April 24, 1928.

1,667,097

E. O. BEARDSLEY ET AL

MACHINE FOR FILLING MOLDS

Filed Feb. 28, 1924

2 Sheets-Sheet 1

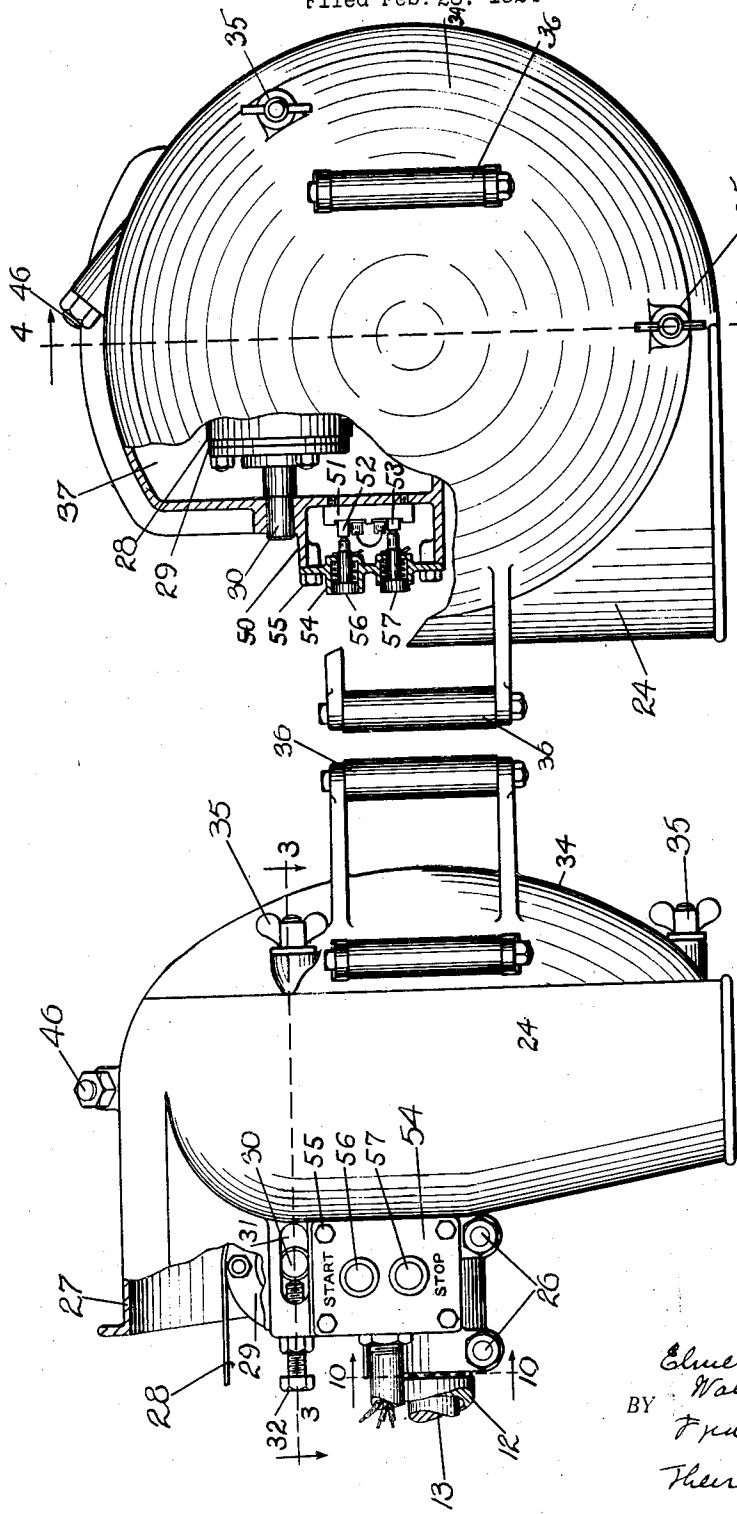


Fig.1.

Fig.2.

INVENTOR.
Elmer O. Beardsley &
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BY Fred Gerlach
Their ATTORNEY.

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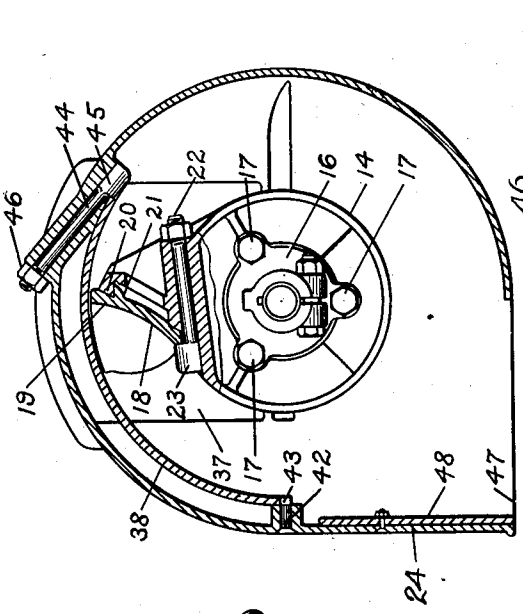


Fig. 6.

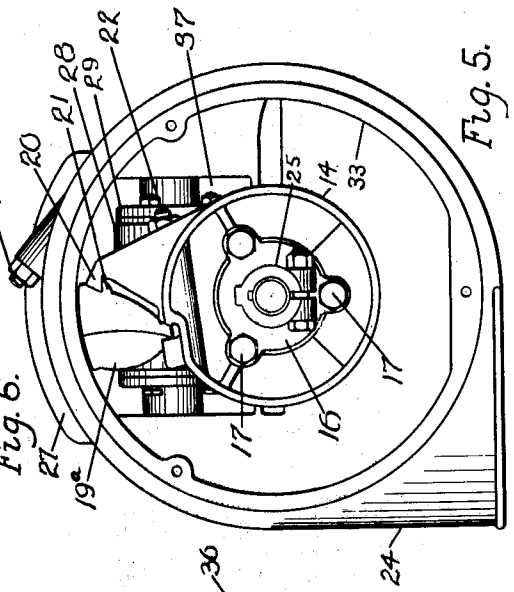


Fig. 5.

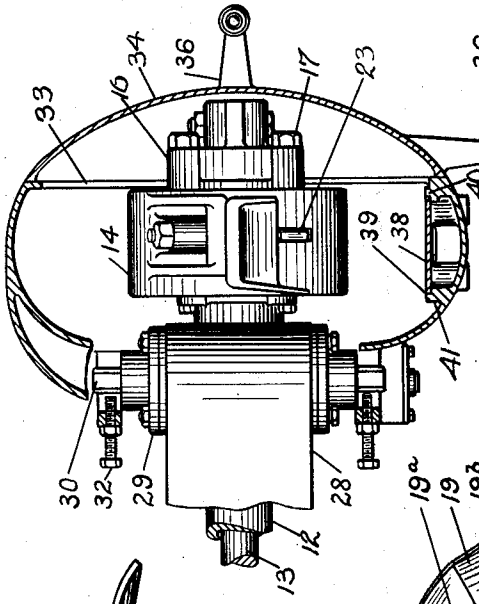


Fig. 3.

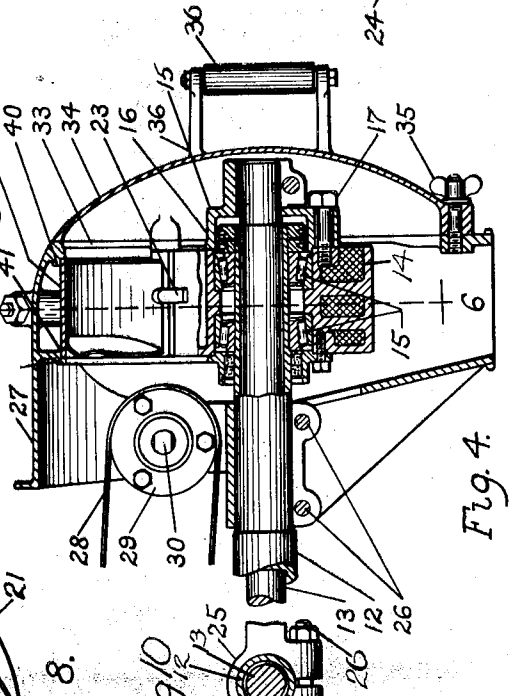


Fig. 4.

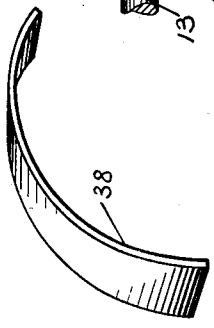


Fig. 7.

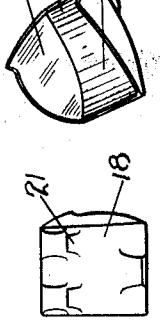


Fig. 8.

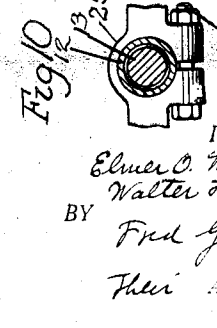


Fig. 10

Fig. 9

INVENTOR.

Elmer O. Beardsley &
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BY Fred Gerlach

Their ATTORNEY.

Patented Apr. 24, 1928. 1,667,097

UNITED STATES PATENT OFFICE.

ELMER O. BEARDSLEY AND WALTER F. PIPER, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE BEARDSLEY & PIPER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR FILLING MOLDS.

Application filed February 28, 1924. Serial No. 695,705.

The invention relates to improvements in machines for filling molds and more particularly to that type in which wads of material, such as sand, are projected at high speed into the flasks containing the patterns.

In Patent No. 1,309,833 granted to us July 15, 1919, the casing or stator is provided with an arcuate peripheral wall and an integral side wall which cooperate with a rotary projector having a shear blade at one side thereof to form, pack and sling densified wads of sand into flasks beneath the projector. In practice, these parts are subjected to great wear, and one object of the invention is to provide an improved projector-head in which this wear is minimized and in which provision is made for replacement of only that portion of the stator or casing which is subjected to great wear.

A further object of the invention is to provide an improved construction for supporting and enclosing the rotor of the projector-head. Other objects will appear from the detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by the claims at the conclusion hereof.

In the drawings: Fig. 1 is a side elevation of a projector embodying the invention. Fig. 2 is a front elevation, parts being broken away to show the box for the motor switch. Fig. 3 is a section taken on line 3—3 of Fig. 1. Fig. 4 is a section taken on line 4—4 of Fig. 2. Fig. 5 is a front view, the casing end or cover being removed to provide access to the rotor. Fig. 6 is a section taken on line 6—6 of Fig. 4. Fig. 7 is a detail perspective of the removable liner. Fig. 8 is a perspective of the propeller blade. Fig. 9 is a rear view of said blade. Fig. 10 is a section taken on line 10—10 of Fig. 1.

The invention is exemplified in a machine comprising a tubular supporting arm 12 which is usually pivoted to the distal end of a horizontally swinging jib, as exemplified in our Patent No. 1,309,833, to permit the projector-head to be moved horizontally over all portions of a flask; a shaft 13 in and extending through said tubular arm and usually driven by a motor at the inner end of said arm; a rotor comprising a body 14, which is revolubly supported by roller bearings 15 between the hub of said body and tubular arm 12 and is connected so as to be driven from the shaft 13 by a collar 16 which is split and keyed and clamped to the outer end of shaft 13 and to which the rotor-body is secured by bolts 17. A projector-member 18 comprises a curved tangential blade 19 which is removably secured to the rotor-body 14 by interengaging lugs or hooks 20 and 21 on the body and blade respectively and a bolt 22 in said body and having a head 23 adapted to hold said lugs in engagement, as more particularly exemplified in Patent No. 1,476,135 granted to us December 4, 1923.

The casing or stator comprises a shell-like body 24 which has an integral split hub 25, which is clamped to the tubular arm 12 by bolts 26 to secure the casing in fixed relation to and on said arm. The body-member of the casing is provided with an integral open ended hood 27. Sand is delivered to the casing by an endless belt 28 which passes around a pulley 29, which has a shaft 30 which is held in slots 31 formed in the casing-body. Screws 32 are adapted to position the shaft 30 in said slots and to keep the belt taut. This belt may be operated and supplied with sand, as exemplified in our Patent No. 1,408,493 dated March 7, 1922. The front of the casing-body is provided with an opening 33 of sufficient diameter to provide access to the rotor and to permit the removal and replacement thereof through the opening. A concave convex cover 34, secured to the casing body by bolts 35, closes said opening. Handles 36 for manipulating the projection-head over a flask are provided on said cover. That portion of the casing or stator which coacts with the rotary projector-member 18, to form and densify the wads and to confine the sand from the point where it is delivered through opening 37, is formed by a cylindrical liner 38 which is usually formed of hard metal, such as high carbon steel. This liner has its margins fitted in grooves 39 which are formed in ribs 40, 41 which extend inwardly from, and are integral with, the casing-body 24. The liner is removably secured in said grooves by a rivet 42 which is provided with a head 43 to serve as an abutment for one end of the liner and a bolt 44 which extends obliquely through

the casing-body 24, is provided at its inner end with a head 45 to engage the other end of the liner and at its outer end with a nut 46 to hold the liner in said grooves with its other end against abutment 43. This liner has no sides and forms only the peripheral portion of the casing which coacts with the rotor in forming and projecting wads. At the delivery side of the casing, the projector member 18 is provided with a blade 19^a which serves to shear sand from the stream fed into the casing and to prevent rearward displacement of the sand. At its other side, the projector-member 18 is provided with a blade or member 19^b which is adapted to prevent forward displacement of the sand from said member. Both the front and rear sides of the projector-member are clear or spaced from the casing, no coacting portions being necessary there when the projector-member 18 is provided with blades for confining the sand against both rearward and forward displacement. This construction avoids wear at both sides of the projector-member 18, which in practice rotates at a high speed. By providing a liner without sides to coact with member 18 and making it readily removable from the casing, the cost of maintenance is reduced, because the liner is used only where wear occurs and replacement becomes necessary. The liner terminates approximately in the horizontal plane of the axis of the rotor, so that the wads of sand will be released at that point and discharged through an opening 47 in the bottom and at one side of the casing. A wear-plate 48 is usually provided at one side of said opening.

In practice, it is desirable to have the switch for controlling the motor for driving the rotor and belt 28 readily accessible to the operator manipulating the projector-head over the flask and to enclose it, so that loose sand will be excluded. For this purpose, a box 50 is integrally formed with and at one side of the casing-body 24. A plate of insulation 51 is secured in said box and terminal strips 52 and 53, which are suitably connected to the circuit controlling the motor for driving shaft 13, are fixed to said plate. A cover 54 is movably secured to close said box by bolts 55. Start and stop buttons 56 and 57 are suitably mounted in said cover. This construction exemplifies one in which the box for the switch controlling the motor is enclosed, so as to exclude dust and integrally formed with the casing of the projector-head.

In operation, belt 28 will continuously feed sand through opening 37 to the rotor and the latter will be operated at a high speed. In the operation of the rotor, the shear-blade 19^a will slice portions of sand from the stream being delivered, and centrifugal force and the direction of projector-blade 19 will cause it to be densified against the liner 38 while the wads will be confined against displacement from the liner by blades 19^a and 19^b on the rotating member 18. When the wads reach the end of the liner, they will be densified and then projected through the opening 47 into the flask.

The invention exemplifies a projector-head, in which the rotor is provided with a member having sides between which the sand will be confined and a peripheral casing-member or liner, so that it is only necessary to replace a cylindrical portion of the casing; in which the casing is provided with means whereby it may be directly secured to the supporting arm; in which the casing is formed of a one-piece body and a removable cover which permits ready access to the rotor in the casing for inspection, removal or replacement; in which the rotor is spaced from the casing at all points except where a coacting peripheral portion is necessary, so that any loose sand does not interfere with the free rotation of the rotor; in which the liner is formed so that it can be readily machined to its correct form; in which the casing is formed so that loose sand will not be collected therein; in which the switch-box is conveniently disposed and protected from sand; and in which the casing is provided with an integral hood for the sand adjacent the delivery end of the sand-feeding belt.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a projector for filling flasks, the combination of a casing provided with an arcuate, cylindrical portion and a rotor having open sides and a projecting member in coactive relation with said portion, and provided with means rigid therewith at both sides for confining the sand therebetween, said means being substantially spaced from the casing.

2. In a projector for filling flasks, the combination of an arm, a casing fixed to said arm and provided with an arcuate cylindrical portion, a rotor having open sides and a projecting member in coactive relation with said portion and provided with sides rigid therewith for confining the sand between them and on the cylindrical portion, and substantially spaced from the casing.

3. In a projector for filling flasks, the combination of a casing provided with an arcuate cylindrical liner removably secured therein, a rotor having open sides and a projecting member in coactive relation with

said liner and provided with means rigid therewith at both sides for confining the sand on the member and said liner, said means being substantially spaced from the casing.

4. In a projector for filling flasks, the combination of a casing provided with an arcuate cylindrical liner, means to fixedly and removably clamp said liner in the casing comprising a bolt operable from the outside of the casing, a rotor having open sides a projecting member in coactive relation with the liner, the liner being provided with means at both sides for confining the sand on said member and liner, said means being substantially spaced from the casing.

5. In a projector for filling flasks, the combination of an arm, a casing provided with means whereby it may be directly secured to said arm, means for feeding sand to the casing comprising a pulley and a belt, bearings for the pulley in an integral part of the casing, a rotor in said casing and removable therefrom while the casing is secured to said arm, and means for driving the rotor.

6. In a projector for filling flasks, the combination of an arm, a casing provided with means whereby it may be directly secured to said arm, means for feeding sand to the casing comprising a pulley and a belt, the casing having integral portions with slots therein for the shaft of said pulley, a hood integral with the casing and extending over said belt, a rotor in said casing and removable therefrom while the casing is secured to said arm, and means for driving the rotor.

7. In a projector-head for filling flasks, the combination of an arm, a casing secured at one of its ends to said arm provided with an integral hub secured to said arm, and a rotor in said casing, the latter comprising an integral body around the operative portion of the rotor and terminating adjacent one end thereof, and having an opening at said latter end thereof through which the rotor may be inserted and removed from the casing while the casing is secured to the arm and a removable cover for said opening.

8. In a projector-head for filling flasks, the combination of a supporting arm pivoted adjacent one of its ends to swing horizontally, a casing secured on said arm, a rotor in said casing, the latter comprising an integral body around the entire operative portion of the rotor and terminating adjacent one end thereof, and a removable liner coacting with and outside of the rotor, the casing having an opening at said latter end through which the rotor may be inserted and removed from the casing and a removable cover for said opening.

9. In a projector-head for filling flasks, the combination of a supporting arm pivoted adjacent one of its ends to swing horizontally, a rotor provided with a projecting member, a casing secured at one of its ends to said arm and comprising an integral annular body around the rotor and having an opening at its other end through which the rotor may be inserted and removed from the casing and a removable cover for said opening, a one-piece removable liner fixedly held in coactive relation with the projecting member and disposed entirely in said body, means for feeding sand to the rotor and means to drive the rotor, said liner being removable through said opening.

10. In a projector-head for filling flasks, the combination of a supporting arm pivoted adjacent one of its ends to swing horizontally, a rotor provided with a projecting member, a casing secured at one of its ends to said arm and comprising an integral annular body around the rotor, and having an opening at its other end through which the rotor may be inserted and removed from the casing and a removable cover for said opening, a one-piece removable liner fixedly held in coactive relation with the projecting-member and disposed entirely in said body, said body being provided with a seat to receive the liner and in which it is held, means for feeding sand to the rotor, and means to drive the rotor, said liner being removable through said opening.

11. In a projector head for filling flasks, the combination of a movable support, a rotor provided with a projecting member, a casing secured at one of its ends to said support and having an opening at its other end through which the rotor may be inserted and removed from the casing, a shaft for driving the rotor extending into the other end of the casing, and a cover for said opening extended to enclose one side of the rotor and one end of the shaft.

12. A removable member for rotary sand projectors comprising a tangential blade, a shear blade at one side of and integral with the tangential blade and a retaining wall at the other side of and integral with the tangential blade, the member having integral surfaces adapted to be engaged by clamping means for removably securing it to a rotor-body.

Signed at Chicago, Illinois, this 6th day of February, 1924.

ELMER O. BEARDSLEY.
WALTER F. PIPER.