July 8, 1941. A. G. ROSE 2,248,724

WRAPPING OF CIGARETTES OR OTHER ARTICLES

Filed March 30, 1940

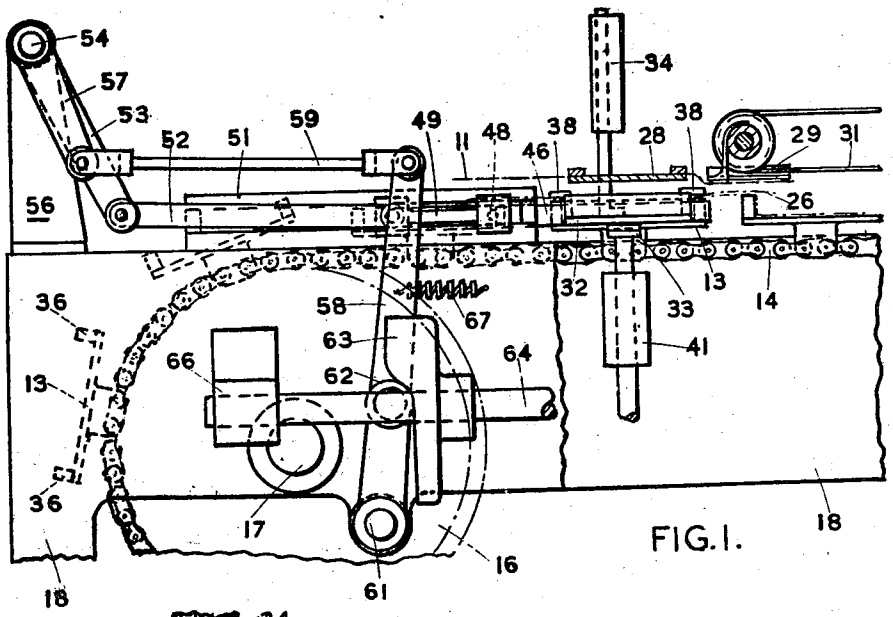


FIG. 1.

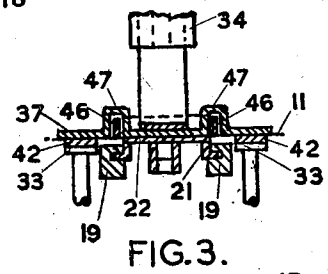
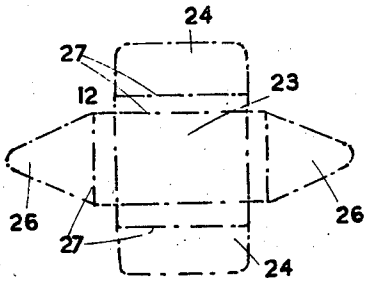


FIG. 3.



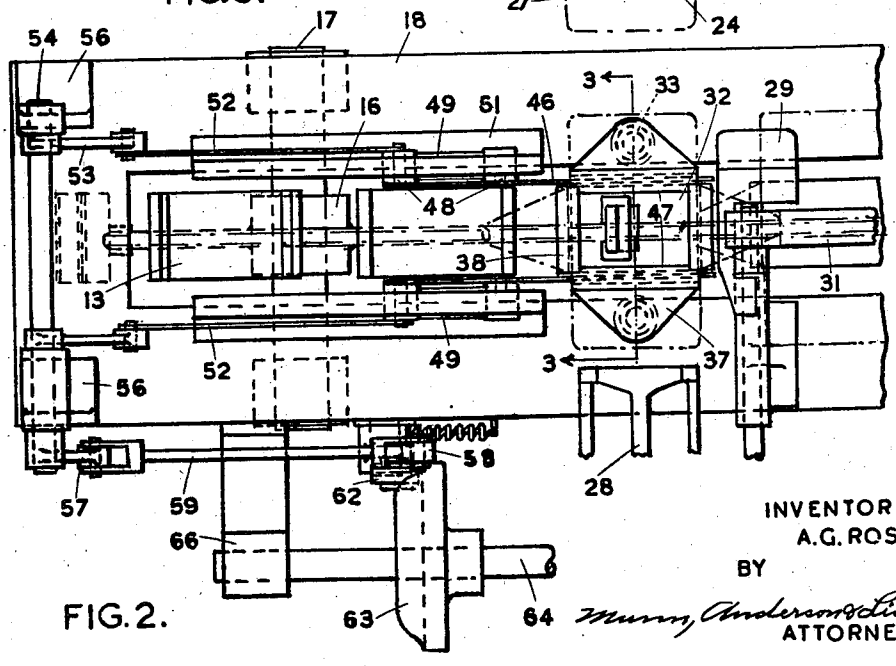


FIG. 2.

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Patented July 8, 1941

2,248,724

UNITED STATES PATENT OFFICE

2,248,724

WRAPPING OF CIGARETTES OR OTHER ARTICLES

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Application March 30, 1940, Serial No. 326,978
In Great Britain April 6, 1939

6 Claims. (Cl. 93—3)

This invention relates to the wrapping of articles, for example, a batch of cigarettes, and more particularly to the wrapping of articles to form packages for subsequent insertion into containers, for example, tin or cardboard boxes.

A type of wrapper commonly used for this purpose is provided with a pair of opposing side flaps which, during the wrapping operation, are brought together on the surface of the article. The term "wrapper" as used herein is intended to mean a wrapper of this type. The wrappers are made of paper, foil, or similar wrapping material and are usually of a flimsy nature and therefore difficult to manipulate.

It is an object of the present invention to provide, in an apparatus for wrapping articles in this kind of wrapper, means for effectively controlling the wrapper.

According to the present invention, an apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprises means for pressing the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket and retaining means adapted after operation of the pressing means to move into a position on top of the protruding flaps to retain the wrapper in the pocket during the withdrawal of the pressing means. Conveniently the retaining means is in the form of a pair of fingers adapted simultaneously to be slid in a direction parallel to the direction of travel of the conveyor into position adjacent the sides of the pocket. The pressing means is preferably in the form of a plunger disposed above the pocket and arranged to move into the pocket in a direction at right angles to the plane of the wrapper, the plunger being provided with two side portions extending over the side flaps of the wrapper, the wrapper-contacting surface of the side portions being bridged to allow for the passage of the fingers between the plunger and the wrapper. It is preferable also to provide a pair of nipping members arranged so as resiliently to nip the side flaps of the wrapper against the side portions of the plunger during the pressing of the wrapper into the pocket. The wrapper-contacting portions of the nipping members may be in the form of flat discs, preferably provided with rubber pads.

By way of example, one form of apparatus according to the invention will now be described in greater detail with reference to the accompanying diagrammatic drawing in which:

Figure 1 is an elevation, partly in section, of part of a cigarette wrapping machine;

Figure 2 is a plan view of the apparatus shown in Figure 1; and

Figure 3 is a sectional view of a detail of Figures 1 and 2, taken on the line 3—3 of Figure 2.

Referring to the drawings, wrappers 11 are fed successively from a stack 12 to open-sided pockets 13 mounted on an endless conveyor chain 14 by a wrapper-feeding device (not shown). The conveyor chain 14 is supported on sprockets 16 (one only shown) mounted on shafts 17 in the framework 18 of the machine, and is guided by rails 19 co-operating with lugs 21 extending from the bases 22 of the pockets 13. The chain 14 is driven intermittently in synchronism with the wrapper-feeding device by the sprockets 16 to present a pocket 13 to the wrapper-feeding device for each wrapper that is fed.

The wrapper 11 is of paper, foil, or similar material and consists of a base portion 23, opposing side flaps 24 and opposing end flaps 26. Scores or creases are formed along lines 27 to facilitate folding of the flaps.

The wrapper 11 is fed from the stack along a level somewhat higher than that of the pocket 13 (see Figure 1) towards the pocket, and as it approaches the pocket, it is met by a gripper device 28 which draws it into a position above the pocket 13 with the base portion 23 in registry with the pocket. During the feeding of the wrapper 11, the forward end flap 26 is guided by a plate 29 so as to pass beneath an endless travelling band 31, the lower lap of which is driven in the same direction and at the same linear speed as, or at a slightly greater speed than, the conveyor chain 14. The purpose of the band 31 will appear from later description. The wrapper 11 is then pressed into the pocket 13, which at this stage is stationary, by a plunger 32 co-operating with a pair of nipping members 33 in a manner that will be apparent from the following description of these parts.

The plunger 32 is mounted in a vertical slide 34 and is caused to reciprocate (by mechanism not shown) in synchronism with the wrapper-feeding device and the chain 14 so as to descend into a pocket 13 (as shown in Figure 1) each time a wrapper is fed. The base of the plunger is of such a width as to fit easily between end walls 36 of the pockets 13 and is provided with side portions 37 which, when the plunger is in a pocket 13, protrude from the open sides of the

pocket and extend over the side flaps 24 of the wrapper 11. Extending from the base of the plunger 32 in directions transverse to the side portions 37 are a pair of end flap guiding members 38, disposed at a height above the base 22 of the pocket 13 (when the plunger 32 is in its down position) somewhat greater than the height of the walls 36 of the pocket, so as to allow the guiding members 38 to extend over the end walls 36.

The nipping members 33 are disposed one below each side portion 37 of the plunger 32 in brackets 41 and are caused to reciprocate in synchronism with the plunger 32 (by mechanism not shown) about axes parallel to the axis of reciprocation of the plunger so that, when the wrapper reaches its position above the pocket 13 in the plane of feed of the wrapper, as shown by dash lines in Figure 1, its side flaps 24, projecting beyond the sides of the pocket 13, are nipped between the side portions 37 of the plunger 32 and the nipping members 33. Rubber pads 42 are provided on the nipping members to facilitate nipping. The wrapper 11 thus nipped (see Figure 3) is then pressed into the pocket 13 by further movement of the plunger 32, the nipping members 33 maintaining contact with the wrapper and descending with the plunger 32 to the position shown in Figure 1.

During the pressing of the wrapper 11 into the pocket 13, the end flaps 26 of the wrapper are caused by the guiding members 38 to fold over the end walls 36 of the pocket 13 so that the forward end flap 26 overlaps the rearward end flap 26 of a preceding wrapper 11.

With the wrapper 11 thus pressed into position in the pocket 13 with the side flaps 24 protruding from the open sides of the pocket, a pair of parallel retaining fingers 46 are moved into position on the wrapper, one adjacent each open side of the pocket, to retain the wrapper in position in the pocket during the subsequent withdrawal of the plunger 32. In order to allow the retaining fingers 46 to be moved into position on the wrapper 11 while the plunger 32 is still in contact with the wrapper, the side portions 37 of the plunger are formed with bridges 47 (see particularly Figure 3) disposed so as to lie parallel to and one adjacent each open side of the pocket 13.

The retaining fingers 46 are of rectangular cross-section and are attached at points 48 to blocks 49 slidably mounted in guide brackets 51. Pivotally attached to each block 49 at the opposite side to that on which the finger 46 is secured is a link 52 which is pivotally connected at its other end to an arm 53 secured on a shaft 54 arranged to rock in brackets 56 attached to the framework 18. A further arm 57 secured to the shaft 54 is connected to a lever 58 by a connecting rod 59. The lever 58 is pivoted at 61 to the framework 18 and carries a cam roller 62 which is arranged to bear against the face of a rotatable cam 63 secured to a cam shaft 64 mounted in brackets 66 (one only shown) secured to the framework 18. Contact between the cam 63 and the cam roller 62 is maintained by a spring 67 attached to the lever 58 and to the framework 18.

It will be seen, therefore, that rotation of the cam 63 in synchronism with the plunger 32 causes the lever 58 to rock about its pivot 61, this motion being transmitted through the connecting rod 59 and arm 57 to the shaft 54 which in turn causes the arms 53, through the links 52, to slide the fingers 46 into and out of position on the wrapper 11.

After the fingers 46 have moved into position on the wrapper 11, the plunger 32 is caused to withdraw and the conveyor 14 then moves the pocket 13 forward to a filling station (during which movement the fingers 46 are withdrawn by the cam 63 for operation on the next succeeding wrapper) where a charge of cigarettes is fed, for example, by the apparatus described in British Specification No. 520,854 corresponding to British application No. 31,674 filed 2, November 1938. During this movement of the pocket 13, the forward end flap 26 of the wrapper 11 is maintained in its overlapping relation with the rearward end flap 26 of the preceding wrapper in the preceding pocket 13 by the travelling band 31, this control of the end flaps being maintained by the band 31 until the pocket reaches a folding station (not shown) where the end flaps 26 are turned over on to the surface of the cigarettes and the side flaps 24 on to the folded end flaps 26, the package then being completed by the application of a seal. The completed package is then inserted, either alone or together with one or more other packages, into a tin or cardboard box.

I claim:

1. Apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprising means for pressing the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket, retaining means arranged to hold the wrapper in the pocket during the withdrawal of the pressing means, and means operating in timed relation to the pressing means to move the retaining means into a position on top of the protruding side flaps of the wrapper while the wrapper is held in the pocket by the pressing means.

2. Apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprising means for pressing the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket, a pair of slidably mounted retaining fingers arranged to hold the wrapper in the pocket during the withdrawal of the pressing means, and means operating in timed relation to the pressing means for simultaneously sliding the retaining fingers in a direction parallel to the direction of travel of the conveyor into positions on top of the protruding side flaps of the wrapper and adjacent the sides of the pocket while the wrapper is held in the pocket by the pressing means.

3. Apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprising means for pressing the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket, a pair of slidably mounted retaining fingers arranged to hold the wrapper in the pocket during the withdrawal of the pressing means, and cam means operating in timed relation to the pressing means for simultaneously sliding the retaining fingers in a direction parallel to the direction of travel of the conveyor into positions on top of the protrud-

ing side flaps of the wrapper and adjacent the sides of the pocket while the wrapper is held in the pocket by the pressing means.

4. Apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprising a plunger disposed above the pocket and arranged to move into the pocket in a direction at right angles to the plane of the wrapper to press the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket, a pair of slidably mounted retaining fingers arranged to hold the wrapper in the pocket during the withdrawal of the plunger, and means operating in timed relation to the plunger for simultaneously sliding the retaining fingers in a direction parallel to the direction of travel of the conveyor into positions on top of the protruding side flaps of the wrapper and adjacent the sides of the pocket while the wrapper is held in the pocket by the plunger, the plunger being provided with two side portions extending over the protruding side flaps of the wrapper the wrapper-contacting surfaces of which are bridged to allow for the passage of the fingers between the plunger and the wrapper.

5. Apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprising a plunger disposed above the pocket and arranged to move into the pocket in a direction at right angles to the plane of the wrapper to press the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket, a pair of slidably mounted retaining fingers arranged to hold the wrapper in the pocket during the withdrawal of the plunger, means operating in timed relation to the plunger for simultaneously sliding the retaining fingers in a direction parallel to the direction of travel of the conveyor into positions on top of the protruding side flaps of the wrapper and adjacent the sides of the pocket while the wrapper is held in the pocket by the plunger, the plunger being provided with two side portions extending over the protruding side flaps of the wrapper the wrapper-contacting surfaces of which are bridged to allow for the passage of the fingers between the plunger and the wrapper, a pair of resilient nipping members between which and the side portions of the plunger the wrapper is nipped during the pressing of the wrapper into the pocket, and means operating in synchronism with the plunger for moving the nipping members firstly towards the plunger to nip the wrapper in the line of feed of the wrapper and then in the same direction as the plunger during the pressing operation.

6. Apparatus for wrapping cigarettes or other articles of the type in which a movable conveyor provided with a series of open-sided pockets is driven in synchronism with a wrapper-feeding device to present a pocket to said device for each wrapper that is fed, comprising a plunger disposed above the pocket and arranged to move into the pocket in a direction at right angles to the plane of the wrapper to press the wrapper into the pocket with the opposing side flaps of the wrapper protruding from the open sides of the pocket, a pair of slidably mounted retaining fingers arranged to hold the wrapper in the pocket during the withdrawal of the plunger, means operating in timed relation to the plunger for simultaneously sliding the retaining fingers in a direction parallel to the direction of travel of the conveyor into positions on top of the protruding side flaps of the wrapper and adjacent the sides of the pocket while the wrapper is held in the pocket by the plunger, the plunger being provided with two side portions extending over the protruding side flaps of the wrapper the wrapper-contacting surfaces of which are bridged to allow for the passage of the fingers between the plunger and the wrapper, a pair of nipping members between which and the side portions of the plunger the wrapper is nipped during the pressing of the wrapper into the pocket, the wrapper-contacting surfaces of the nipping members being provided with rubber pads, and means operating in synchronism with the plunger for moving the nipping members firstly towards the plunger to nip the wrapper in the line of feed of the wrapper and then in the same direction as the plunger during the pressing operation.

ALFRED GERMAN ROSE.