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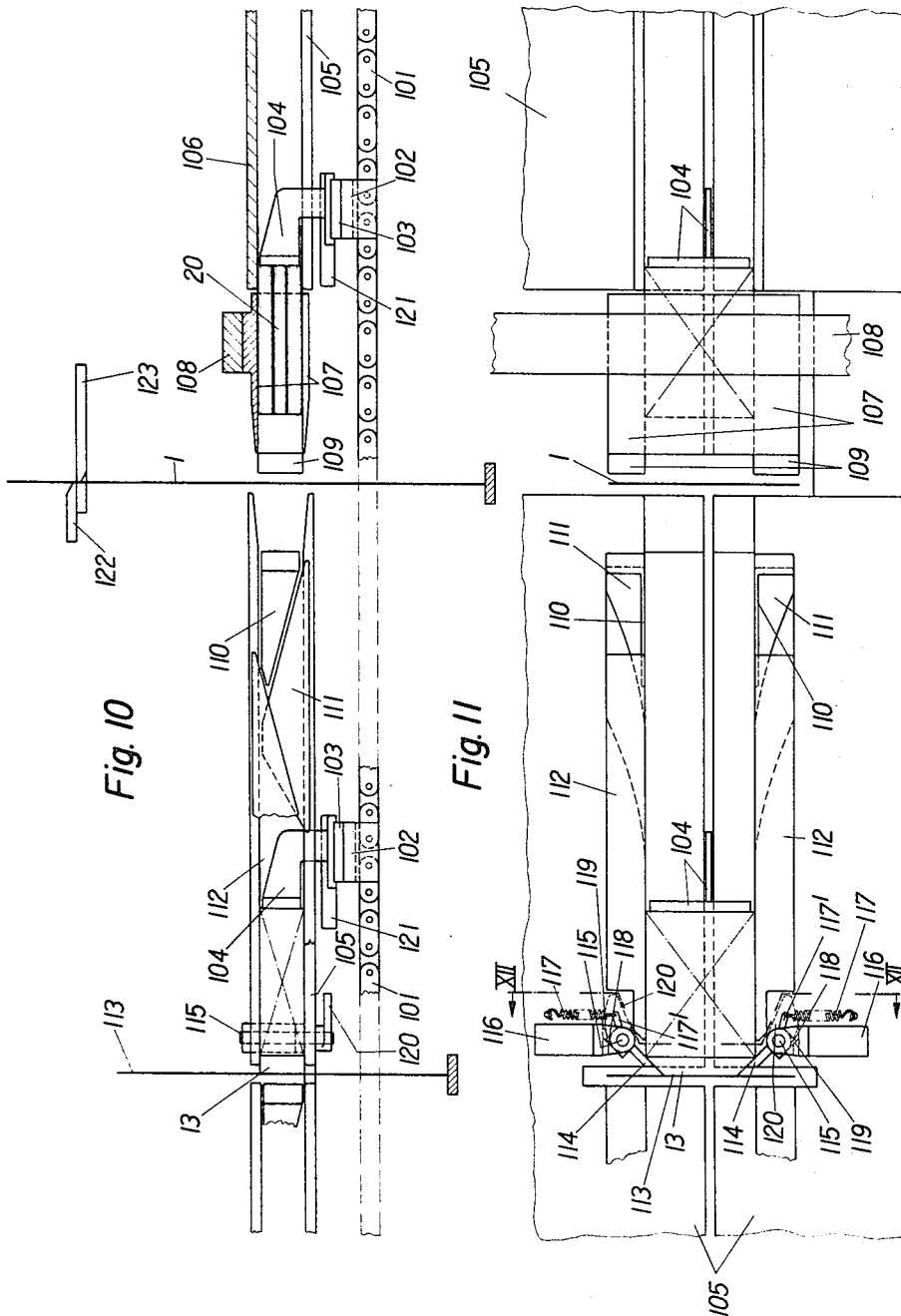
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3,412,520

METHODS OF WRAPPING BLOCK-LIKE ARTICLES

Filed July 16, 1965

3 Sheets-Sheet 2



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Fig. 12

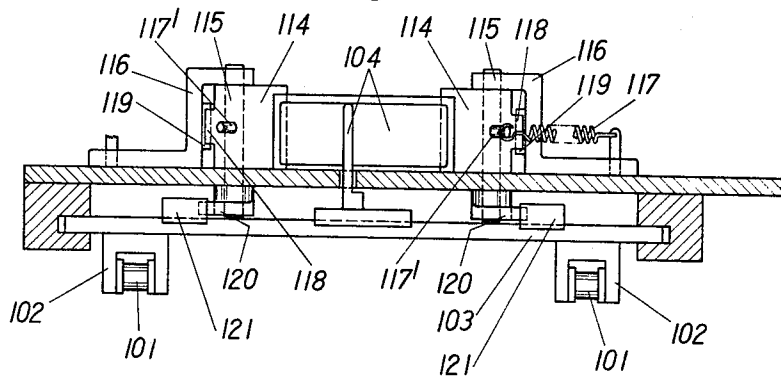


Fig. 13

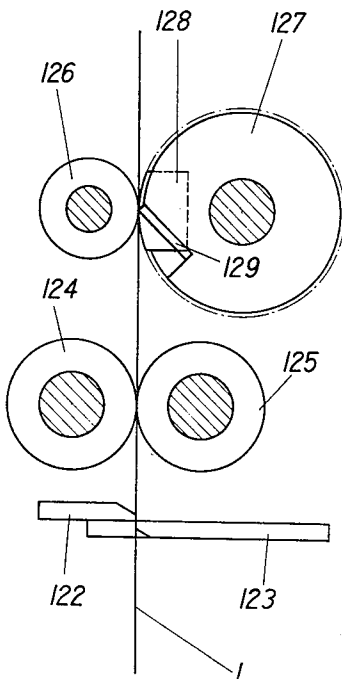
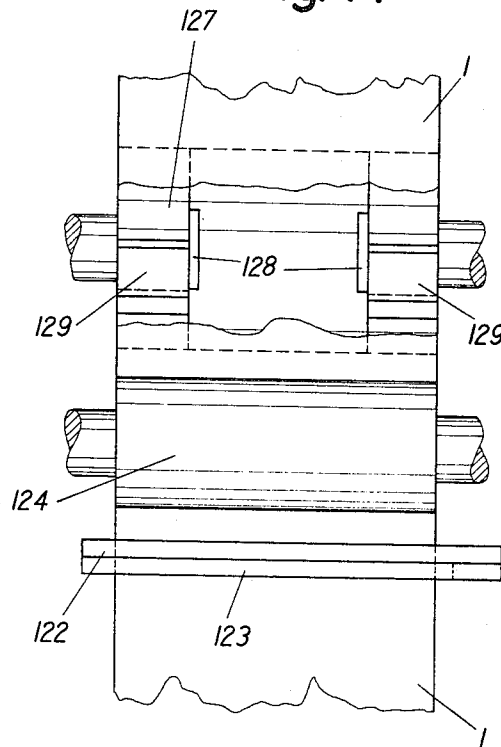


Fig. 14



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METHODS OF WRAPPING BLOCK-LIKE ARTICLES

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ABSTRACT OF THE DISCLOSURE

The disclosure relates to methods of wrapping block-like articles, such as blocks of cigarettes, wherein a wrapper blank that is longer and wider than an article to be wrapped is provided at each of two opposite sides with two slits of which one starts from the corresponding wrapper blank edge and the other is angular, preferably rectangular, to and meets the first slit, to form flaps at said opposite sides of the wrapper blank. The blank is folded about the article to be wrapped along two parallel lines connecting ends of said other slots. Protruding side portions of the wrapper blank carry the flaps. All the protruding side portions are turned to lie flat against the article, and the flaps protruding from side portions beyond the article are turned to lie flat against portions of the wrapper blank.

The invention relates to methods of wrapping block-like articles, and more specifically for wrapping blocks of cigarettes.

It is known in wrapping machines to feed a wrapper blank across a feed path of a block-like article and to fold the blank around the article so that in side view the blank is of U-shape. It is also known to provide two pairs of parallel slits one pair at each side, in the blank at the level where the base of the U joins the limbs of the U so that two flaps are formed which lie initially in the plane of the base and are extensions of the base. In order to facilitate further manipulating, the flaps are first bent forwards out of the plane of the base so as to lie in advance of the article while the blank is folded to lie against the sides of the article whereupon the flaps are bent back so as to lie on the wrapper at the sides of the article.

It is an object of the present invention to provide simplified methods of wrapping block-like articles.

It is another object of the invention to provide such methods which avoid bending flaps successively forwards and backwards.

It is a further object of the invention to provide such methods wherein flaps are formed which are extensions of side portions of the limbs of the U.

It is still another object of the invention to arrange the flaps on the limbs of the U in such a manner that when the blank is folded to lie against the sides of the article the flaps lie out of the plane of the base of the U and lie automatically in advance of the article.

It is still a further object of the invention to bend the flaps so as to lie flat against a base portion of the wrapper whereby any thickening of the side portions of the wrapper may be avoided.

These and other objects and advantages of the invention will become apparent to those skilled in the art from the following detailed description of two embodiments thereof, reference being made to the accompanying drawings which are given by way of example and in which:

FIG. 1 illustrates a wrapper blank provided with slits forming a T;

FIGS. 2, 3 and 4 illustrate three successive steps in

the wrapping of an article employing the blank of FIG. 1; FIG. 5 is similar to FIG. 4 but shows the wrapped article in a different view;

FIG. 6 illustrates a wrapper blank provided with slits forming an L;

FIGS. 7, 8 and 9 illustrate three successive steps in the wrapping of an article employing the blank of FIG. 6;

FIG. 10 somewhat diagrammatically illustrates a side view of a wrapping machine;

FIG. 11 illustrates a plan view of the machine of FIG. 10, some parts being omitted for clarity;

FIG. 12 illustrates a section along the line XII—XII of FIG. 11;

FIG. 13 somewhat diagrammatically illustrates a side view of a cutting device, of the machine of FIGS. 11 to 13; and

FIG. 14 illustrates a front view of the device of FIG. 13, some parts being omitted for clarity.

The wrapper blank 1 of FIG. 1 is of rectangular shape and is longer and wider than an article to be wrapped therein. The wrapper blank 1 is intended to be folded around a block-like article along the chain-dotted lines 3 to 8. More specifically, when the wrapper 1 is folded somewhat in the manner of a U around the article, the base of the U, hereinafter called the bottom part 13, lies between the lines 6 and 7 which are substantially parallel to each other. One limb of the U, hereinafter called the upper part 9, lies between the lines 3, 4 and 6; the other limb of the U, hereinafter called the lower part 10, lies between the lines 3, 4 and 7. Upper side parts 11 extend initially beyond the upper part 9, and lower side parts 12 extend initially beyond the lower part 10. Top parts extending beyond the lines 5 and 8 are indicated by reference numerals 11' and 12' respectively and have corner pieces 11A, 11B, 12A and 12B.

The blank 1 is provided with two pairs of slits 16 and 17, one pair at each side. The slits 17 extend along the lines 3 and 4 from the line 6 to the line 7, the lines 6 and 7 connecting corresponding ends of the slits 17. Each slit 16 starts from the respective edge of the blank 1, is perpendicular to the respective slit 17 and meets the same at the centre thereof. Each pair of slits 16, 17 forms a T and defines an upper flap 14A and a lower flap 14B. The upper flaps 14A are carried by the upper side parts 11 and the lower flaps 14B are carried by the lower side parts 12.

FIG. 2 shows a block 20 of cigarettes. A blank of the kind shown in FIG. 1 is bent around the cigarette block 20 in somewhat U-shaped manner by folding the blank along the lines 6 and 7 of FIG. 1, whereby the bottom part 13, the upper part 9 and the lower part 10 are formed, with the parts 11, 12, 11' and 12' protruding beyond the block 20. It will be noted that the flaps 14A and 14B are not carried by the bottom part 13, but are carried by the side parts 11 and 12 and, without any further bending, extend in the respective planes of the side parts 11 and 12 beyond the bottom part 13. As shown in FIG. 3, this enables the side parts 11 and 12 to be folded along the lines 3 and 4 of FIG. 1, without interference by the flaps 14A and 14B which merely are turned together with the side parts 11 and 12. The side parts 11 and 12 and also the flaps 14A and 14B now overlie each other. The overlying flaps 14A and 14B are subsequently bent to lie flat against the bottom part 13 as shown in FIGS. 4 and 5. Since the side parts 11 and 12 are clear of the flaps 14A and 14B they are not thickened by these flaps so that the wrapped article of FIGS. 4 and 5 can travel smoothly through a machine handling such article.

FIG. 6 is similar to FIG. 1 and illustrates a modified blank 202. Parts of the blank of FIG. 6 which are similar

to those of FIG. 1 are indicated by analogous reference numerals, which however have been increased by 200. Thus, for example, numeral 203 of FIG. 6 corresponds to numeral 3 of FIG. 1. The blank of FIG. 6 is provided with two pairs of slits 218 and 219, one pair on each side. The slits 219 extends along the lines 203 and 204. Each slit 218 starts from the respective edge of the blank 202, is perpendicular to the respective slit 219 and meets the same at an end thereof. Each pair of slits 218, 219 forms an L and defines a single flap 215A carried by the upper side parts 211. Again, the lines 206 and 207 are substantially parallel to each other and connect corresponding ends of the slits 219.

FIG. 7 shows a part of a blank of the kind illustrated in FIG. 6, which is bent in U-shaped manner by folding the blank along the lines 206 and 207 of FIG. 6, whereby the bottom part 213 and the upper and lower parts are formed with the flap 215A at each side carried by the respective side part 211, such flap 215A without any further bending extending in the plane of the respective side part 211 beyond the bottom part 213. As shown in FIG. 8, this enables the side parts 211 and 212 to be folded along the lines 203 and 204 of FIG. 6 without interference by the flaps 215A which merely are turned together with the side parts 211, the side parts 211 and 212 now overlying each other. Each flap 215A is subsequently bent to lie flat against the bottom part 213 as shown in FIG. 9.

The wrapper blanks of FIGS. 1 and 6 are primarily intended to form inner wrappings of cigarette packets.

The wrapping machine of FIGS. 10 to 14 comprises two roller chains 101 forming a feed conveyor driven in any suitable manner known per se. To the roller chains 101 transverse bars 103 are attached by means of holders 102. The transverse bars 103 carry push members 104 extending through a longitudinally slotted feed table 105 for acting on and pushing forwards cigarette blocks 20 along the feed table 105, the cigarette blocks 20 being guided by a top plate 106 and side plates forming a feed path.

A wrapper blank 1 is fed perpendicularly to the direction of feed of the cigarette blocks 20. Wrapper blanks of suitable length are cut from a web of material by cutters 122, and 123 and are slotted in the manner hereinbefore described with reference to FIG. 1 or FIG. 6. Details of the cutting and slotting arrangement will be described further below with reference to FIGS. 13 and 14.

Near the region where the blanks crosses the feed path for the cigarette blocks 20 and adjacent the blank 1, a guide 107 for the blocks 20 is provided, the guide 107 being reciprocable in the direction of the said feed path. The guide 107 serves to bend the blank 1 along the lines 6 and 7 of FIG. 1 or 206 and 207 of FIG. 6 when the end of the guide 107 adjacent the blank 1 moves beyond the plane of the blank 1. The guide 107 is reciprocated in timed relationship to the operation of the machine by a slide 108. Behind the region where the blank 1 crosses the feed path, folding means 110, 111 and 112 are provided which cause the side parts 11 and 12 of the blank 1 of FIG. 1 or the side parts 211 and 212 of the blank of FIG. 6 to be folded as indicated at FIG. 3. The wrapping machine so far described is conventional and therefore believed to need no further detailed description.

In accordance with the present invention, guide blocks 109 are fixed to the end of the guide 107 adjacent the blank 1. When the blank 1 is bent along the lines 6 and 7 of FIG. 1 or 206 and 207 of FIG. 6, the blocks 109 assist the flaps 14A and 14B of FIG. 1 or the flaps 215A of FIG. 6 to assume the positions shown in FIGS. 2 or 7 respectively, such flaps sliding along the blocks 109 when the guide 107 moves through the plane of the blank 1.

A folding finger 114 is provided at each side of the feed path beyond the guides 110, 111 and 112. The fingers 114

normally extend into the feed path and turn the flaps 14A, 14B or 215A from the position shown in FIG. 3 or FIG. 7 towards the bottom parts of the block 20. The fingers 114 are turnably mounted by means of spindles 115 mounted in bearing blocks 116. Two springs 117 are provided, each being anchored at one end to a frame of the machine and at its other end to a lever arm 117' rigid with the respective finger 114. The springs 117 urge the fingers 114 into the position shown in FIG. 11, in which a projection 118 bears against an abutment 119 of the respective bearing block 116 (see also FIG. 12). Underneath the feed table 105 each spindle 115 has a lever 120 which is arranged to contact projections 121 on the transverse bars 103 when any one of the push members passes the fingers 114, whereby the fingers 114 are turned out of the feed path after the flaps 14A, 14B or 215A have been turned against the bottom part 13 or 213 respectively. Thereby it is achieved that the fingers 114 are out of contact with the side parts 11, 12 or 211, 212 and do not damage the said side parts. The cigarette block 20 provided with an inner wrapping is now ready for being provided with an outer wrapping 113 which originally extends perpendicularly to the feed path (see FIGS. 10 and 11). On further movement of the cigarette block 20, the flaps being inclined to the bottom part 13 as shown in FIG. 11 impinge on the outer wrapping 113 and are turned thereby further so as to lie flat against the bottom part 13.

The cutting and slotting arrangement of FIGS. 13 and 14 comprises co-operating cutters 122 and 123 of conventional construction for severing a blank 1 of predetermined length from a web of wrapping material, feed rollers 124 and 125 feeding the web to the cutters 122 and 123. The slits 16, 17 of FIG. 1 or the slits 218 and 219 of FIG. 6 are made by a cutting roller 127 co-operating with a counter-roller 126. The cutting roller 127 carries a pair of cutter blades 128 extending in the radial direction of the roller for providing the slits 17 or 219 extending in the longitudinal direction of the blank 1. The cutting roller 127 also carries a pair of cutter blades 129 extending in the axial direction of the roller for providing the transverse slits 16 or 218. As shown, the cutting roller 127 serves for forming the T-shaped slits shown in FIG. 1. For forming L-shaped slits shown in FIG. 6 the cutter blade 129 should be displaced peripherally relative to the cutter blade 128.

From the foregoing description it will be seen that a known and conventional wrapping machine needs only slight alterations to perform the methods of wrapping hereinbefore described. The blocks 109 are fixed to the guide 107, the fingers 114 and the simple mechanism to operate the same and a device for cutting the slits have been provided.

Of course modifications are possible. For example the slits 16 and 17, or 218 and 219 need not be perpendicular to each other. It is possible to arrange these slits inclined under angles different from 90°. It should be clearly understood that further modifications, additions and omissions are possible without departing from the spirit of the invention.

I claim:

1. In a method of wrapping block-like articles, which comprises providing a wrapper blank that is longer and wider than a block-like article to be wrapped therein, slitting said blank at two opposite sides thereof so as to form flaps at said opposite sides, folding said blank around at least part of said article and turning portions of said blank which protrude beyond said article so as to lie against said article, the combination of forming a first slit at each of said opposite sides, said first slit starting from a respective edge of said blank, slitting said blank angularly to said first slit so that a second slit is formed at each of said opposite sides, said second slit meeting said first slit to form said flaps, folding said blank along

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two substantially parallel lines passing through ends of said second slits to wrap said blank around said article part, turning said protruding portions, which now carry said flaps, to lie against said article, and turning said flaps to lie against portions of said wrapper blank.

2. A method as defined in claim 1, wherein said first slit meets said second slit at an end thereof so that said slits are arranged in the shape of an L.

3. A method as defined in claim 1, wherein said first slit meets said second slit at the middle thereof so that said slits are arranged in the shape of a T.

4. A method as defined in claim 1, wherein said first and second slits are arranged perpendicular to each other.

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