractory molds, having refractory ring cores, comprising a nozzle of dimensions to fit loosely in the ring and to extend beyond the same into the mold, a receptacle tapering toward the nozzle and forming a continuation thereof, the receptacle having means to engage the flask to limit the movement of the nozzle into the mold, and a manually operable combined valve and distributor for closing the nozzle.

10. Apparatus for wet facing molds, including a receptacle having a discharge nozzle of uniform cross section, the receptacle tapering smoothly toward the nozzle and merging therewith, a valve for the nozzle closing against the end thereof, and means to operate the valve.

11. Apparatus for applying liquid facing to refractory molds, including a receptacle, having a nozzle to extend into the mold, said nozzle having a normally closed annular discharge port, and means on the receptacle to engage the mold to limit the inward movement of the nozzle.

12. Apparatus for applying liquid facing to refractory molds, including a receptacle having a nozzle to extend into the mold, and means in connection with the nozzle to provide an annular discharge, said means including a disk valve closing against the end of the nozzle and serving as a deflector to discharge a portion of the liquid lateral to its normal flow and means for operating the valve.

13. Apparatus for applying liquid facing to refractory molds, including a receptacle having a nozzle to extend into the mold and open at the end remote from the receptacle and a disk valve to close the open end.

Signed at Birmingham, in the county of Jefferson, and State of Alabama, this 2nd day of March A. D. 1926.

WILLIAM DAVIS MOORE.