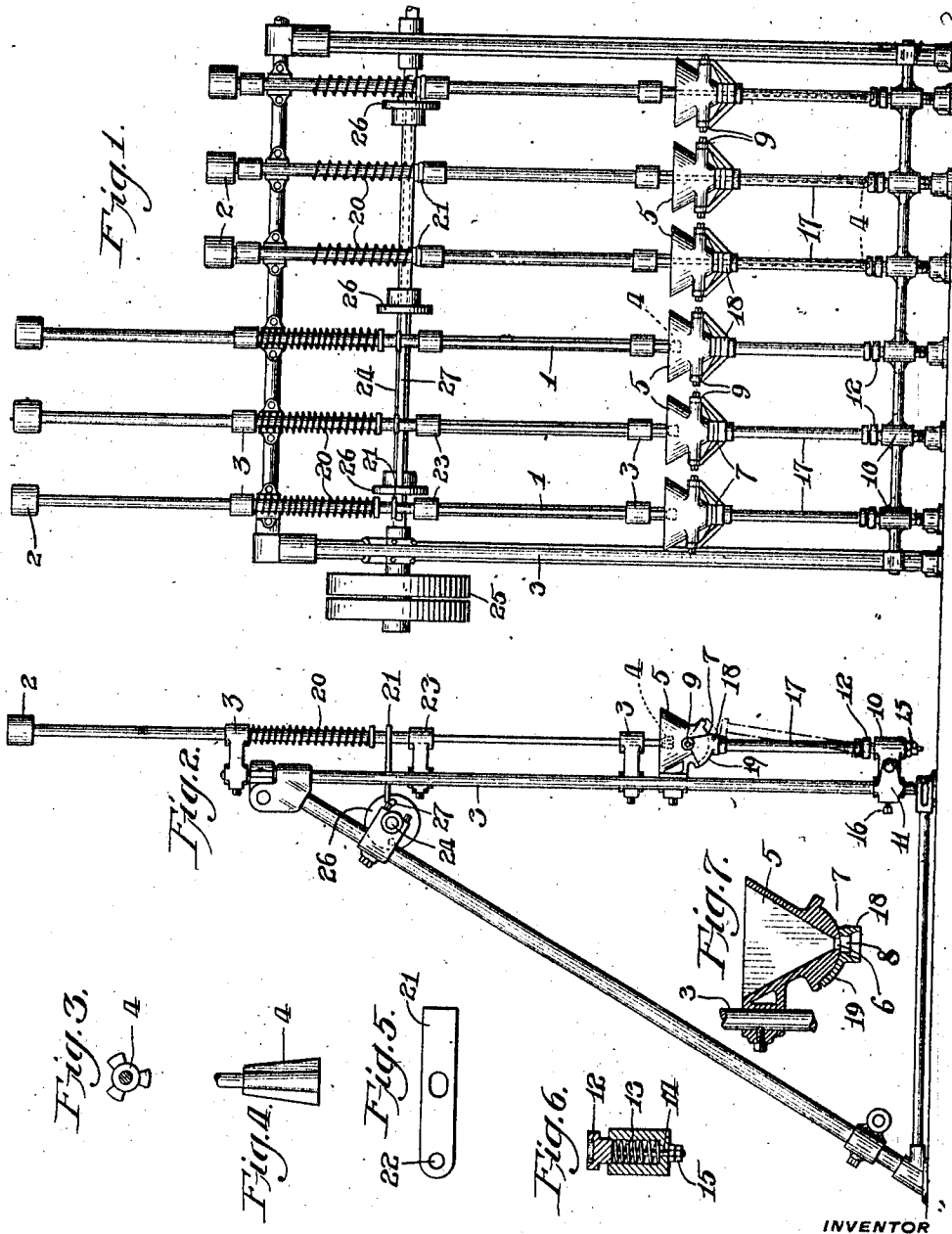


S. C. BOND.
MOLD FILLING MACHINE.
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1,059,267.

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MOLD-FILLING MACHINE.

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To all whom it may concern:

Be it known that I, SAMUEL C. BOND, a citizen of the United States, and a resident of Hollyoak, Newcastle county, State of Delaware, have invented certain new and useful Improvements in Mold-Filling Machines, of which the following is a specification.

My invention relates to improvements in devices for filling molds with granular substances, more particularly treated ground cork, and the objects of my invention will be hereinafter more fully set forth.

In the accompanying drawings, in which similar letters of reference indicate similar parts throughout the several views:—Figure 1, is a front elevation of a battery of mold filling machines embodying my improvements. Fig. 2, an end elevation of Fig. 1; Fig. 3, a plan and Fig. 4, a side elevation of the packer for packing the cork in the molds; Fig. 5, a plan of clutch for lifting the rods carrying the packers; Fig. 6, a central sectional elevation of the spring supported foot for carrying the molds during the operation of packing. Fig. 7, a central sectional elevation through the hoppers, connected with the upper ends of molds, when the latter are in the packing machine.

My invention is particularly designed for filling tubes or molds of considerable length and small diameter with treated ground cork which, while in the tubes, is treated to solidify the mass; presently pushed out of the tubes in the form of rods and finally cut into thin disks or washers for use in connection with bottle closures. It is essential for my purposes that the material be packed evenly in the molds and that each mold be packed substantially as are all others and this is accomplished by the devices illustrated.

1 are rods, carrying weights 2 if necessary, which are adapted to play freely and vertically in a frame 3. The lower end of the rods form, or carry, a foot or packer 4, shown in enlarged side elevation and plan in Figs. 4 and 3.

5 are hoppers the lower ends of which are spherical or cylindrical in form which are furnished with an outlet 6 and which carry a shutter or gate 7 which is furnished with a perforation 8, which is made to match with the bottom of the hopper and which is secured thereto by pivots 9. In one posi-

tion the perforations in the hopper and shutter register. In another position the shutter closes the outlet 6 in the hopper.

10 is a foot, carried by a bracket 11 carried by frame 3, which consists of a step 12 which is supported by a spring 13. A rod or stem 14 projects down through spring 13 and out through the foot 10 and is furnished with jam nuts 15 as shown to keep the foot in place. By means of a set screw 16 the foot 10 may be moved vertically upon frame 3 to initially adjust this part of the machine to the length of tubes to be filled.

The mold 17 to be filled is held at its lower end on step 12 and at its upper end by a keeper 18 formed in the shutter 7, the spring 13 causing a close engagement of these parts.

To remove a filled mold from the machine it is only necessary to pull its upper end out of the vertical when the spring 13, lifting the mold upward, moves the shutter 7 outward and the perforation 8 in the shutter which is in register with the opening of the mold, out of register with the outlet 6 in the hopper and brings the rear part 19 of the shutter across the outlet 6 completely closing this latter. The shutter being moved outward as described, and shown by dotted lines in Fig. 2, the mold 17 is lifted off the step 12 and an empty mold is placed on this step and in the keeper 18 in the shutter when a slight push is only necessary to return the shutter to its first position and to vertically dispose the mold which is its position when being filled. Until the mold is completely filled the rod 1 is within it and serves as a lock to prevent a careless or inattentive operator from prematurely removing a tube. The importance of this will be seen when it is understood that the molds must be completely filled prior to subjecting their contents to treatment else the resultant product will be useless.

As soon as a mold is put in place in the machine the foot on the rod 1, which has been prevented from falling by the shutter 7 closing the outlet 6 in the hopper, drops by gravity to the bottom of the mold and, with it more or less ground cork. The rods are lifted up a short distance and dropped by gravity and during this operation cork is constantly passing down between the mold and rod and past the foot 4. The foot 4 is irregular in cross-section, as shown in Figs. 3 and 4 to permit the passage of the mate-

rial past it and in side elevation it has the form of a truncated cone the larger end forming the working face. The extreme diameter of the lower and larger end of the foot 4 is but slightly less than the interior diameter of the mold 17, the grooves in this foot being of ample size to permit the passage through them of the material to be packed when the rod 1 and the foot are lifted. In action the rod 1 and the foot 4, which is rigidly attached to it, are constantly moving rotarily in either one or the other direction and the striking face of the foot, in a number of blows, will operate over the entire upper surface of the material in the mold beneath it hence the material in the mold is evenly packed. If the bottom, or operating, face of the foot 4 be of too small a diameter I have found that the contents of the mold are unevenly packed and the product is, for my purposes, unsatisfactory. As more and more cork passes beneath the foot this foot and the rod 1 rises. When the cork has nearly or quite reached the top of the mold, and the lifting of the rod 1 brings the foot clear of the mold, much more cork enters the latter in a given time than is possible when the tube is partly closed by the rod and foot hence in order that the upper end of the mold be packed as tightly as the lower part it is necessary that the foot strike harder blows at this point. I accomplish this by a spring 20 which is carried by rod 1 and which, when the rod is operating at the upper end of the mold, engages and is compressed by a suitable stop every time that the rod is lifted. A part of the frame 3 makes an acceptable stop for this purpose. The expansion of the spring 20 added to the falling weight of the rod and connected parts I find sufficient to accomplish my purpose.

As the position of the rod 1 is constantly changing the means for lifting and dropping it must adapt itself to these changing positions. I have found a convenient lifter to be simply a bar 21 with a hole 22 therein of somewhat greater diameter than the rod 1 through which the rod passes. If the inner end of bar 21 be lifted the hole 22, acting as a clutch, will pinch the bar 1 and the bar will be locked to the rod. A further lifting of the bar will cause it to lift the rod. As soon as the lifting means are removed from the bar this latter will fall down with the rod until it is arrested by a stop, as 23, carried by frame 3. It will be observed that the rod 1 is lifted an equal distance every time that the bar 21 is lifted, this lifting being entirely independent of the position of its lower end which engages and packs the material in the tube 17. The rod 1 being lifted and dropped equally throughout the operation of filling the tube or mold insures an even packing of the material therein. Every

time that a rod 1 is lifted a quantity of cork will run down past and under the foot, or the foot 4 when lifted will be drawn up through the cork compressing this cork between it and the side of the mold until the foot passes when it will drop from the sides and fall upon the top of the body of cork already operated upon by the foot and be in position to be packed by the foot when it again falls. Every time that the rod is dropped the position of the foot 4 will be higher than it was at the last lifting, this being the case it will be seen that the rod lifting means does not engage the rod 1 twice at the same point during the packing of any one mold, it is for this reason that some device which will engage and lift the rod irrespective of its vertical position must be employed.

The clutch arrangement which I have described answers the requirements perfectly.

The inner ends of the bar 21 may be lifted by any suitable cam but as a number of the filling machines are for the sake of economy and convenience usually arranged in line I find it convenient to equip a shaft 24, which carries fast and loose pulleys 25 which can be driven by a belt in the usual manner, with disks 26 which carry near their peripheries a rod 27 which upon every revolution of the shaft 24 engages, lifts, and drops the bars 21 which lift the rods 1. In Fig. 2 the rod 27 has lifted the bar 21, and the latter the rod 1, to almost its full height. As soon as rod 27 is moved away from bar 21 the latter will fall until arrested by a stop 23 where it will remain until bar 27 again engages and lifts it.

Having thus described my invention I claim as new and desire to secure by Letters Patent:—

1. In a machine for filling a mold with cork, in combination, a mold, a packing foot of a diameter approximating the interior diameter of the mold and the sides of which are serrated to pass the material to be packed upon an upward movement of said foot, a rod carrying said foot, and means for reciprocating and permitting a rotary movement of said rod without removing the packing foot from the mold.

2. In a mold filling machine, in combination, a packer, a means for reciprocating said packer, and means for accelerating the operative movement of said packer when the mold has been filled to a predetermined point.

3. In a mold filling machine, in combination, a hopper, a gate, for opening or closing the lower end of said hopper, furnished with a keeper for the upper end of a mold, a stop for carrying the lower end of the mold, a packer, and means for intermittently lifting and dropping said packer.

4. In a mold filling machine, in combina-

tion, a hopper, a gate, furnished with a keeper for the upper end of a mold, pivoted to said hopper, a spring supported step for carrying the lower end of the mold, a packer, and means for intermittently lifting and dropping said packer.

5. In a mold filling machine, in combination, a multiplicity of mold carrying devices consisting each of a hopper and a spring supported step, a vertical packer passing through each hopper, clutches consisting of perforated bars through which the vertical rod of said packers pass, and rotating means for intermittently lifting said clutches and rods, all substantially as and for the purposes set forth.

6. In a mold filling machine, in combination, a hopper and means operated by the insertion or removal of a mold for opening or closing the discharge end of said hopper. 20

7. In a mold filling machine, in combination, a mold, a hopper communicating with said mold, a packer and means for operating the same, and means, operated by the removal of said mold, for closing the opening 25 in said hopper through which material is fed to said mold.

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