

E. R. DUNSFORD.
MACHINE FOR FEEDING SAND TO MOLDING FLASKS.
APPLICATION FILED MAY 27, 1919.

1,329,459.

Patented Feb. 3, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

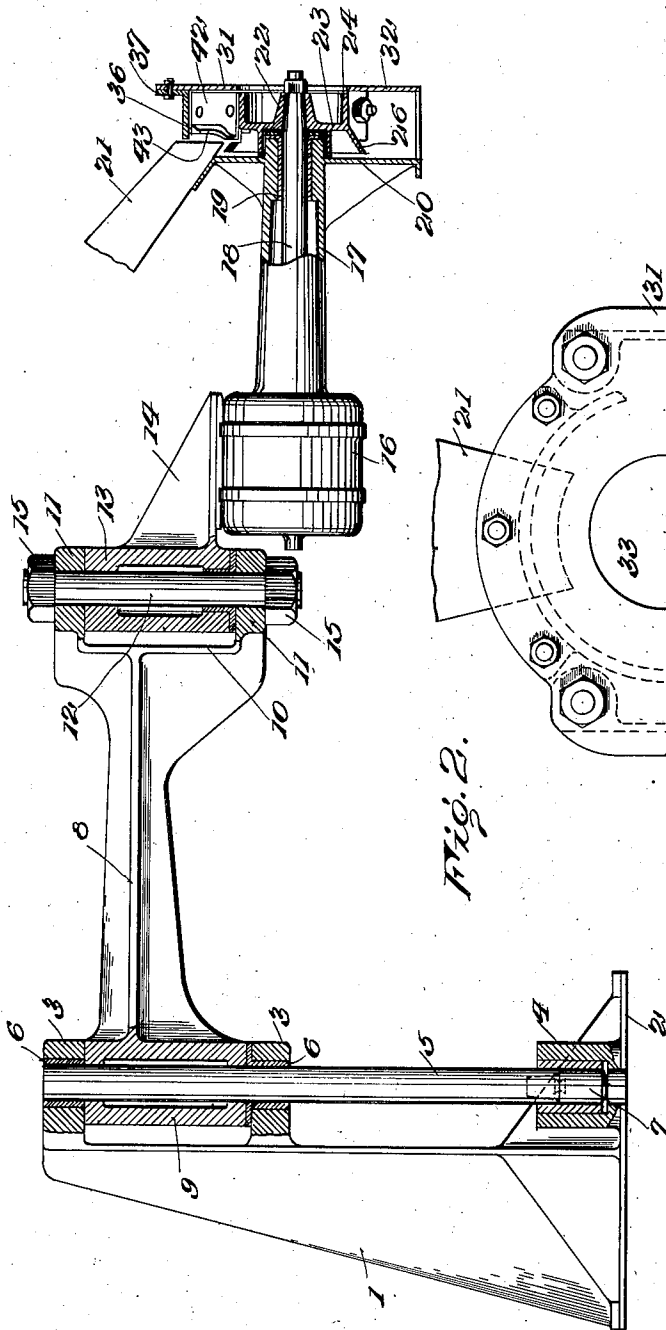
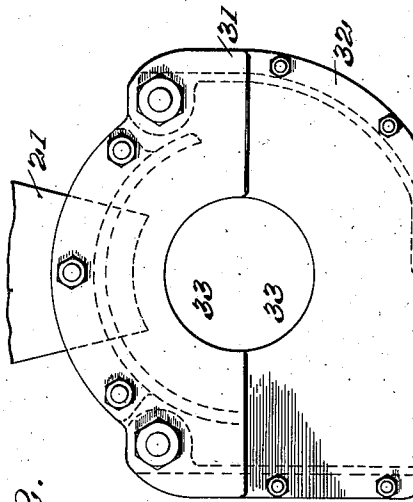


Fig. 2.

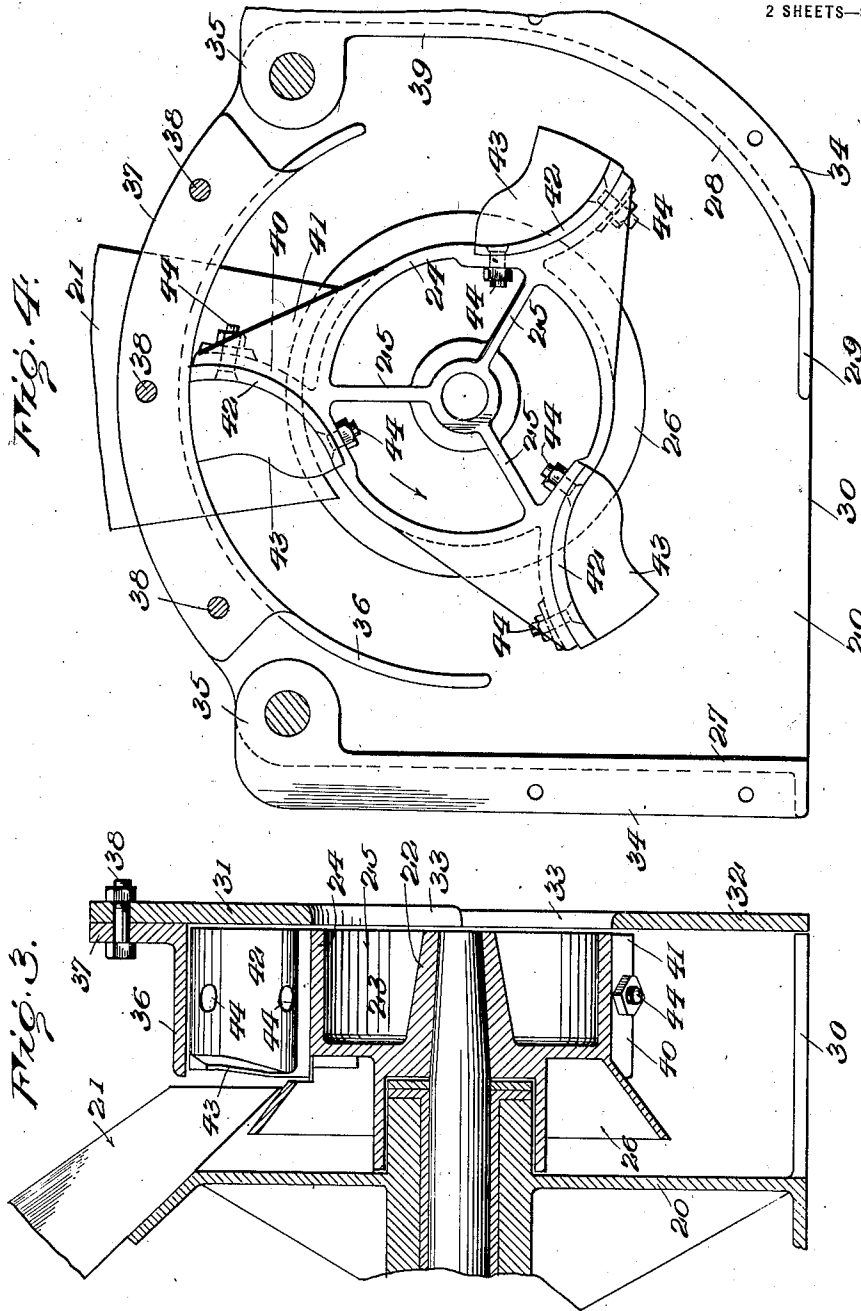


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UNITED STATES PATENT OFFICE.

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MACHINE FOR FEEDING SAND TO MOLDING-FLASKS.

1,329,459.

Specification of Letters Patent.

Patented Feb. 3, 1920.

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To all whom it may concern:

Be it known that I, EMEIS R. DUNSFORD, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Machines for Feeding Sand to Molding-Flasks, of which the following is a specification.

This invention relates to that type of machines or apparatus which are employed to feed sand to molding flasks and which supply the sand by centrifugal force at a high speed so that it will be firmly and compactly deposited and built up within the flask. The object of the present invention is to simplify the construction and improve the mounting of the machine whereby the cost of assembling and operating will be reduced and the feeding member more effectively balanced than is the case with prior machines and the sand fed to the mold more rapidly and evenly than heretofore.

The invention is illustrated in the accompanying drawings and will be hereinafter fully described, the novel features being subsequently pointed out in the appended claims.

In the drawings:

Figure 1 is a view partly in side elevation and partly in vertical section of an apparatus embodying my improvements;

Fig. 2 is a front elevation of that portion of the apparatus which acts directly on the sand;

Fig. 3 is an enlarged transverse section of the mechanism shown in Fig. 2;

Fig. 4 is an enlarged front elevation of the same with the cover plate removed and some of the securing bolts shown in section.

In carrying out my invention, I employ a pedestal 1 which is constructed with a suitable base 2 adapted to be secured to a rigid or fixed support and may be permanently bolted or otherwise anchored to the floor of the molding room. This pedestal is provided on one side with the forwardly projecting arms 3 and with a cup 4, said members constituting supports for a post or vertical shaft 5 which may be secured in the pedestal but will preferably be mounted for rotation within the arms 3 and in the cup 4, bushings 6 being provided in the arms 3 and a step bearing 7 being provided in the cup 4 to receive the thrust. Secured to or pivotally mounted upon the member 5 is an arm 8 having its rear end constructed

with a hub or sleeve 9 to encircle the post or shaft 5 and having its front end formed into a yoke 10 providing upper and lower bearing members 11 to receive a bolt or rod 12 upon which is pivotally mounted a sleeve or hub 13 upon the rear end of the motor support 14, the said hub being fitted between the members 11, as clearly shown in Fig. 1, and securing nuts 15 being mounted upon the ends of the pin or rod 12 and turned home against the bearing members 11 to secure the said rod firmly in place. A motor 16, preferably driven by electricity, is secured to the support 14 and the casing of said motor is constructed with an elongated sleeve or hollow supporting arm 17 which projects forwardly therefrom and incloses the motor shaft 18. A bushing 19 is fitted in the outer end of the sleeve or housing 17 to furnish a proper bearing for the motor shaft and upon the outer side of the said sleeve 17, at the front end thereof, I secure or form the back wall 20 of a casing within which the feeding member rotates. A chute or hopper 21 is secured upon the upper portion of the back wall 20 and the sand is fed into the said chute or hopper by any convenient form of conveyer, which is not illustrated herein as it forms no part of my present invention. It is to be understood that the hopper or chute should be of such dimensions or so connected with the conveyer that the shifting of the feeding elements to properly position the sand within the molding flasks will not interfere with the proper delivery of sand to the chute or hopper. Secured firmly to the front extremity of the motor shaft 18 is the hub 22 of a disk or other rotary member 23 which disk is provided at its periphery with a forwardly projecting rim or annular flange 24 which is reinforced and strengthened by spokes or braces 25 extending between the said rim and the hub 22. The disk 23 also carries a deflector or sand directing member consisting of a rearwardly flared ring 26 extending from the periphery of the disk, as shown clearly in Figs. 1 and 3. This cone or rearward flared ring passes close to the mouth or discharge end of the hopper or chute 21 and, consequently, prevents the sand emerging from the chute or hopper being dropped in rear of the feeding member or disk and causes the same to be directed forwardly to be engaged by the sand throwing shoes. The end walls,

indicated at 27, of the casing are formed integral with and project forwardly from the back wall 20, one of said walls being vertical and the other wall having a lower curved portion, as indicated at 28, and terminating in a short horizontal floor or flange 29 which has its end or edge spaced from the lower extremity of the vertical straight end wall thereby providing a discharge opening 30 through which the sand may pass to the flask. The front wall of the casing consists of a cover plate which preferably consists of an upper member 31 and a lower member 32 having straight meeting edges which are adapted to abut in the horizontal plane of the motor shaft 18 and which are constructed with central concave notches or openings 33 corresponding in diameter to the diameter of the disk 23. This construction will expose the spokes 25 of the sand feeding member so that the operator may at all times observe the rotation of the said member and be informed as to the evenness of its action. It also provides ready access to the inner securing bolts by which the sand-throwing shoes are secured in position. The cover plates conform in outline to the end walls of the casing and are secured thereto by bolts passing through their edges and through flanges 34 on the end walls. At the upper extremities of the end walls, I provide inwardly projecting bosses 35 through which other fastening bolts are inserted to secure the upper portion of the cover plate in position. The top of the casing is covered by a shield consisting of an arcuate web 36 having a vertical flange 37 at its front edge fitting against the upper cover plate 31 and secured thereto by bolts 38. The flange 37 terminates adjacent the bosses 35 and the rear edge of the web 36 is disposed close to the mouth of the chute or hopper 21 so that the liability of sand flying over or beyond the sand-throwing member will be minimized. The web 36, as shown most clearly in Fig. 4, terminates at one side adjacent the boss 35 but at its other side extends to the horizontal plane of the motor shaft so that it will serve as a guide for the sand and will prevent the same leaving the shoe until the shoe has reached a point vertically over the discharge opening 30. The curved end wall of the casing is provided with an opening 39 which will permit access to the upper securing bolts of the shoes and will also permit the insertion of a suitable tool should there be any accidental choking of the apparatus by reason of sand leaking past the shoes as the same move across the mouth of the hopper or chute.

At intervals around the rim 24 of the sand-throwing member, I provide the approximately radial curved arms 40 which

extend outwardly from the rim and are reinforced by ribs or webs 41 connecting their convex or rear faces with the rim 24. The sand-throwing shoes are carried by these arms and in the present embodiment of my invention I have illustrated three of such arms spaced equidistantly around the disk so that the disk will be balanced and will run easily and evenly without the employment of any additional weights or other counterbalances. The employment of three of said arms with the corresponding number of shoes is advantageous for the reason that the sand is carried around the wheel or feeding member through one-third of its rotation and by employing three shoes spaced equidistantly the sand is fed constantly instead of being fed only one-third of the time. A greater or less number of shoes, however, may be employed without departing from the principles of my invention as the same is defined in the appended claims.

While the convex faces of the arms 40 might be utilized as the sand engaging and throwing elements, I prefer to employ the shoes illustrated in the drawings. These shoes consist of arcuate base members 42 fitting closely against the concave surfaces of the arms 40 and provided at their rear edges with wings, flanges, or blades 43 which in the operation of the machine move across the mouth of the hopper or chute and cut through the sand so that the progress or rotation of the sand-throwing member will not be subjected to a partial check as would be the case if the face of the base member 42 were presented to the flowing sand. The shoes are secured to the rim 24 and the arms 40 by bolts 44 inserted through the rims and the said arms, as clearly shown.

It is thought the operation of the machine will be readily understood from what has gone before, but it may be briefly summarized. The disk or feeding member 23 is rotated in the direction of the arrow appearing upon Fig. 4 and will move at a high speed so that the passage of the shoes across the mouth of the hopper or chute 21 will be so rapid as to be practically continuous. As each shoe moves across the mouth of the hopper or chute it will cut off a portion of the sand and will force the same around through the conduit provided by the front and rear walls of the casing, the web 36 and the rim 24 of the rotary feeding member until the body of sand has nearly reached the terminal of the said web 36. The velocity of the shoes is such that the sand will require a very high momentum as it travels past the web 36 and will be thrown from the casing through the discharge opening 30 with great force so that by reason of its impact with the bottom of the flask, or the pattern, or the sand previously deposited in

the flasks, it will be very firmly seated so that a very firm mold will be rapidly formed and the mold cavity very accurately shaped. The jointed construction of the support for the sand-throwing or feeding mechanism permits the said mechanism to be moved over the area of the molding flasks and, consequently, the operator is enabled to govern the discharge of the sand so that it will be deposited at such points within the flask as it may be needed. The construction devised by me reduces the number of parts which have heretofore been found necessary in building machines for feeding sand centrifugally into molding flasks and thereby facilitates the setting up or disassembling of the machine and reduces the cost of installing and maintaining the machines. Moreover, the construction which I employ permits the sand feeding or throwing elements to operate evenly at a higher speed than has heretofore been attainable and therefore reduces the cost of the molding operation by permitting the production of more molds within a given period.

Having thus described the invention, what is claimed as new is:

1. In mechanism for the purpose set forth, the combination of a jointed support, a motor carried by said support, a casing connected with said support, and a sand-throwing member disposed within said casing and operatively connected with the motor.

2. In an apparatus for the purpose set forth, the combination of a rigid supporting member, a laterally extending arm mounted on said support for swinging movement, a motor support carried by the outer end of said arm and arranged to have swinging movement relative thereto, a motor, and a sand-throwing member operatively connected with said motor, both carried by the motor support.

3. In an apparatus for the purpose set forth, the combination of a pedestal, bearing arms projecting from said pedestal in spaced relation, a cup disposed at the base of the pedestal, a step bearing in said cup, a pivot member mounted in the spaced bearing arms and fitting within said cup to be supported by the step bearing, a laterally extending arm fitted upon said pivot member between the spaced bearing arms for lateral swinging movement, a yoke at the free end of said arm, a motor carrier having a hub member fitted within said yoke, means for securing said hub within the yoke for swinging movement, a casing secured to the motor carrier, a motor mounted within the said casing, and a sand-throwing member also mounted within the casing and operatively connected with the motor.

4. In an apparatus for the purpose set forth, the combination of a casing having a discharge opening in its bottom, means

for supplying sand at the top of the casing, and means for forcibly projecting the sand from the casing comprising a rotatable member, and a plurality of equidistant sand-engaging elements carried thereby.

5. In an apparatus for the purpose set forth, the combination of a casing having a discharge opening, means for supplying sand to the casing at a point remote from the discharge opening, and means for engaging the said sand and forcibly projecting it through the discharge opening comprising a rotatable member mounted within the casing and provided with equidistant outwardly projecting arms and shoes secured upon the advancing faces of said arms.

6. In an apparatus for the purpose set forth, the combination of a casing, means for supplying sand to said casing, and means for forcibly projecting the sand from the casing consisting of a plurality of sand-engaging elements arranged to move past the sand-feeding means, and means for rapidly and successively moving said elements past the sand-feeding means.

7. In an apparatus for the purpose set forth, the combination of a casing having a discharge opening at one side and having one wall formed by a web having one terminal disposed to guide sand to the discharge opening, means for feeding sand at an intermediate point of said web, and a plurality of sand-engaging elements movable successively and rapidly past the sand-feeding means and the discharge opening.

8. In an apparatus for the purpose set forth, the combination of a casing, means for feeding sand thereto, and a sand-throwing means comprising a member mounted for rotation within the case, and a plurality of shoes secured upon the periphery of said rotatable member and comprising an arcuate web disposed approximately radial to the member, and a wing at the rear edge of said web extending therefrom in the direction of movement.

9. In an apparatus for the purpose set forth, the combination of a casing, a chute supported on and extending into the casing, a rotatable member mounted in the casing and having a rearwardly flared ring extending under the said chute, and sand-throwing members carried by said rotatable member and movable past the chute.

10. In an apparatus for the purpose set forth, the combination of a casing comprising a rear wall and end walls projecting forwardly therefrom, one of said end walls being provided with an opening, a cover secured to the said end walls and forming the front of the said casing, a top plate secured to said cover and extending rearwardly from the cover, said top plate comprising an arcuate web having its terminals dis-

posed below the upper ends of the end walls, a chute arranged to deliver sand between the rear edge of said web and the rear wall of the casing, and a rotatable member mounted
5 within the casing and provided with a sand-throwing element extending to the said web and movable past the sand-feeding means.

11. In an apparatus for the purpose set forth, the combination of a casing having

an open bottom and provided with a top 10 plate having its ends disposed between the end walls of the casing, a rotatable member mounted within the casing and provided with an approximately radial arm project-
ing close to the top plate, and a shoe remov- 15 ably secured to said arm.

In testimony whereof I affix my signature.

EMEIS R. DUNSFORD. [L. s.]