

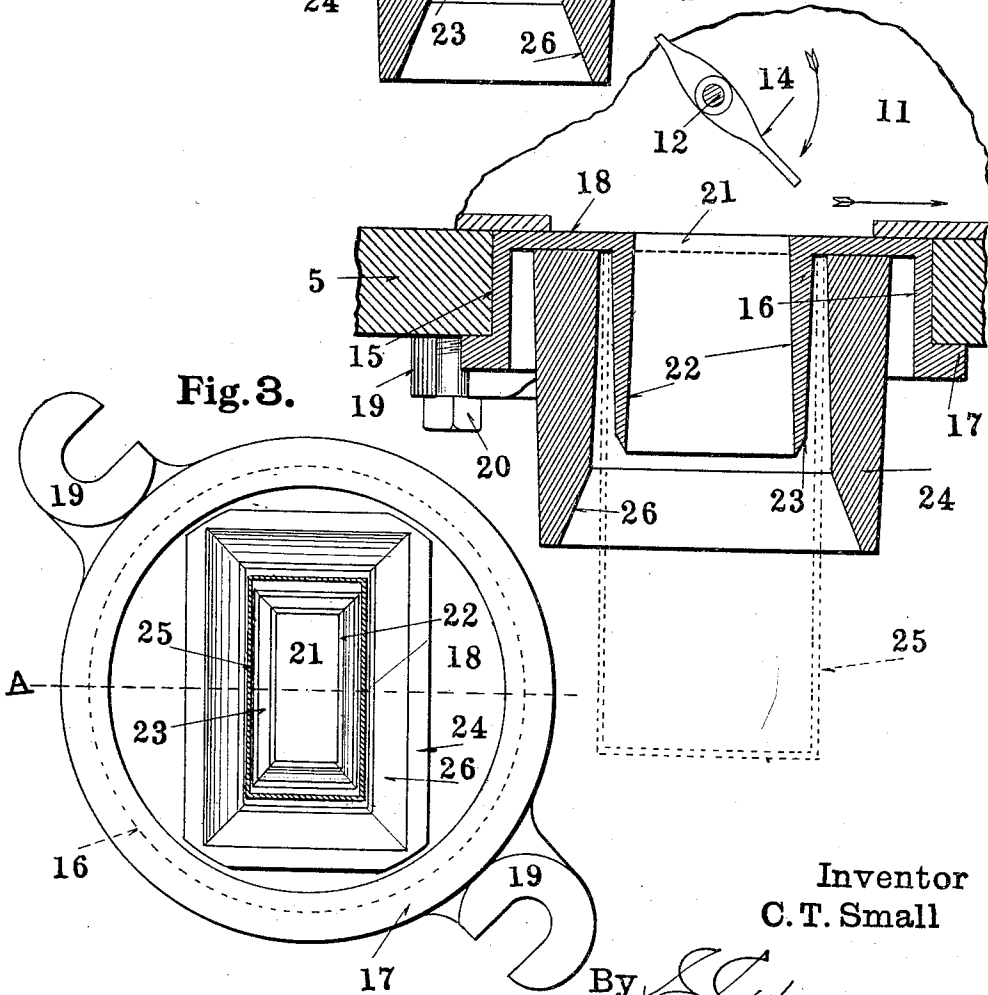
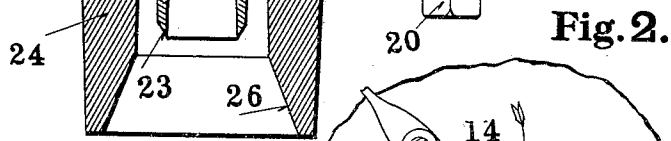
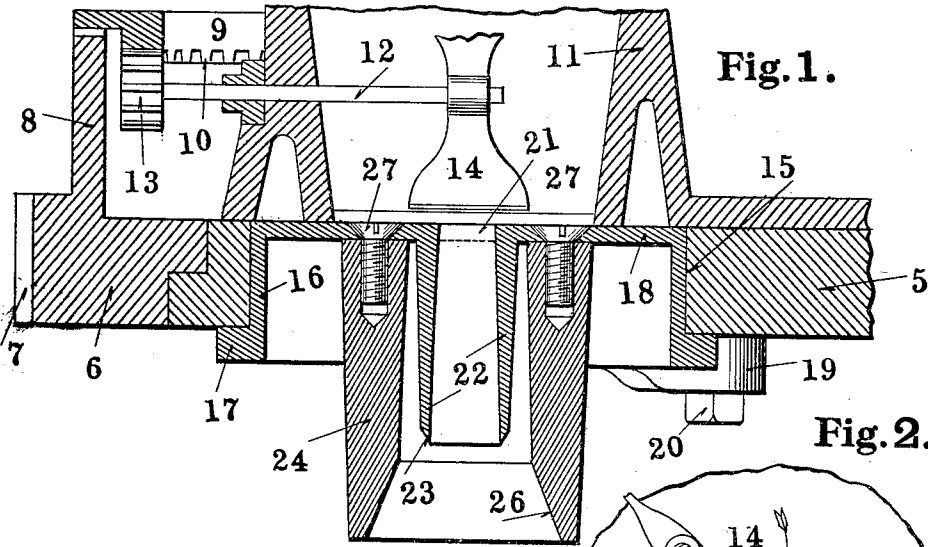
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C. T. SMALL

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FILLING MACHINE

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Att'y.

UNITED STATES PATENT OFFICE

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FILLING MACHINE

Application filed January 3, 1928. Serial No. 244,219.

My invention relates to improvement in filling machines and particularly to the general type of machines shown and described in my application Serial No. 88,765, filed February 17, 1926.

The object of my invention is to adapt such machines for filling paper bags or cardboard cartons. To this end my invention consists in a novel form of nozzle and to the manner of cooperation between said nozzle and the packing agitator in the hopper supplying material to the nozzle.

In the accompanying drawings, which illustrate so much of a filling machine as is necessary to set forth my invention, Figure 1 is a vertical radial section through the outer part of the nozzle carrying disk and adjacent parts; Figure 2 is a section taken at right angles to Figure 1; and Figure 3 is a bottom plan view of the detached nozzle, the bag or carton being shown in section.

The filling machine which as shown is similar to that described in my above mentioned application, comprises a nozzle carrying disk 5 to which is secured a rim 6 provided with teeth 7 by means of which it is driven, and with an upwardly projecting flange 8. Secured to the upper edge of the flange 8 is a crown wheel 9 having teeth 10 to drive the packing agitators. Bearing on the upper face of the disk is a hopper 11 containing the material with which the bag or carton is to be filled. Journaled in the outer wall of the hopper are one or more shafts 12, one only of which is shown. On the outer end of this shaft is a pinion 13 meshing with the crown wheel 9 and on the inner end a packing agitator 14.

Formed in the disk 5 so as to pass directly under the hopper as the disk is rotated, are openings 15 to receive the nozzles. As shown in my prior application above referred to the openings are ten in number but the number may of course be varied. Each nozzle comprises a body portion 16 fitting snugly into the opening 15, a flange 17 bearing against the lower face of the disk, and a top plate 18 flush with the upper face of the disk. Carried on the flange 17 are a pair of slotted lugs 19 engaging with bolts 20 by means of

which the nozzles are secured in position. This construction provides for the quick and easy insertion and removal of the nozzles by loosening the screws and slightly rotating the nozzles. Formed in the top plate is an opening 21 corresponding in shape to but somewhat smaller than the open end of the bag or carton to be filled. In the form of nozzle shown this is an elongated rectangle. When this or any other elongated form of opening is used its major axis is arranged at right angles to a radial line extending to the center of the machine (indicated by the dotted line "A" in Figure 3). Surrounding the opening 21 is a correspondingly shaped flange 22 the inner faces of the walls of which are flush with the boundary lines of the opening. The walls of the flange 22 are slightly tapered both externally and internally and the lower end is provided with an abrupt taper or bevel 23. Enclosing the flange 22 is a sleeve 24 of corresponding shape having its inner faces slightly tapered in the opposite direction from the adjacent faces of the flange so that the space between the sleeve and flange will be widest at the bottom. This space receives and shapes the open end of the bag or carton 25, shown in dotted lines in Figure 2. The sleeve 24 extends below the flange 22 and is provided with a bevel 26 for guiding the bag or carton into the space between it and the flange. While the sleeve may be integral with the plate 18, for convenience in manufacture I have shown it as formed separately and secured in position by screws 27.

In operation the bag or carton 25 is raised into position, as shown in dotted lines in Figure 2, in the manner described in my prior application. The form of the nozzle is such that it not only properly positions the bag or carton but also shapes the open end of the same which is likely to become more or less distorted owing to the pliable nature of the material of which it is formed. Filling is accomplished in the same manner as described in my above mentioned application except that the compression packing therein described cannot be employed as it would rupture the comparatively fragile paper or cardboard container. As compression

sion packing of the kind above referred to cannot be used, other means must be provided to insure the complete and uniform filling of the containers. This I accomplish by so timing the rotation of the agitator 14 with respect to the travel of the nozzle that each time a nozzle passes under an agitator the agitator will travel downwardly in a direction against the travel of the nozzle so that the agitator also acts as a packing device forcing the material into the opening 21. I find in practice that this secures not only uniformity in the contents of the containers filled, but also insures that the maximum amount of material consistent with the fragile nature of the container is supplied thereto. I secure the proper timing of the agitators by providing the crown wheel 9 with teeth 10 equal in number to the product of the number of teeth in one of the pinions 13 and the number of nozzles in the machine. For example, in a machine having ten nozzles the pinion may have ten teeth and the crown wheel 9 one hundred teeth.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, the combination with a hopper, of a table movable under said hopper, a nozzle carried by said table, said nozzle having a flange adapted to enter the container to be filled, a sleeve surrounding said flange and projecting below the same, said flange and sleeve cooperating to form a tapered space to position and shape the receptacle to be filled, and a bevel on the part of the sleeve projecting below the flange to guide the container into the space, said flange providing a feed passage for delivering material from the hopper to the container.

2. In a device of the class described, the combination with a hopper, of a table movable under said hopper, and a filling nozzle carried by said table; said nozzle comprising a spout projecting below the table and conforming to the shape of the bag to be filled, and a sleeve enclosing said spout and separated only a slight distance therefrom, said sleeve projecting below the spout and provided at its lower end with a bevel for guiding the bag into the space between the spout and sleeve.

3. In a device of the class described, the combination with a hopper, of a table movable under said hopper, a nozzle carried by said table, said nozzle having a flange adapted to enter the container to be filled, a sleeve surrounding said flange and projecting below the same, said flange and sleeve cooperating to form a tapered space to position and shape the receptacle to be filled, a bevel at the lower end of said flange at one side of said space, and a reverse bevel at the other side of said space and formed on the part of

the sleeve projecting below the flange, said flange providing a feed passage for delivering material from the hopper to the container.

4. In a device of the class described, the combination of a hopper, a disk rotating under said hopper and provided with uniformly spaced discharge openings for the delivery of material from said hopper to containers, a rotary agitator in said hopper provided with a blade whose path of travel lies entirely above the disk and whose width is not less than the width of said discharge openings in the direction transverse to their path of movement, and means for rotating said agitator in such direction that the blade, when in the portion of its path nearest the disk, has a direction of movement opposed to that of the disk, said rotating means being so timed that said blade is moving downwardly toward each discharge opening in the disk as said discharge opening passes under the agitator and that the successive relative positions of blade and discharge opening are the same as to all of said openings.

In testimony whereof, I hereunto affix my signature, this 29th day of December, 1927.

CHESLEY T. SMALL.