Feb. 3, 1953 A. G. ROSE ET AL 2,627,154

WRAPPING MACHINERY

Filed April 20, 1950 2 SHEETS—SHEET 1

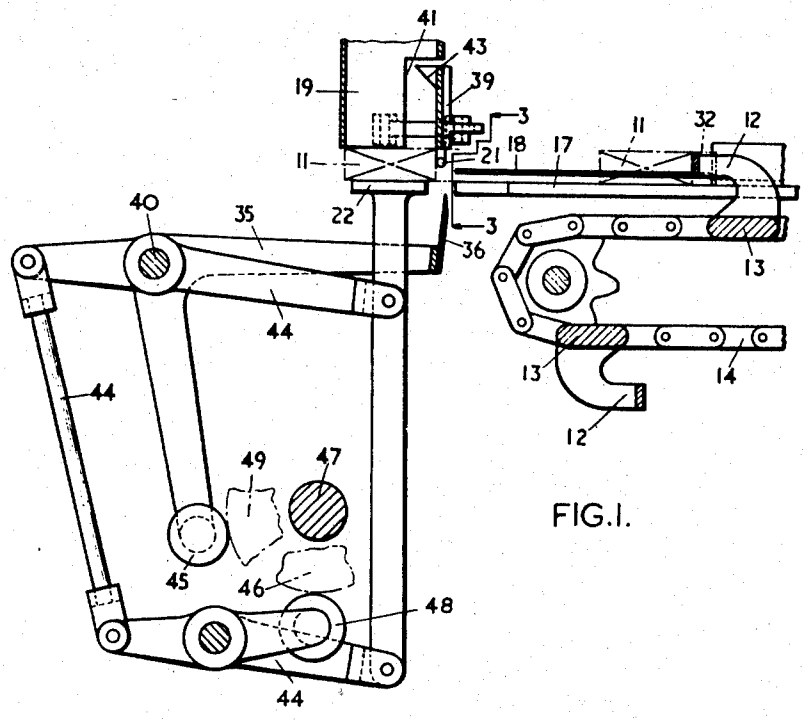


FIG.1.

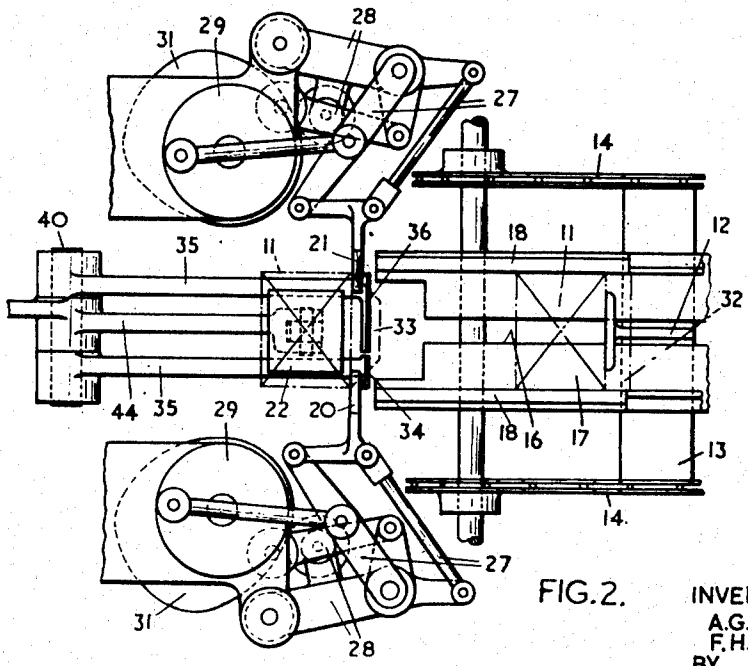


FIG.2.

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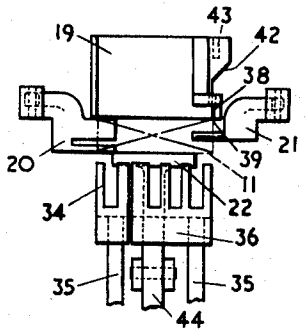


FIG. 3.

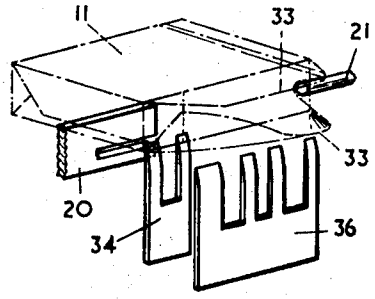


FIG. 5.

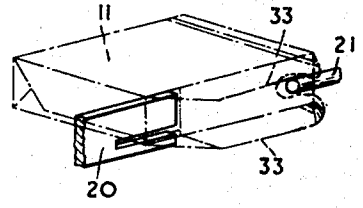


FIG. 4.

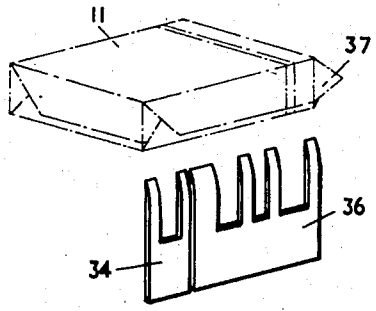


FIG. 7.

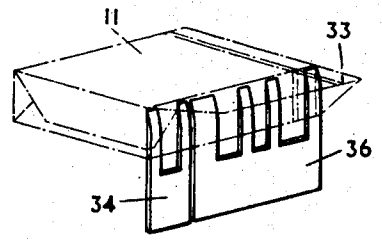


FIG. 6.

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WRAPPING MACHINERY

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4 Claims. (Cl. 53—124)

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This invention relates to wrapping machines for wrapping block-shaped articles, e. g., batches of cigarettes, or packets of cigarettes, in wrappers of cellulosic material, the machines being of the general type, described for example in U. S. A. Patent No. 1,618,025, wherein a spaced succession of articles are fed in timed relationship to the feeding of a succession of wrappers in a direction transverse to that of movement of the articles so that the forward end of each article in turn engages a wrapper and by further forward movement in co-operation with folding elements causes the wrapper to fold about the forward end, the upper and lower faces and the sides of the article so that the article is enclosed in an open-ended pouch. The partially wrapped articles are then transferred from the conveyor by means of a pair of transfer members disposed one on each side of the path of the articles and adapted to move synchronously into engagement with the rear face of the article and in so doing cause the portions of the wrapper extending from the sides of the article to fold inwardly to form side tucks, leaving end flaps extending from the upper and lower faces of the article. The end flaps are then folded on to the end of the article to form an end closure, and during the latter operation, the first end flap to be folded is normally folded over while the side tucks are still held by the tips of the transfer members as they are about to complete their retracting movement from the end face of the article, thus ensuring that the side tucks are trapped by the first-folded end flap.

The invention is concerned with the formation of the end closure in wrapping machines of the above type which will be referred to hereinafter as of the "type described."

According to the invention, there is provided a wrapping machine of the type described, wherein, after the tucking operation of the transfer members, the folding of the portion of the first-folded end flap adjacent one of the end tucks is delayed to allow that tuck to spring out to its unfolded position so that, upon folding over of the end flaps, a side flap is left projecting from the end face. To facilitate the springing out of the tuck, the transfer member on that side of the article must not be so wide as to cause definite creases in the wrapper, and is preferably in the form of a rod of circular cross-section considerably less in diameter than the thickness of the article.

In order to allow formation of the side tuck on the opposite side of the packet in the normal manner, the folding member for the first-folded

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end flap, e. g., the lower end flap, may be constituted by a pair of blades arranged to move in a plane containing the end of the article, the blade at the side where the tuck is to be formed commencing its folding movement while the side tuck is still held by the tip of the transfer member at that side as it is about to complete its retracting movement, while the folding movement of the other blade is delayed until the transfer member at that side is completely retracted and the tuck has sprung out to its unfolded position. The latter blade then moves to complete the folding of the lower end flap.

Upon folding of the upper end flap on to the already folded lower end flap, therefore, e. g., by pushing the article upwardly into a stacking magazine in known manner, a triangular side flap is left protruding from the end face of the article. Such side flap may be folded over on to the adjacent side of the wrapped article by a folding member during further movement into the stacking magazine.

The invention has been found particularly useful in the wrapping of packets of cigarettes in transparent cellulosic material when a tearing strip is introduced along one edge of the wrapper in a direction normal to the plane of the end closure so as to be folded around the article with the wrapper. By forming a side flap as described above the tearing strip is folded completely around the article and through the end closure without passing through any side tuck and its operation in assisting the removal of the wrapper from the article is greatly facilitated.

The invention will now be described in greater detail with reference to the accompanying diagrammatic drawings as applied to the wrapping of packets of cigarettes in transparent cellulosic material to which is secured along one edge a tearing strip.

In the drawings,

Figure 1 is a sectional elevation of an apparatus of the same general construction as that described in the above-mentioned specification,

Figure 2 is a plan of the same part of the apparatus as that shown in Figure 1 with certain parts of the upper structure removed for clarity of illustration,

Figure 3 is a sectional end view of the apparatus shown in Figure 1 taken along the line 3—3 in Figure 1, and

Figures 4, 5, 6 and 7 are a series of diagrams illustrating the final folding operations.

Referring first to Figures 1 to 3, articles 11 are fed to the machine by pushers 12 carried by

pusher bars 13 extending at spaced intervals between a pair of continuously driven chains 14, and each arranged to engage the rear face of an article. The pushers 12 extend through a slot 16 in a supporting platform 17 provided with a pair of side guides 18 which serve to retain the side folds of the packet after side folding and sealing operations.

The partially wrapped articles 11 are transferred from the pushers 12 along the platform 17 and into the base of a magazine 19 by a pair of tucking and non-tucking transfer members 20 and 21, respectively, arranged one on each side of the conveyor and arranged to move simultaneously into engagement with the rear face of each article in turn so as to move the article clear of the pusher 12 and along the platform 17 and on to a movable base support 22 of the magazine 19. The transfer members 20 and 21 are operated in known manner by a pair of parallel motion linkages 27 and 28 each under the influence of an eccentric 29 and a cam 31, the transfer members being first caused to accelerate so as to move the article 11 clear of the pusher 12 and then decelerate so as to discharge the article gently on to the support 22 of the magazine 19. The operating mechanism for such transfer members are well known and is fully described in the patent mentioned above.

During the transferring movement of the transfer members 20 and 21, the side of the rearwardly extending portions 32 of the wrapper are tucked inwardly on to the rear face of the article 11 leaving end flaps 33 projecting from the upper and lower surfaces of the article 11. In the case of the tucking transfer member 20, the side tuck is completely formed, the member 20 being substantially the same depth as the article, while in the case of the non-tucking transfer member 21, a portion only of the wrapper is temporarily held against the end face of the article, the transfer member 21 being in the form of a small cylindrical rod which merely serves the purpose of transferring the article on to the support 22 (see particularly Figures 4 and 5).

As the article 11 reaches the limit of its movement under the action of the transfer members 20 and 21 a first end folding blade 34 is caused to move upwardly partially to fold the lower of the end flaps 33 upwardly, this action taking place during the withdrawal of the transfer members 20 and 21, and while the side tuck is still held in position by the tip of the transfer member 20. These operations are best seen by reference to Figures 4, 5, 6 and 7. As the transfer members 20 and 21 move clear of the article, the folding blade 34 continues its upward movement to fold the adjacent end of the lower of the end flaps 33 against the end face of the article so as to trap the tuck formed by the transfer member 20, while a second folding blade 36 moves upwards to complete such folding action of the lower end flap. It will be seen that the movement of the folding blade 36 is delayed somewhat in relation to that of the blade 34 so as to allow the portion of the extending wrapper temporarily held by the transfer member 21 during its transferring action to spring outwardly as the transfer member is retracted, thus causing a doubled triangular portion of the extending wrapper to be left extending from the end face of the article as the second folding blade 36 moves across the face of the article (see particularly Figure 6). The folding blades 34 and 36 are carried by separate bell cranks 35 pivoted at 40 and each carrying a cam roller 45 arranged to bear against the face of a rotatable cam 49 secured to a cam shaft 47.

As soon as the operation of the second folding blade 36 is completed, the wrapped article is pushed upwardly into the magazine 19 by the movable support 22, such action causing the upper of the end flaps 33 to be folded downwardly on to the already folded lower end flap, thus causing a further doubling of the extending triangular portion to form a triangular tab 37. During the upward motion of the article by the support 22, the triangular tab 37 is caused to pass into a slot 38 formed between a tab folding member 39 and the adjacent wall of the magazine 19, the adjacent side wall of the magazine being cut away as shown at 41 to accommodate the folding member 39. During further upward movement of the article in the magazine as the next article is pushed upwardly by the support 22, the tab 37 is first caused to meet an inclined wall portion 42 of the folding member 39 which causes the tab to fold over through 90° so as to extend longitudinally of the article, the tab then being caused to meet a further inclined portion 43 of the folding member 39 which causes the tab 37 again to fold at right angles so as to lie along the end face of the package.

The movable support 22 is carried by a parallel motion linkage generally referred to be reference numeral 44 and is operated by a cam 46 mounted on the rotatable cam shaft 47, the cam 46 engaging a cam roller 48 carried by the linkage 44.

We claim:

1. A wrapping machine of the type described in which a conveyor is provided for passing a succession of articles and wrappers through a folding channel in which each wrapper is folded about its article in the form of an open-ended pouch with portions of the wrapper extending rearwardly from the sides and the upper and lower faces of the articles, said machine comprising a tucking transfer member of an effective width substantially equal to the thickness of the article and disposed on one side of the path of movement of the articles, a non-tucking transfer member of a width substantially less than the thickness of the article and disposed on the opposite side of said path of movement, operating means for causing said transfer members substantially synchronously to move in closed paths firstly into engagement with the rear end face of each article in turn, then forwardly to transfer the article from the conveyor to an end-folding station and then out of engagement with said end face, such movement of the tucking transfer member causing the portion of the wrapper extending from the adjacent side of the article to fold inwardly on to the rear end face of the article so as to form an end tuck while the movement of the non-tucking member causes the portion of the wrapper extending from the opposite side of the article to be temporarily held against said end face, an end-folding device, means operating in timed relationship with said operating means for causing said device firstly to move into engagement with the portion of the wrapper extending from a face of the article adjacent the end tuck to cause that portion to fold towards the rear end face of the article and then to complete the folding of said portion on to the rear end face of the article after the completion of the withdrawal of the transfer members, the withdrawing action of the non-tucking transfer member allowing said temporarily held portion of the wrapper to

spring outwardly partially to form a side flap extending from the rear end face of the article, and means for folding the portion of the wrapper extending from the opposite face of the article on to the rear end face of the article, such action completing the formation of said side flap.

2. A wrapping machine as in claim 1, wherein the end-folding device is constituted by first and second end-folding blades arranged to move substantially in a plane containing the end of the article, the operating means for said device causing the first blade to commence its folding movement while the side tuck is still held by the tip of the tucking transfer member as it is about to complete its retracting movement, while delaying the action of the second blade until the non-tucking transfer member is fully retracted.

3. A wrapping machine as in claim 2, wherein

said non-tucking transfer member is constituted by a rod of cylindrical cross-section considerably less in diameter than the thickness of the article.

4. A wrapping machine as in claim 1, comprising means for folding the side flap left extending from the rear end face of the article on to the adjacent side face of the article.

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