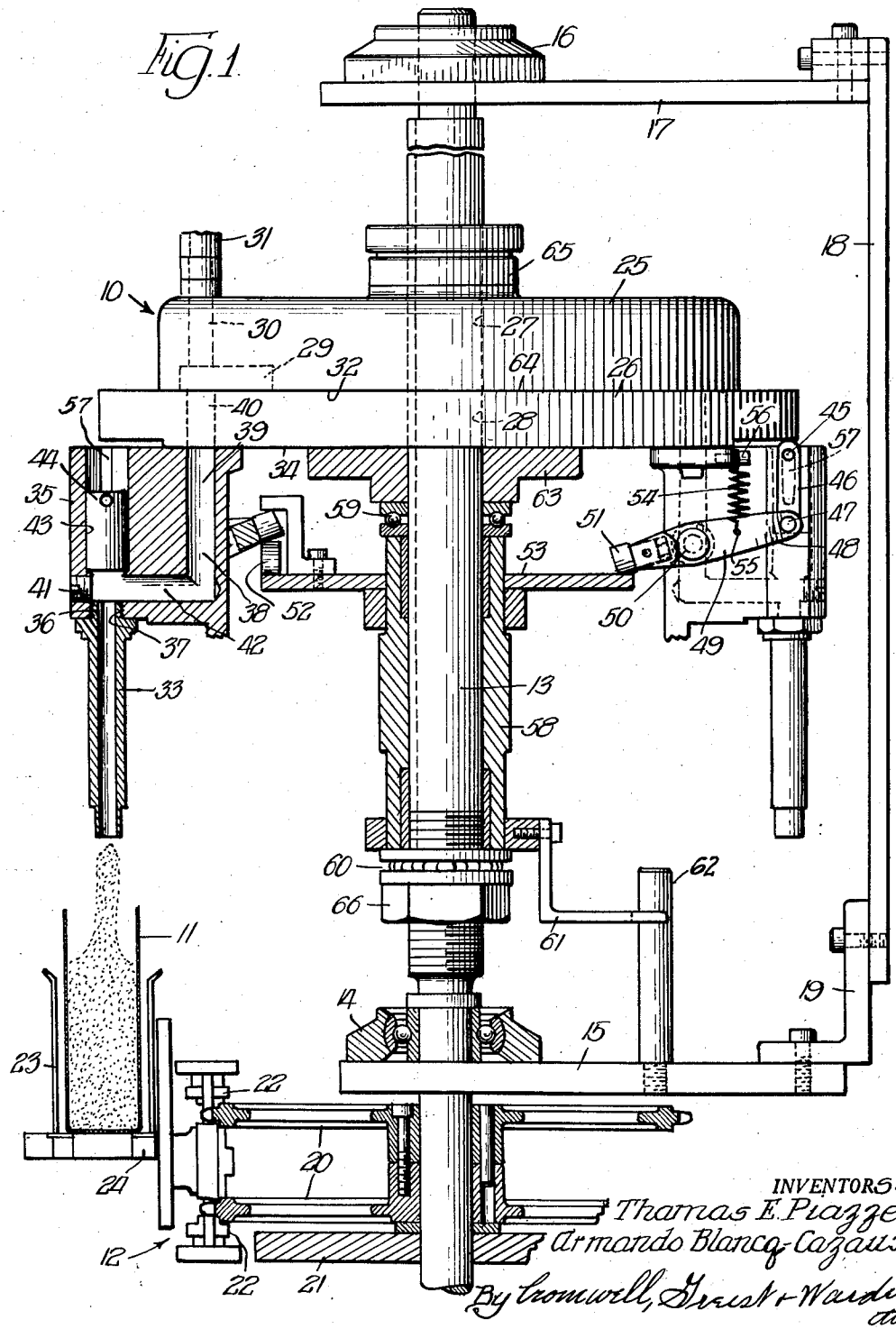
May 26, 1959 T. E. PIAZZE ET AL 2,888,046

RECEPTACLE FILLING MECHANISM

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Fig. 1



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Fig. 2

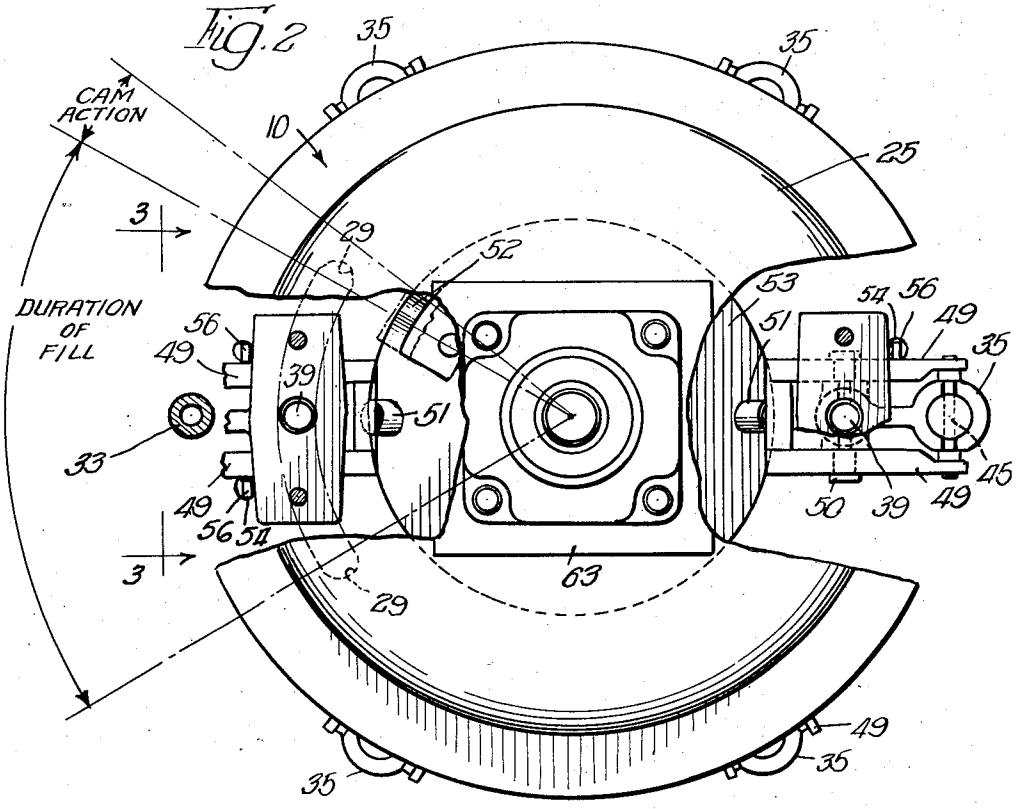
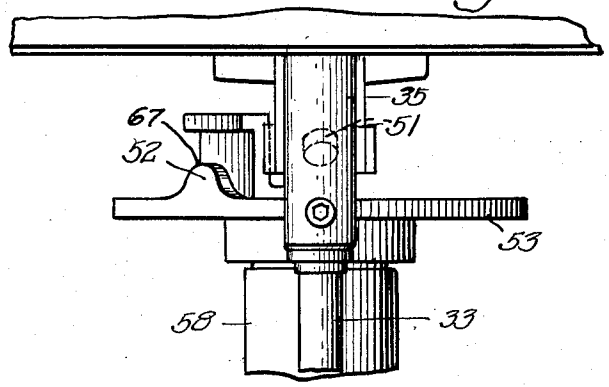


Fig. 3



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RECEPTACLE FILLING MECHANISM

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3 Claims. (Cl. 141—117)

This invention relates to packaging and is more particularly concerned with improvements in a receptacle filling device of the dispenser type which is adapted for use in conjunction with a packaging machine to deliver a measured amount of a semi-fluid product into the mouth of an open bag or similar receptacle.

In the packaging of materials which are in a paste-like or semi-fluid state, various devices have been proposed for dispensing a measured amount or charge of the material into the mouth of an open bag, or like packaging receptacle, which is moved on a conveyor or other carrying means into charge receiving position beneath the device. However, many of these devices have proven unsuccessful because no satisfactory arrangement is provided for cutting off the successive charges cleanly while maintaining uniformity in the amount of material delivered in each charge. The desirability of providing a multiple nozzle device of this type for high speed filling operations in which the nozzles do not have objectionable drip has long been recognized and it is a general object of the present invention to provide an improved filling device which operates to deliver successive uniform charges of a semi-fluid material through filling nozzles having provision for cutting off the stream of material cleanly at the end of the nozzle upon the passage of the required amount of the material for each charge with no variation in the quantity of the material delivered and with no nozzle drip or "tier" after each charge.

It is a more specific object of the invention to provide an improved rotary type filling head for delivering measured amounts of a semi-fluid material into the open mouths of successive bags or similar receptacles which are carried beneath the filling head for a sufficient interval to receive the charges of material from the same.

It is a further object of the invention to provide a rotary filling head in which measured charges of a semi-fluid material are delivered through a series of peripherally spaced filling spouts or nozzles by pressure which is applied to the successive charges so that the material is delivered in a rapid and efficient manner and wherein the pressure is increased at the end of the delivery of each charge to prevent stretching out of the last of the material in each successive charge and wherein suction is applied when the pressure is relieved to draw back into the nozzle the material which remains in the nozzle after separation of each charge therefrom thereby preventing dripping at the nozzle between delivery of successive charges therefrom.

It is another object of the invention to provide a receptacle filling device which comprises a filling head supported for rotation about a vertical axis and having a series of depending nozzles for delivering successive charges of the material, which nozzles are circumferentially spaced and provided with cam controlled pistons or plungers, arranged in passageways in the nozzles, for forcing each successive charge from its nozzle, and for thereafter withdrawing at a speed sufficient to create

a suction in the nozzle which exerts a pull on any material remaining in the nozzle, sufficient to prevent the dripping of the material therefrom between the delivery of the successive charges thereof.

These and other objects and advantages of the invention will be apparent from a consideration of the filling device which is shown by way of illustration in the accompanying drawings wherein:

Fig. 1 is a side elevation, with portions thereof in vertical section, of a rotary filling device having incorporated therein the principles of the invention, the device being shown in association with a receptacle carrying chain conveyor which is mounted on supporting sprockets and moves in a horizontal path;

Fig. 2 is a plan view of the apparatus with portions thereof broken away; and

Fig. 3 is a fragmentary side elevation, the view being taken on line 3—3 of Fig. 2.

Referring to the drawings, there is illustrated a rotary filling head **10** having incorporated therein the principal features of the invention, which is employed with a bag filling and closing machine for dispensing measured quantities or charges of a semi-fluid material into successive open topped bags **11**, the latter being carried in a circular path beneath the head **10** by a bag supporting and conveying mechanism **12**.

The filling head **10** is mounted on a vertically disposed rotatable shaft **13** which forms the main drive shaft for the machine. The shaft **13** is carried at its lower end in a bearing **14** mounted on a horizontally disposed support plate **15** and at its upper end in a bearing **16** mounted on an overhanging arm or leg **17** of an inverted L-shaped bracket formation **18** which extends upwardly from the support plate **15** and is attached thereto by an angle member **19**.

The drive shaft **13** has a pair of sprocket members **20** secured on the lower end thereof between the shaft support plate and a horizontal frame plate **21** spaced below the same, on which the chains **22** of the conveyor **12** are carried. Upwardly opening pocket forming holdings or cups **23** are secured on the chains **22** by means of spaced bracket forming members **24**. The cups **23** receive the bags **11** and carry the same in a circular path around the sprockets **20** and beneath the filling head **11**.

The filling head **10** comprises relatively fixed and movable circular sections or members **25** and **26**. The fixed head section or member **25** of the device has a central aperture or bore **27** for receiving in rotatable relation therein the vertical drive shaft **13** while the movable head section or member has a similar central bore **28** for receiving in keyed or fixed relation the shaft **13** so that this section rotates with the shaft **13**.

The fixed head section **25** is held against rotation by securing the same to a fixed portion of the frame of the machine or to any other convenient fixed support member (not shown). It is provided with an internal material receiving chamber or passageway **29** which may be arcuate in shape and which is connected by a vertical inlet passageway **30** to a feed pipe **31** or other source of material supply which delivers the material to the chamber **29** under constant pressure. The chamber **29** opens on the lower face **32** of the fixed head section **25** and serves as a port to deliver the material to the movable head section **26**.

The movable head section **26** carries a series of peripherally spaced nozzles **33** which are mounted in depending relation below the lower face **34** thereof, on block-like support members **35**, the latter being secured in downwardly extending relation on the lower face **34** of the head section **26**. Each of the nozzles **33** comprises

an elongate tubular section having a threaded shoulder 36 at the upper end which is screwed into a threaded aperture 37 in the bottom of the support member 35. The aperture 37 communicates with the lower and outer end of an L-shaped passageway 38 through which the material is delivered to the nozzle 33. The passageway 38 has its vertical leg 39 communicating with a port forming vertical passageway 40 extending through the head member 26 and spaced in a radial direction relative to the axis of rotation to register with the chamber or port 29 in the fixed head member 25 when the head member 26 is rotated to predetermined position. A clean out plug 41 is arranged in the outer end of the horizontal leg 42 of the passageway 38 adjacent the aperture 37.

The support block 35 is provided with a second or auxiliary passageway or bore 43 which extends vertically and generally parallel with the vertical leg 39 of the material receiving passageway 38 and which is open at both ends with the bottom end communicating with the end portion of the horizontal leg 42 of passageway 38 immediately opposite the nozzle receiving aperture 37. A piston member 44 is arranged in slidable relation in the bore 43 and is connected by a cross pin 45 to a pair of links 46 which are in turn pivotally connected at 47 to the outer ends of the legs 48 of a U-shaped operating arm or member 49 which straddles the support block 35 and is pivoted thereon at 50.

The inner end of the member 49 extends toward the shaft 13 and carries a cam roller 51 which is positioned to engage with a cam 52, mounted on a fixed circular support plate 53. A tension spring 54 is connected at 55 to the outer end of each leg 48 of the arm member 49 and at 56 to the support block 35 which urges the arm member 49 in a counter-clockwise direction raising the piston 44 to the cocked position. The block 35 is slotted at 57 to permit vertical movement of the cross pin 45.

The supporting plate 53 for the cam 52 is mounted on the upper end of a tubular section forming a sleeve member 58 which is mounted on the shaft 13 between upper and lower bearing members 59 and 60. The shaft 13 is rotatable in the bore of the sleeve member 58 and the latter is held in non-rotatable relation on the shaft 13 by means of the angle bracket 61 secured to the lower end of the sleeve member at its one end and having its other end engaging with an upstanding post 62 on the base plate 15. The bearings 59 and 60 are positioned in axially spaced relation on the vertical shaft 13 and bear against opposite ends of the sleeve member 58. The movable head member 26 is supported in spaced relation above the upper bearing 59 by means of a hub-like spacer 63. The fixed head member 25 rides on the upper face 64 of the movable head member 26 and is held against upward movement by a suitable collar 65. The lower bearing 60 is held in position on the shaft 13 by a threaded sleeve nut or collar 66 which is secured on a threaded portion of the shaft.

The cam 52 has an arm operating portion or rise 67 which is positioned to lower the piston 44 rapidly at the end of the feeding interval to discharge the last portion of the charge from the nozzle 33 and immediately thereafter raise the piston with sufficient speed to create suction in the nozzle and draw back any material remaining in the nozzle which would otherwise continue to flow downwardly and drip from the same.

In operation the bags 11 are carried in a circular path around the vertical support shaft 13 by the conveyor 12 with each successive bag carrying cup 23 being aligned vertically with a nozzle 33 on the rotating head member 26. When the head member 26 moves to a point where the passageway or port 40 registers with the one end of the chamber or port 29 in the fixed head member 25, the material which is supplied to the passageway 30 under constant pressure will flow through the passageways 30, 29, 40 and 38 and through the nozzle 33 for discharge into the open mouth of the bag 11, the latter being spread or opened, if desired, by a suitable top opening or spreading device (not shown). The flow of the material will continue until the port 40 passes the end of the chamber 29, as indicated in Fig. 2. The cam 52 is positioned to reciprocate the piston 44 so that it moves downwardly with a rapid motion as the pressure is relieved in the pasageway 38 and the flow of material stops. The pressure created by the rapid movement of the piston 44 acts to force the last of the charge from the nozzle 33 and cut off the end of the charge cleanly. The rapid return movement of the piston 44 acts to create a suction in the nozzle 33 and to withdraw into the nozzle any material which remains therein so that it does not tend to drip from the nozzle as the head member 26 continues to revolve and brings the nozzle into alignment or register above the next bag 11 which is moved into charge receiving position by the conveyor 12.

While particular details of construction have been referred to in describing the form of the device illustrated it will be understood that other details of construction are contemplated within the scope of the invention. Also, the invention is not limited to use in a bag filling machine but may be employed in connection with the dispensing of measured charges of material of this type into receptacles of any kind.

We claim:

1. A mechanism for dispensing successive measured quantities of a flowable material comprising a head having an upper hollow stationary portion adapted to receive a supply of the material for discharge through a downwardly opening port, said head having a lower rotatable portion mounted on a vertical axis and carrying depending hollow discharge nozzles spaced around the periphery thereof, each of said nozzles connecting with a charge receiving passageway in said rotatable head portion which opens upwardly and which is movable into register with the discharge port in the stationary head portion, a vertical auxiliary passageway in said rotatable head portion connecting with the upper end of each of said nozzles and with the lower end of its charge receiving passageway, a plunger in said auxiliary passageway, a U-shaped bracket pivoted intermediate its ends on said nozzle and connected at one end with said plunger and a cam track fixed adjacent the axis of rotation of said rotatable head portion for engaging the other end of said bracket to reciprocate the plunger, said plunger moving downwardly to force a charge of the material out of the nozzle and thereafter moving upwardly to apply suction to the nozzle to prevent any material remaining in the nozzle from dripping.

2. A dispensing device for a paste-like material comprising a stationary head having a passageway for receiving a supply of the material and a downwardly opening discharge port, a rotatable head mounted beneath said stationary head on a vertical axis and having a series of peripherally spaced depending discharge nozzles, each of said nozzles comprising an elongate tube connected to the lower end of an L-shaped charge receiving passageway which terminates at an upwardly opening port in said rotatable head, said port being movable into register with the discharge port in the stationary head, a vertical auxiliary passageway having its lower end connecting with the lower end of the charge receiving passageway, a plunger in said auxiliary passageway, means to reciprocate the plunger in timed relation to the movement of the head, said plunger being moved downwardly to force a charge of the material out of the lower end of the nozzle and thereafter, said plunger being moved upwardly to apply suction to the passageway in the nozzle so as to prevent any material remaining in the nozzle from dripping.

3. A device for dispensing successive measured quantities of a semi-fluid material comprising a stationary head having a passageway for receiving a supply of the

material and a discharge port in the lower face thereof, a rotatable head mounted below the stationary head on a vertical axis and having a series of depending discharge nozzles spaced around the periphery thereof, each of said nozzles having an L-shaped charge receiving passageway terminating at the upper end of its vertical leg in an upwardly opening port which is movable upon movement of said rotatable head into register with the discharge port in the stationary head, an auxiliary passageway extending vertically in each of said nozzles having a connection at its lower end with the end of the horizontal leg of the charge receiving passageway, a vertical filling tube forming the discharge end of said nozzle, a plunger in said auxiliary passageway, an arm pivotally mounted on said nozzle intermediate its ends, said arm having one end connected with said plunger and a cam

track for engaging the other end of said arm to reciprocate the plunger at predetermined intervals and at a relatively rapid rate, whereby the downward movement of the plunger forces a charge of the material out of the nozzle and thereafter the upward movement of the plunger applies suction to the passageway in the nozzle to suck any material remaining at the lower end of the filling tube into the tube so as to prevent it from dripping.

References Cited in the file of this patent

UNITED STATES PATENTS

989,546	Jensen	Apr. 11, 1911
1,947,535	Schmidt	Feb. 20, 1934
2,721,008	Morgan	Oct. 18, 1955