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[54] **IMPROVED OUTLET CLOSURE IN A PACKAGING MACHINE**

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[51] **Int. Cl.** **B65d 47/06,** B65b 9/10

[58] **Field of Search** 53/178, 180, 182; 141/224, 141/256, 264; 222/501, 509, 559, 560, 527–529; 137/528; 251/318, 319, 326

[56] **References Cited**

UNITED STATES PATENTS

1,806,936	5/1931	Finnell	222/560 X
3,318,067	5/1967	Grafingholt	53/180 X
3,363,605	1/1968	Deckert	222/560 X
3,645,497	2/1972	Nyboer	251/326 X

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[57] **ABSTRACT**

There is disclosed part of a packaging machine for making, filling and sealing webs of tubular packaging material. The machine includes a mandrel and a metering worm. A flexible closure slide movably disposed in the mandrel controls the flow of material through the mandrel.

7 Claims, 2 Drawing Figures

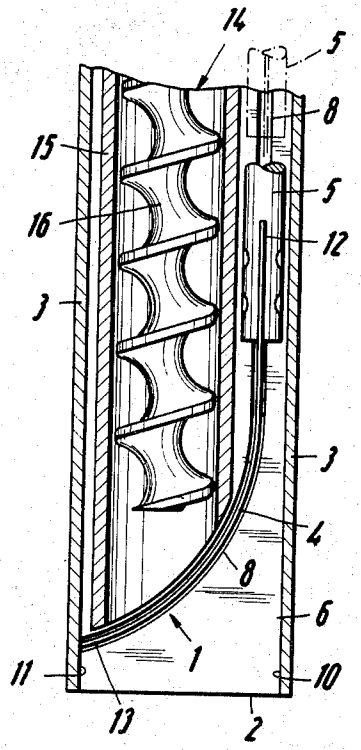


Fig. 1

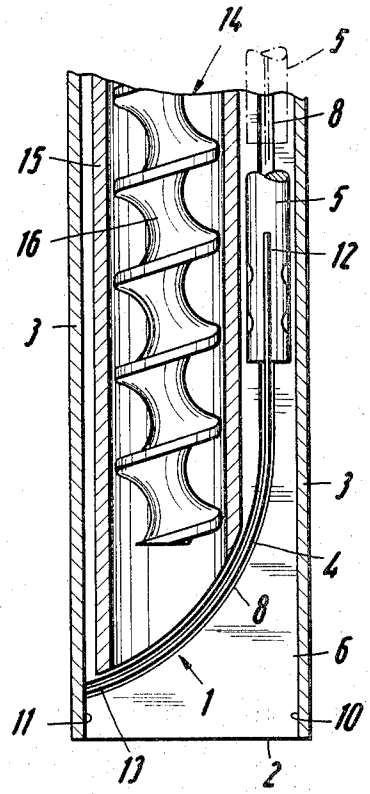
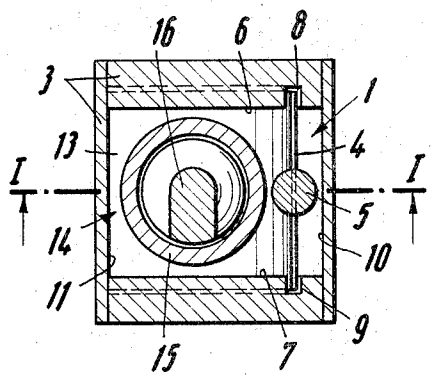


Fig. 2



IMPROVED OUTLET CLOSURE IN A PACKAGING MACHINE

The invention relates generally to packaging machines, specifically to so-called "tubular bag machines," of the type for forming, filling and sealing tubular packaging material with transverse seams, and particularly to a movable closure mechanism for controlling the flow of material through the forming mandrel of such machines.

A desirable feature of such packaging machines is a positive, leak-proof closure at the discharge end of the forming or filler mandrel to prevent a continuing trickle of the filler material after the interval provided for filling. When a positive closure is not made, some of the filler material becomes welded into the transverse seams as these are formed. Seams containing filler material not only fail to seal properly but also lack the strength developed in clean, well made seams.

In the prior art, a closure mechanism is already known in which a closure flap is pivoted about a horizontal axis and fitted to the discharge end of a forming mandrel. The flap is actuated by a linkage means located within the forming mandrel. A closure mechanism of this type must be relatively large to ensure reliable operation and to be wear resistant. This type of closure mechanism is suitable for use only with forming mandrels having correspondingly large cross section.

It is also known to provide a metering device arranged within a hollow forming mandrel, in which a metering worm is rotatably disposed within a tube and a cone-like structure is adapted to be pressed against the outlet end of the tube to affect closure. A disadvantage of this device is that the material delivered by the metering worm is sharply deflected by the cone upon leaving the tube and it then impinges on the interior of the forming mandrel. The flow of the material is impeded which reduces the output of the machine. Again, this closure mechanism must be relatively large if it is to operate reliably.

Another metering device used for filling viscous products such as syrups or the like is described in U.S. Pat. No. 1,479,021. The closure mechanism used in this device has two slides mounted in grooves which are movable in relation to each other along inclined paths. The opposing ends of the slides are formed as knife edges and are effective to close off the flow of material when brought together. Actuation of the slides is effected by a mechanical linkage means arranged parallel with the outward flow of the filler material. The use of such a closure device on a "tubular bag machine" would also require a considerable minimal structural size and only a small portion of the cross section of the forming mandrel could be used to discharge the filler material.

Accordingly, it is the primary object of this invention to provide a packaging machine for making, filling and sealing tubular bags having a compact closure device which is reliably operable with forming mandrels of relatively small cross section.

An aspect of the present invention resides in the provision of an apparatus which forms part of a packaging machine used for forming, filling and sealing tubular packaging material. More particularly, the apparatus includes a hollow mandrel for receiving packaging and filler material and is provided with two parallel spaced internal guides extending in a curved direction and a controllable closure mechanism effective to prevent, selectively, flow of filler material out of said mandrel. The mechanism includes a movable closure slide of flexible material displaceably mounted within the mandrel in or between the guides to permit orientation of the slide, in response to movement thereof, either in a position parallel to the material flow direction or a position substantially transverse to the flow path. The field of curvature established by the slide in closing position is inverse or in opposite direction to the end opening of the mandrel.

The closure device according to the present invention does not require costly or cumbersome bearing pins which can be prematurely worn by the entry of filler material. Since the stiffness of the closure slide is determined by the type and thickness of the material of which it is made, the guide may be curved sharply. Thus, the closure device may be incorporated without difficulty into forming mandrels of small cross section.

For a better understanding of the present invention, together with other and further objects thereof, reference is had to the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

In the drawings:

FIG. **1** is a longitudinal cross sectional view, of the outlet end of a packaging machine, taken along line I—I of FIG. **2**; and

FIG. **2** is a cross sectional view of the outlet end showing the metering tube and forming mandrel.

Referring now to the drawings, there is shown part of a packaging machine for making, filling and sealing tubular bags. The machine includes a material flow metering device **14** and a closure member **1** for controlling the opening of the metering device. The closure member **1** is arranged within a hollow tube of rectangular cross section forming a mandrel **3** and adjacent to an outlet end **2.** The closure member **1** is comprised of a flexible metallic or plastic slide **4,** such as a metal strip, mounted for sliding movement in two parallel guide grooves **8, 9** formed into opposing inner surfaces **6, 7** of the mandrel **3.** The metering device **14** is enclosed by mandrel **3** and comprises a metering worm **16** mounted for rotation in structural means comprising a metering tube **15.** The grooves **8, 9** are arranged to guide the slide **4** from an open position essentially parallel and adjacent to an inner surface **10** of the mandrel **3** in a curved path across the output end of the tube **15** to a closed position with a lower end **13** of the slide bearing against an inner surface **11** of the mandrel **3.** The slide **4** has attached to its upper end **12** an actuating linkage **5** connected to a drive mechanism, not shown.

In operation, the slide **4** is moved in the grooves **8, 9** by the actuating linkage **5** to a closed position with the lower end **13** of the slide **4** pressing against the inner surface **11** of the mandrel **3** thus closing off the metering tube **15** and preventing flow of filler material. When the slide **4** is pulled away from the inner surface **11,** the metering tube **15** is opened and the filler material, not shown, is metered out by the rotating worm **16.**

The slide **4,** according to the invention, may also be used without a metering device arranged in mandrel **3.**

The guide grooves **8, 9** may also be provided by securing in the mandrel **3** two pairs of guides plates, not

shown, having at least partly curved guide edges at a predetermined distance from each other. Friction between the slide **4** and the grooves **8, 9** may be minimized by pre-bending the slide **4,** over at least part of its length, to match the curvature of the grooves **8, 9.**

While there have been described what are at present considered to be the preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is aimed, therefore, in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a packaging machine for forming, filling and sealing of tubular packaging material, an improved mechanism for controlling flow of material during a filling operation comprising

a hollow mandrel for receiving packaging and filler material and provided with two parallel spaced internal guides extending in a curved direction with the field of curvature being inverse to the end opening of the mandrel;

a controllable closure mechanism effective to prevent, selectively, flow of filler material out of said mandrel, said mechanism comprising a movable closure slide of flexible material displaceably mounted within said mandrel abutting said guides to permit orientation of the slide, in response to movement thereof, either in a position parallel to the material flow direction or a position substantially transverse to the flow path;

structural means within said mandrel cooperating with said slide for selectively controlling the flow of material out of said mandrel; and

means for actuating said closure slide.

2. A packaging machine for forming, filling and sealing of tubular packaging material according to claim **1,** wherein said guides are grooves within the wall of said mandrel.

3. A packaging machine for forming, filling and sealing of tubular packaging material according to claim **1,** wherein said closure slide is in the form of a metal strip.

4. A packaging machine for forming, filling and sealing of tubular packaging material according to claim **1,** wherein said closure slide has a pre-set curvature over at least a portion of the length thereof matching the curvature of the guide grooves.

5. A packaging machine for forming, filling and sealing of tubular packaging material according to claim **1,** wherein said guide grooves are formed as an integral part of the inner surfaces of said mandrel.

6. A packaging machine for forming, filling and sealing of tubular packaging material according to claim **1,** wherein said structural means include a metering tube within said mandrel having a terminal end adjacent to said guides whose curvature is substantially parallel with or complementary to said slide when the latter is in the transverse position; said closure mechanism being arranged directly adjacent to said terminal end of said metering tube.

7. A packaging machine for forming, filling and sealing of tubular packaging material according to claim **6,** wherein said metering tube includes a metering worm.

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