March 26, 1935. W. L. IRVINE 1,995,712

CUTTING MECHANISM

Filed Nov. 1, 1934

Fig. 1.

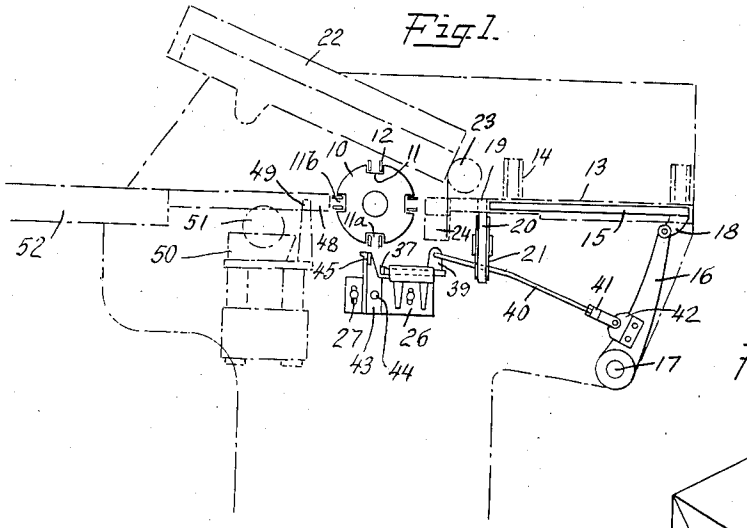


Fig. 2.

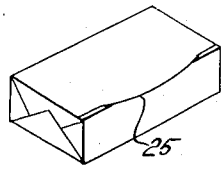


Fig. 3.

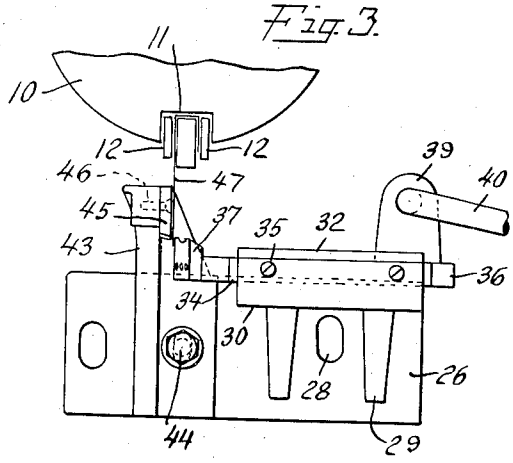


Fig. 5.

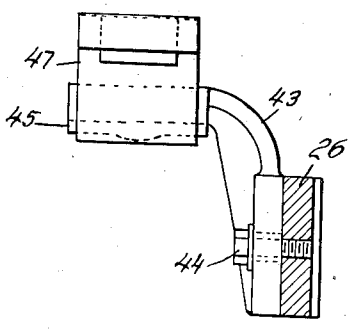


Fig. 4.

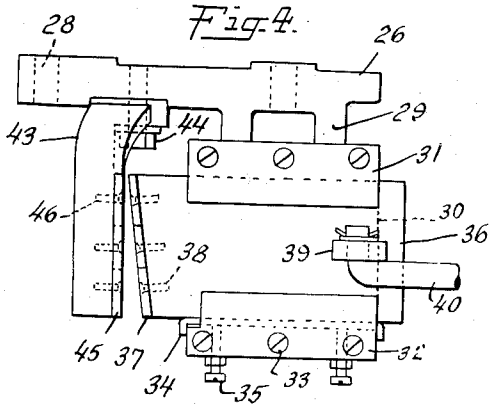
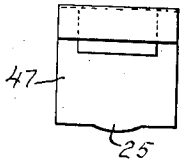


Fig. 6.



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UNITED STATES PATENT OFFICE

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CUTTING MECHANISM

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Application November 1, 1934, Serial No. 750,974

13 Claims. (Cl. 93—2)

This invention relates to wrapping machines of the type in which previously cut wrappers or labels are applied to objects and folded to enclose them in a series of operations. More particularly, the invention is concerned with a novel cutting mechanism for use on such machines and operating to cut or trim a portion of the wrapper to give it a shape by which its subsequent removal from the object is facilitated. The new cutting mechanism thus makes it possible for a wrapping machine supplied with ordinary rectangular wrappers to deliver wrapped articles, the wrappers of which have easy removal means, such as a finger tab, and while such articles could be produced on the wrapping machine by supplying it with wrappers cut to final form, such wrappers of irregular shape must be cut by means of dies or the like and the cost is much greater than that of rectangular wrappers which can be cut by shearing operations. By the use of the novel attachment, therefore, a more desirable wrapped product can be produced at substantially no increase in cost over that of similar products enclosed in ordinary wrappers.

The new cutting mechanism may be used advantageously in connection with wrapping machines in which the objects to be wrapped are introduced into chambers or pockets which move with a stepwise motion through a cycle of stations, each object as it enters its chamber picking up a label or wrapper and forcing the wrapper ahead of it into the chamber in such manner that portions of the wrapper project out of the pocket. Wrapping machines of this type are commonly used for wrapping sugar tablets and, accordingly, for purposes of explanation, an embodiment of the invention adapted for use with a wrapping machine of the kind mentioned which is suitable for wrapping sugar tablets will be described in detail, although it is to be understood that the utility of the invention is not limited to its use with machines of the specific construction to be described nor to the wrapping of any particular object.

One suitable wrapping machine now employed for wrapping sugar tablets includes a tumble box provided with a plurality of chambers or pockets and this box is rotated with a step by step motion to bring the chambers successively into registry with a feeding plunger. Tablets and wrappers are delivered into the path of the plunger by appropriate means and as the plunger engages and advances a tablet, the latter forces the wrapper ahead of it into the chamber. The mechanism is so arranged that the wrapper extends around three sides of the tablet and one end projects out of the chamber to a considerable extent. After insertion of the tablet and wrapper into the chamber, the tumble box is advanced a step to bring the filled pocket to a position in which the projecting portion of the wrapper may be acted on by the new cutting mechanism. This cutting mechanism preferably functions in synchronism with the plunger, and as the latter is advanced to introduce a tablet into the second chamber in the tumble box, the cutting mechanism removes a portion of the projecting end of the wrapper in the filled chamber and gives this portion of the wrapper a shape which facilitates its subsequent removal from the wrapped tablet. Upon the next advance of the tumble box, the tablet with its trimmed wrapper is advanced to a station where it is discharged from its chamber and delivered to folding devices which complete the wrapping operations and deliver the wrapped tablets.

For a better understanding of the invention, reference may be made to the accompanying drawing, in which

Figure 1 is a view in elevation of one form of sugar tablet wrapping machine with the new cutting mechanism applied thereto;

Figure 2 is a prospective view of the wrapped tablet illustrating the tab formed by the cutting mechanism;

Figures 3 and 4 are end elevational and plan views, respectively, of the cutting mechanism, on an enlarged scale;

Figure 5 is a front elevation of a part of the cutting mechanism; and

Figure 6 is a view showing the relative positions of the tablet and wrapper after the wrapper has been trimmed.

As illustrated in the drawing, the wrapping machine includes a tumble box 10 mounted for intermittent rotation on a horiontal axis and having four chambers or pockets 11, each of which is provided with gripping members 12, such as spring fingers. At one side of the tumble box is a housing 13 supported in any suitable manner, such as by brackets 14, on a convenient part of the machine, and within this housing reciprocates a plunger 15 actuated by an arm 16 mounted on a rock shaft 17 and connected to the plunger by a lug 18. The housing 13 has an opening 19 which lies beyond the forward end of the plunger when the latter is in fully retracted position, and the tablets are fed successively into the housing in front of the plunger by any suitable means, such for example, as a feed belt 20

trained around a pair of pulleys, one of which is designated 21. The tablets are placed upon this belt by the attendant and are advanced into the housing where they strike a suitable stop, such as the wall of the housing, and lie in position to be engaged by the plunger.

Mounted above the tumble box is a wrapper storage which may be an inclined guideway 22 which is kept filled with labels lying on edge in a stack. At the lower end of the guideway is a feeding wheel 23 which bears against the wrapper at the lower end of the stack and operates intermittently to discharge a label through an opening in the housing 13 and into a support 24 in which the wrapper stands on edge with its upper end in the path of the plunger.

At each period of rest of the tumble box a pocket 11 lies in the path of the plunger and as the latter advances, it engages a tablet and moves it toward the label in the support 24. In the continued movement of the plunger, the tablet with the wrapper ahead of it is forced into the pocket in the tumble box. In order to support the tablet and wrapper during their movement from the housing 13 into the pocket, the machine is provided with the usual plunger (not shown) which lies within the tumble box and advances out through the inner end of the chamber to engage the tablet as the latter is forced out of the housing. The plunger within the tumble box and the feed plunger cooperate to hold the tablet and wrapper so that they will not be displaced and will enter the chamber in the proper manner. Tumble boxes of the construction described and including the interior holding plunger are of standard commercial construction and need not be further described.

After the completion of the insertion of the tablet and wrapper in the chamber, the tumble box is advanced another step to bring the chamber 11 to the position indicated at 11*a*, and at this station the projecting end of the wrapper is trimmed by a suitable cutting mechanism to give it a shape facilitating its subsequent removal. In the construction described, a portion of the edge of the wrapper is removed so as to leave a tab 25, as illustrated in Figure 2, this tab extending slightly beyond the edge of the tablet so that it can be easily gripped and the wrapper torn from the tablet.

The cutting mechanism used for trimming the edge of the wrapper to produce the tab includes a plate 26 attached by means of bolts 27 to any convenient part of the machine, these bolts passing through slotted openings 28 so as to permit the plate to be adjusted up and down. Projecting outwardly from the plate are arms 29 supporting a base plate 30 which is provided with a channel in its upper surface and carries plates 31 and 32 overhanging the channel. A spacer plate 34 extends along one side of the channel and is held in adjusted position by adjustment screws 35. A slider 36 mounted in the channel is provided at one end with an upstanding blade 37 secured in place by screws 38 and at its other end, the slider has an upstanding lug 39 to which is connected one end of a link 40. The other end of the link is attached through an adjustment device 41 to a plate 42 on the arm 16 which actuates the feeding plunger. A bracket 43 mounted by a slot and bolt connection 44 on the face of the plate 26 carries a blade 45 which is attached thereto by screws 46, the blade 45 having its cutting edge along its lower edge, while the cutting edge of the blade 37 is at the top. The two blades act to trim the edge of the wrapper with a shear cut and for this purpose, the blade 45 lies parallel to the projecting portion 47 of the wrapper extending out of the chamber 11*a* while the blade 37 lies at an angle to the face of the wrapper.

In the operation of the mechanism, when the pocket containing the tablet with its projecting wrapper moves to the position 11*a*, the slider 36 and the feeding plunger 15 are in retracted position and the projecting end of the wrapper hangs down so that its lower edge lies just below the cutting edge of the blade 45. When the feed plunger 15 advances to move a tablet and wrapper into the pocket in registry with it, the slider 36 is also advanced and the shearing blades 37 and 45 cooperate to trim the lower edge of the wrapper of the tablet in the pocket 11*a* so as to provide it with the tab 25. When the feed plunger 15 is retracted by its arm 16, the slider 36 is likewise retracted and the tumble box then advances another step. As the tablet with the trimmed wrapper approaches the station 11*b*, the projecting portion of the wrapper strikes a portion of the guideway 48 and is folded down over the outer edge of the tablet. A plunger within the tumble box then forces the tablet and wrapper into the guideway in which are conveying means by which the tablet is carried along.

In the guideway the tablet passes by suitable folding devices of standard construction, one of which is indicated at 49, and these devices fold the ends of the wrapper against the ends of the tablet. Beneath the guideway 48 is a gluing mechanism generally designated 50 and including gluing wheels 51, and at the proper intervals this mechanism rises and falls so that the wheels apply adhesive to portions of the wrapper. During the progress of the tablet through the guideway, the wrapping is completed and the wrapped tablet is advanced through a dryer 52 which causes the glue to set. The details of the tablet and label feed, the tumble box, the folding mechanism, the gluing mechanism, and the dryer have been shown somewhat schematically and described only briefly since these parts of the machine are of conventional commercial construction and as such, form no part of my invention.

It will be apparent from the description of the new device, that it is simple and inexpensive in construction and that it may be used advantageously with a wrapping machine whenever a wrapped product which is provided with easy removal means is desired. Such products have been made heretofore in some instances by the use of labels cut to final form before being supplied to the wrapping machine, but labels of irregular shape which have to be die-cut are much more expensive than ordinary sheared labels of rectangular form, and their use adds to the wrapping cost. In order to overcome this objection, some machines have been developed in which the label is cut to final form, as for instance, during its travel from the label storage to the place where it is applied to the article, but these machines are more complex and expensive than that of my invention.

While I have illustrated the novel cutting mechanism in a form suitable for use with a wrapping machine of the tumble box type, it will be evident that it can be employed with appropriate minor modifications in machines of other constructions, in which the wrapper is applied in successive operations, during certain of which a portion of it is accessible for trimming by the new attachment.

What I claim is:

1. The combination with a wrapping machine which includes a plunger operating to force an object to be wrapped and a previously formed wrapper into a chamber with a portion of the wrapper projecting out of the chamber, of cutting means for cutting said projecting portion of the wrapper to give it a predetermined shape, and means for operating said cutting means while said plunger is in action.

2. The combination with a wrapping machine which includes a plunger operating to force an object to be wrapped and a previously formed wrapper into a chamber with a portion of the wrapper projecting out of the chamber, and means for reciprocating said plunger, of cutting means for trimming said projecting portion of the wrapper to give it a predetermined shape, and means actuated by said reciprocating means for operating said cutting means.

3. The combination with a wrapping machine which includes a plunger operating to force an object to be wrapped and a previously formed wrapper into a chamber with a portion of the wrapper projecting out of the chamber, and means for reciprocating said plunger, of cooperating cutting members for trimming said projecting portion of the wrapper to give it a predetermined shape, and means actuated by said reciprocating means for operating said cutting members.

4. The combination with a wrapping machine which includes a chamber movable through a plurality of stations and means at one station for introducing an object to be wrapped together with a previously formed wrapper into said chamber with a portion of said wrapper projecting out of the chamber, of cooperating cutting members at a later station for cutting said projecting portion to give it a predetermined form, and means for operating said members.

5. The combination with a wrapping machine which includes a chamber movable through a plurality of stations and means at one station for introducing an object to be wrapped together with a previously formed wrapper into said chamber with a portion of said wrapper projecting out of the chamber, of a stationary member and a movable member at a later station, said members cooperating to cut said projecting portion to give it a predetermined form, and means for moving said movable member into and out of cooperating relation with said stationary member.

6. The combination of a wrapping machine which includes chambers for receiving objects to be wrapped, said chambers being advanced step by step through a plurality of stations, and means at one station for introducing an object together with a previously formed wrapper into a chamber with a portion of the wrapper projecting out of the chamber, of cutting means at a later station operating to cut said projecting portion of the wrapper to give it a predetermined form.

7. The combination of a wrapping machine which includes chambers for receiving objects to be wrapped, said chambers being advanced step by step through a plurality of stations, and means at one station for introducing an object together with a previously formed wrapper into a chamber with a portion of the wrapper projecting out of the chamber, of a movable member and a stationary member operating at a later station to trim said projecting portion of the wrapper to give it a predetermined form, and means for moving said movable member to effect the trimming of said wrapper during a period of rest of said chambers.

8. In a wrapping machine, the combination of an intermittently rotating tumble box having pockets for receiving articles to be wrapped, a plunger operating in each period of rest of the tumble box to introduce an article and its wrapper into a pocket with a portion of the wrapper projecting, means for trimming the projecting portion of the wrapper to give it a predetermined shape, and means for operating said plunger and trimming means in synchronism.

9. In a wrapping machine, the combination of an intermittently rotating tumble box having pockets for receiving articles to be wrapped, a plunger operating in each period of rest of the tumble box to introduce an article and its wrapper into a pocket with a portion of the wrapper projecting, cutting means for trimming the projecting portion of the wrapper to give it a predetermined shape, said means comprising a pair of cooperating shearing members, and means for operating said plunger and cutting means.

10. In a wrapping machine, the combination of an intermittently rotating tumble box having pockets for receiving articles to be wrapped, a plunger operating in each period of rest of the tumble box to introduce an article and its wrapper into a pocket with a portion of the wrapper projecting, cutting means for trimming the projecting portion of the wrapper to give it a predetermined shape and including a stationary member, a slider, and a cutting member on said slider, said stationary and cutting member cooperating, and means for reciprocating said plunger and slider.

11. In a wrapping machine, the combination of an intermittently rotating tumble box having pockets for receiving articles to be wrapped, a plunger operating in each period of rest of the tumble box to introduce an article and its wrapper into a pocket with a portion of the wrapper projecting, cutting means for trimming the projecting portion of said wrapper including a stationary blade, a slider and a blade mounted on said slider, an oscillating arm reciprocating said plunger, and a connection between said slider and said arm.

12. In a wrapping machine, the combination of an intermittently rotating tumble box having pockets for receiving articles to be wrapped, a plunger aligned with a pocket in said tumble box when the latter is at rest and operating in each period of rest to introduce an article and its wrapper into said pocket with a portion of the wrapper projecting therefrom, means angularly displaced about the tumble box from said plunger and operating in a period of rest of said tumble box to trim the projecting portion of a wrapper, and means for operating said cutting means and plunger in synchronism.

13. In a wrapping machine, the combination of a plurality of pockets and means for introducing an article to be wrapped together with a wrapper into each pocket in succession, said wrapper contacting with three sides of said article and having a portion projecting out of the pocket, and means operating to trim the projecting portion of said wrapper to form an easy removal tab thereon.

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