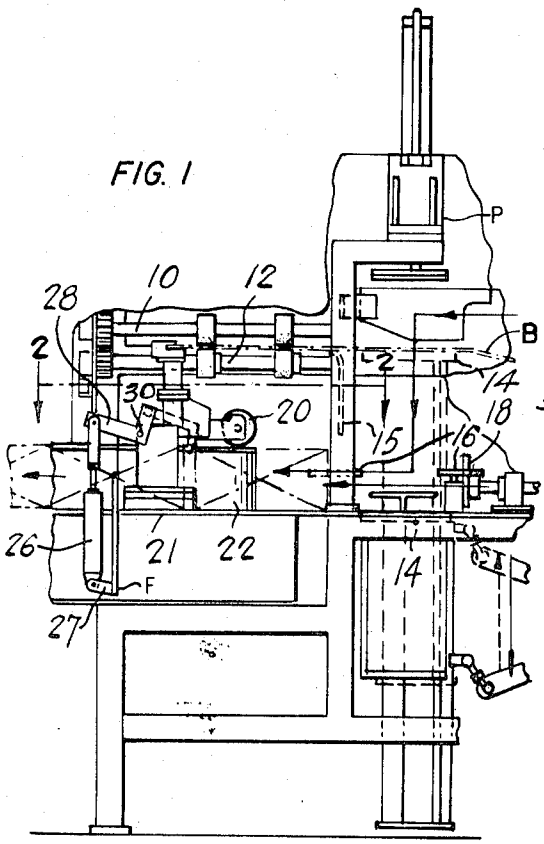
Dec. 29, 1970 W. HOFFMANN ET AL 3,550,346

METHOD OF SEALING THE MANUFACTURER'S FLAP TO A PACKAGE

Filed April 19, 1968

FIG. 1



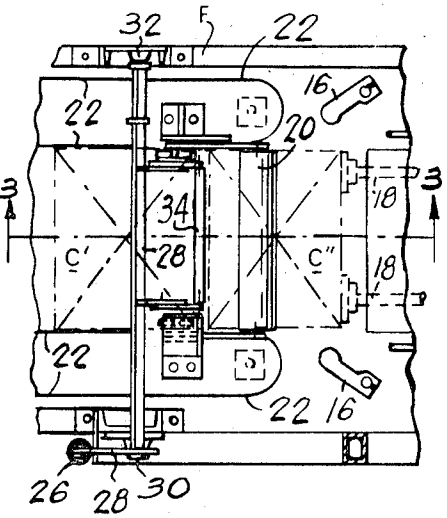


FIG. 2

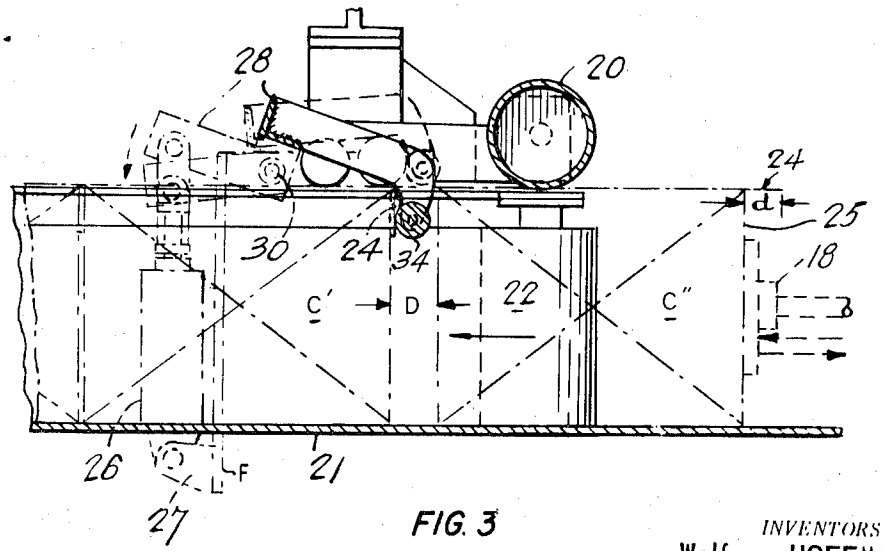


FIG. 3

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METHOD OF SEALING THE MANUFACTURER'S FLAP TO A PACKAGE

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Int. Cl. B65b 11/10
U.S. Cl. 53—32 4 Claims

ABSTRACT OF THE DISCLOSURE

A method of closing and sealing the manufacturer's flap of a partially wrapped commodity by employing leading and trailing aligned packages. The manufacturer's flap of the leading commodity is subjected to downward pressure, and the pressure removed when the trailing commodity is close enough to prevent the flap from fully opening up, followed by bringing the leading and trailing commodities into juxtaposition whereby the juxtaposed manufacturer's flap may be sealed.

This invention relates to a method of sealing a wrapper about a commodity.

More particularly, this invention relates to a method of closing and sealing a wrapper about a commodity where the wrapper is of the type which forms a sleeve about the commodity.

There are various methods known in the packaging art for closing and sealing the free ends of a sheet wrapper, such as kraft paper or corrugated board, about a commodity to be wrapped. One of the more common methods includes forming a sleeve about the commodity with the wrapper by suitable wrapping operations, and to close the sleeve, subsequently folding and juxtaposing one of the free ends of the sleeve against the other free end. The one free end of the sleeve which is juxtaposed to the other ends is normally called a manufacturer's flap, and this may be located at various points on the resulting wrapped package, i.e., the top or bottom surfaces, or either of the side faces about which the sleeve extends. Such methods also normally include assembly line production of wrapping commodities where the commodities are subjected to sequential steps of wrapping at various given stations or zones in the assembly line.

Typical of the prior art methods are those illustrated in U.S. Pats. 2,854,799 and 2,904,941, where the manufacturer's flap of each partially wrapped commodity is closed by subjecting the flap to the action of a mechanical component to close and hold the manufacturer's flap in juxtaposition with the flap to which it is to be secured.

After the above step is accomplished, it is necessary to retain the pressure on the flap for a sufficient period of time to permit the securing agent (e.g., adhesive) to set and hold the sleeve together.

With the advanced speed of production of producing packages, it is necessary to perform this operation as quickly as possible to maintain a high speed of overall production. To this end, applicants have developed an improved method of closing and sealing a manufacturer's flap to form a sleeve about a commodity, which method expedites this portion of the wrapping operation for commodities and is carried out in a simple manner.

Thus, according to this invention, there is provided a method of closing and sealing the manufacturer's flap of a sleeve-like wrapper about a commodity, to form a sealed sleeve, by the steps of providing at least two partially wrapped commodities in which a wrapper forms an enclosed sleeve about each commodity, with one free

end of the sleeve constituting a manufacturer's flap adapted to be secured to the other free end of the sleeve, subjecting the manufacturer's flap of a first commodity to a downward pressure to cause said manufacturer's flap to be placed in juxtaposition with the said other free end of said sleeve, retaining said manufacturer's flap in said position while advancing a second partially wrapped commodity into alignment and relative position with said first commodity whereby the two commodities are spaced apart a distance less than the width of the manufacturer's flap, removing said pressure from said manufacturer's flap and advancing said second commodity into juxtaposition with said first commodity whereby said second commodity retains said manufacturer's flap in a closed position until said flap is firmly secured to form a closed sleeve about said first commodity.

According to a preferred embodiment, the above method is carried out on a continuous in-line manner and sequence whereby after advancing a secured or subsequent commodity into juxtaposition with the first commodity, the method is sequentially repeated.

As mentioned above, the method of this invention is particularly applicable to in-line assembly of wrapped commodities. To this end, according to a further embodiment, a plurality of partially wrapped commodities arriving from a prior wrapping operation, whereby the wrapper forms an unclosed sleeve about the commodities, may be aligned in spaced apart front-to-back manner, and the manufacturer's flap of the leading commodity subjected to downward pressure while advancing the leading commodity at a predetermined speed, subsequently advancing the trailing or following commodity into relative position with the leading commodity whereby said trailing commodity is spaced apart a distance less than the width of the manufacturer's flap of the leading commodity, and after removing the downward pressure from the manufacturer's flap of the first commodity, advancing the trailing commodity at a faster rate of speed than the speed of advancement of the first commodity to cause the second commodity to abut the juxtaposed manufacturer's flap of the first commodity, and subsequently causing slowing the advancement of said trailing commodity to said predetermined speed and repeating the steps for subsequent partially wrapped commodities.

Depending on several factors, it is desirable to place the leading commodity under positive pressure against movement while it is advancing at the predetermined rate of speed, whereby when the trailing commodity abuts the manufacturer's flap, the leading commodity is not dislodged from being maintained in contact with the trailing commodity.

In the above manner, the method of this invention can be applied to various known packaging assembly line production methods whereby applicant's method is performed as a sequential operation of a continuous packaging operation. Consequently, the method of this invention will improve the overall speed of such packaging operations, in addition to simplifying more complicated prior art steps, and resulting in the eliminaton of complicated equipment necessary to carry out the prior art methods.

The method of the present invention is applicable to formation of a closed sleeve about a commodity where the manufacturer's flap can occur on any of the sides of the commodity where it is desired to have the manufacturer's flap. Thus, for example, if the manufacturer's flap is to be located on one of the sides (as opposed to top or bottom) of the commodity, the applicant's method may be carried out in a horizontal plane whereby a trailing commodity is horizontally advanced into juxtaposition with the manufacturer's flap located on the side of the

leading commodity. Alternately, if it is desired to close the wrapper sleeve where the manufacturer's flap is to be located on the top or bottom surface of the commodity, applicant's method will be carried out desirably in a substantially vertical plane whereby the trailing commodity will be lowered or raised into juxtaposition with the leading commodity. However, it will be understood by those skilled in this art that applicant's method can also be carried out on any plane between the horizontal and vertical, as long as a trailing commodity is advanced in juxtaposition with the respective side of the leading commodity leaving the manufacturer's flap.

The step in applicant's method of initially subjecting the manufacturer's flap to a downward pressure to cause the flap to be placed in juxtaposition with the other free end or flap of the sleeve can be carried out in any suitable manner.

According to a preferred embodiment particularly suitable for a continuous packaging operation, the manufacturer's flap is juxtaposed by a mechanical lever or finger operating in conjunction with the subsequent step of applicant's method wherein the trailing commodity is advanced into the desired relative position and mechancal lever or finger withdrawn.

Depending on the type of securing agent used, the downward pressure on the manufacturer's flap should always be sufficient to cause juxtaposition of the flap to the other free end of the sleeve. The amount of pressure required will also depend on the type of wrapper involved, i.e., kraft or corrugated board wrapper.

The type of securing agent used to secure the manufacturer's flap to the other end of the sleeve may be any suitable type for this purpose as commonly used in this art. Thus, for example, quick drying adhesives, contact adhesives, etc., may be used. Such securing agents may be applied to the manufacturer's flap in a prior operation, or if desired, just before the downward pressure is applied to the manufacturer's flap by suitable methods.

As outlined above, the trailing commodity is advanced into a position relative to the leading commodity before the pressure is removed from the manufacturer's flap, whereby the space between the trailing and leading commodities is such that it is less than the width of the manufacturer's flap. The purpose of this step is to prevent the manufacturer's flap from "springing-back" to a position where the trailing commodity, when advanced into juxtaposition with the respective side of the leading commodity, will not be capable of reapplying the flap to the other end of the sleeve of the first commodity. For this reason, the trailing commodity is desirably advanced into as close a proximity with the leading commodity as is commensurate with the removal of the downward pressure on the manufacturer's flap prior to abutting the leading commodity.

The step of advancing a trailing commodity into juxtaposition with the manufacturer's flap of a leading commodity may be performed by any suitable means. In a preferred embodiment, this is accomplished by utilizing the advancement of a partially wrapped commodity which is discharged from a prior wrapping operation whereby the steps of applicant's method may be sequentially timed to operate in conjunction with such prior operations.

The step of forming a sleeve wrapper about the commodity can be carried out by any of the commonly used methods of the prior art, or as taught in a U.S. Pat. 3,354,600. The lateral sides of the sleeve may be juxtaposed to the respective lateral sides of the commodity prior or subsequently to the wrapping method of the present invention, depending on the desired method of wrapping for the commodity.

Having thus described the method of this invention, reference will be made to the accompanying drawing, illustrating a preferred embodiment of carrying out the method.

In the drawing:

FIG. 1 is a side elevation of a device suitable for carrying out applicants' method;

FIG. 2 is a section taken along the line **2—2** of FIG. 1; and

FIG. 3 is a section taken along the line **3—3** of FIG. 2.

In the drawing, there is illustrated a device for performing the method of the present invention, in combination with other components which perform other packaging operations; and specifically the device shown carries out applicants' method as the last step in an overall packaging operation.

FIG. 1 illustrates a commodity wrapping device (according to U.S. Pat. 3,354,600) wherein a commodity is packaged by placing it on top of a wrapper blank B, fed by means of feed rollers **10** and **12** onto a downwardly moveable elevator platform **14** when the latter is at the upper or forward end of the stroke. On the downward or lower stroke, the elevator platform **14**, operating in conjunction with a pusher assembly P, lowers the commodity past opposed side wrapper folding means (one of which is shown by reference numeral **15**) whereby opposed side panels of the wrapper are juxtaposed to the respective sides of the commodity. During the finish of the downward stroke, the partially wrapped commodity is acted on by lateral side panel folding means **16** whereby the lateral sides of the wrapper are juxtaposed to the respective sides of the commodity.

Subsequently, the partially wrapped commodity is advanced by advancing means comprising a pusher **18** from the elevator platform **14**, where the top panel of wrapping material is juxtaposed to the top and sides of the commodity by striking roller bar **20** during its advancement. Therefore, the partially wrapped commodity, in arriving at the device to be described for carying out the method of this invention, has a wrapper blank wrapped about the commodity to form a sleeve with closed ends thereabout (and in the embodiment shown with the lateral side panels juxtaposed to the respective sides of the commodity, as indicated by reference numeral C″ in FIG. 3).

For illustrative purposes of applicants' method two such partially wrapped commodities C′ and C″ are shown, the former being the leading commodity, the latter the trailing. Initially, pusher **18** has advanced on a horizontal plane defined by plate **21**, partially wrapped commodity C′, produced as described above, into engagement with advancing means, defined by a pair of spaced apart belts **22** driven in unison by suitable means (not shown). Belts **22** are spaced apart a distance sufficient to impart tension on the partially wrapped commodity to insure complete control thereof at all times. When placed into engagement with the belts, the manufacturer's flap extends from the top wrapper panel, as indicated by **24** (FIG. 3).

Means comprising a pneumatic piston assembly **26** (mounted to frame F by bracket **27**) mounting arm **28** pivotable about rod **30** which in turn is journalled on frame F by housing **32**, serves to cause roller **34** to move up and down by actuation of the piston **26**, and constitutes pressure creating means for juxtaposing the manufacturer's flap **24** to the free end of the wrapper indicated by **25**.

In the embodiment shown, the manufacturer's flap **24** of the commodity C′, being advanced by belts **22**, is subjected to the downward pressure of the roller **34**, actuated by the piston **26** on the appropriate signal being given thereto. While leading commodity C′ is thus being advanced, with the manufacturer's flap **24** being subjected to the downwards pressure, trailing commodity C″ is being advanced by pusher **18**, onto the same horizontal plate **21**, at a speed greater than the speed of advancement of commodity C′. When trailing commodity C″ is in a position relative to the leading commodity C′, such that the distance D between the two commodities C′ and C″

is less than the width *d* of the manufacturer's flap **24**, the piston assembly **26** is actuated by suitable signal means, to cause roller **34** to remove pressure from the manufacturer's flap **24**, whereupon trailing commodity C'' abuts the leading commodity C' to retain the manufacturer's flap **24** in juxtaposition with the other end **25** of the sleeve. In practice, the commodity C' actually stops momentarily to permit removal of roller **34** when commodity C'' is in close enough proximity. When this is taking place, commodity C'' is also stopped momentarily (by the pusher **18** being halted) to permit roller **34** to be removed. Once both commodities are arranged in this relationship, and the roller **34** removed, the pusher **18** is then advanced and "over stroked" whereby the trailing commodity C'' is placed into juxtaposition with the leading commodity C'. In advancing the trailing commodity, the pusher places the commodities between the belts **22**. The belts **22** may be provided with a clutch to permit minor advancement of the belts by the action of the commodities advanced by the over stroking of the pusher **18**. Once this step is completed, the pusher **18** is returned and the belts **22** then control the advancement of the commodities. In a sequential operation, the trailing commodity will then become the leading commodity, and a subsequently partially wrapped commodity the trailing commodity, and the above steps repeated.

We claim:

1. The method of closing and sealing the trailing "manufacturer's" flap of a partially wrapped package comprising the steps of:

(a) continuously completed wraping packages in a tubular sleeve with a trailing manufacturer's flap extending from said sleeve parallel to a path-of-travel;

(b) conveying the partially wrapped packages serially in spaced relation along said path of travel;

(c) controlling the relationship between any two adjacent partially sleeve-wrapped packages for insuring that one package maintains the "manufacturer's" flap in closing relation over the adjacent end of the package, the improvement comprising:

(d) positively controlling the rate-of-travel of the leading partially sleeve-wrapped package along a path-of-travel,

deforming the trailing "manufacturer's" flap inwardly from the path-of-travel to intersect said path-of-travel while positively controlling the rate-of-travel;

(e) moving a trailing partially sleeve-wrapped package at a rate-of-travel greater than the controlled rate-of-travel of the leading partially sleeve-wrapped package and causing the trailing partially wrapped package to be forceably juxtaposed on the inwardly deformed "manufacturer's" flap and causing the same to adheringly engage the leading package.

2. The method as claimed in claim **1** including controlling the speed of movement of the trailing package in relation to the length which said "manufacturer's" flap trails for preventing the flap from returning to the original trailing position before it was deformed inwardly,

and moving both the trailing and leading packages at the same rate-of-speed after the adjacent ends of the respective packages are in juxtaposed relation.

3. The method as claimed in claim **2** in which the rate-of-travel of said leading package is controlled by endless belts disposed on opposite sides of the path-of-travel and respectively engageable with opposite sides of the leading package,

and the rate-of-travel of the trailing package is controlled by a reciprocating pusher operating in time unison with said endless belts, and controlling the rates of movement of both the leading and trailing packages in relation to mechanically operated means for deforming the trailing "manufacturer's" flap inwardly.

4. The method as claimed in claim **3** including momentarily halting movement of the leading package as well as the trailing package while the "manufacturer's" flap is deformed inwardly and thereafter, and overspeeding the trailing package along the path of travel, and subsequently moving both packages by the opposed endless belt when the adjacent ends of the packages are in juxtaposition.

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TRAVIS S. McGEHEE, Primary Examiner

U.S. Cl. X.R.

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