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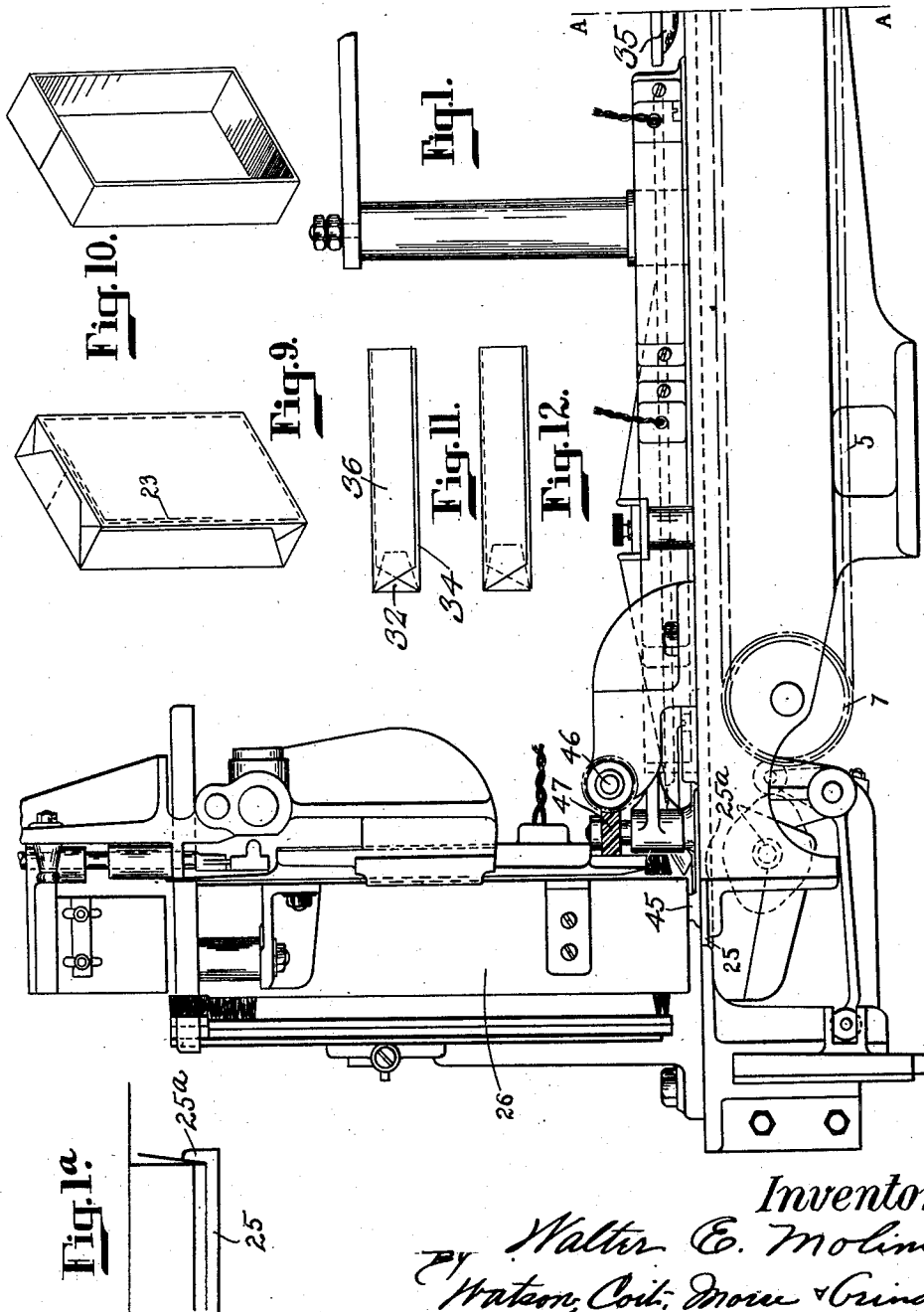
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1,784,701

MEANS FOR PACKING CIGARETTES AND LIKE ARTICLES

Filed May 2, 1927

5 Sheets-Sheet 1



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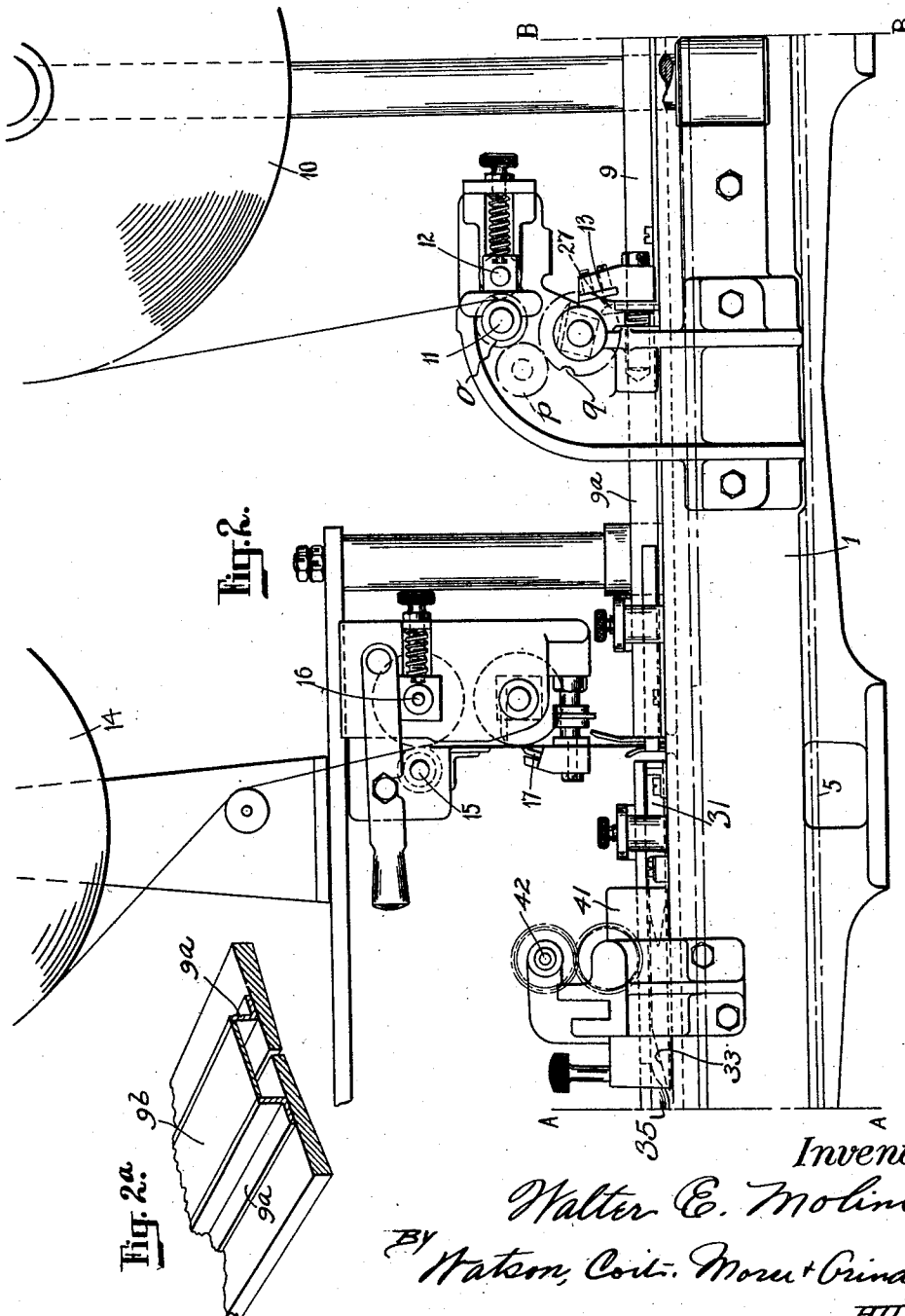
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5 Sheets-Sheet 3

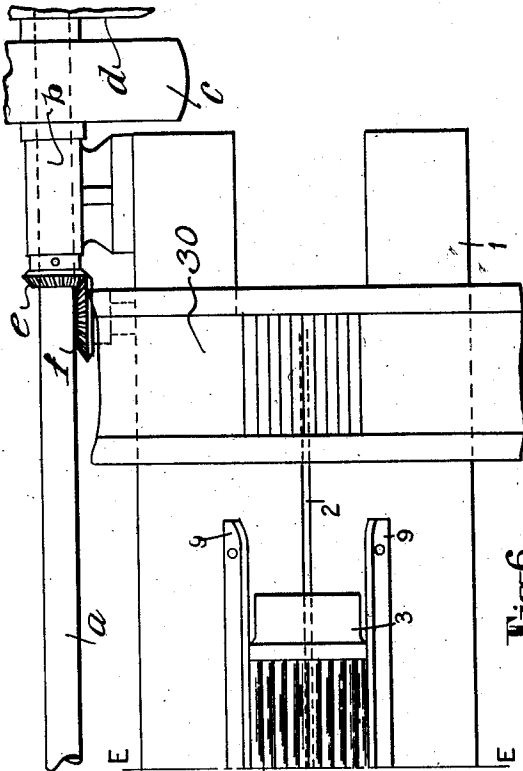


Fig. 6.

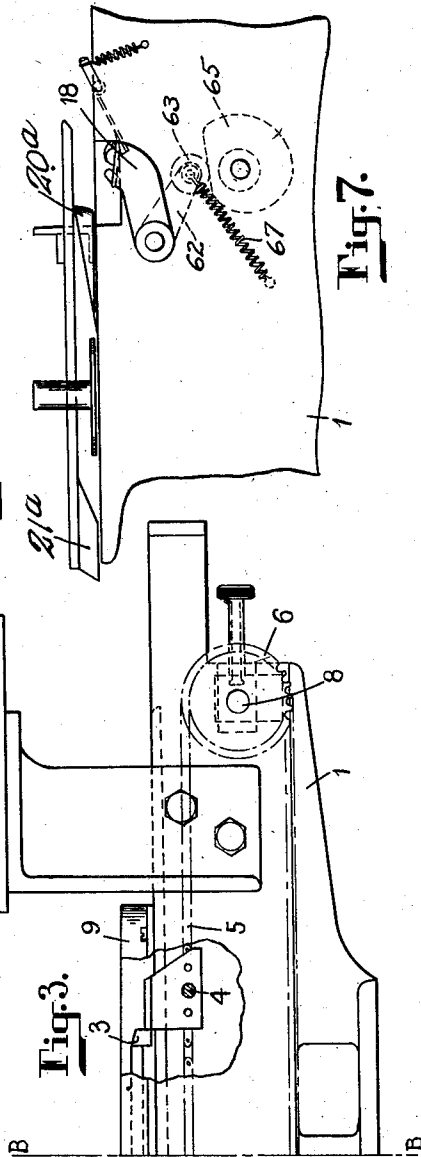


Fig. 7.

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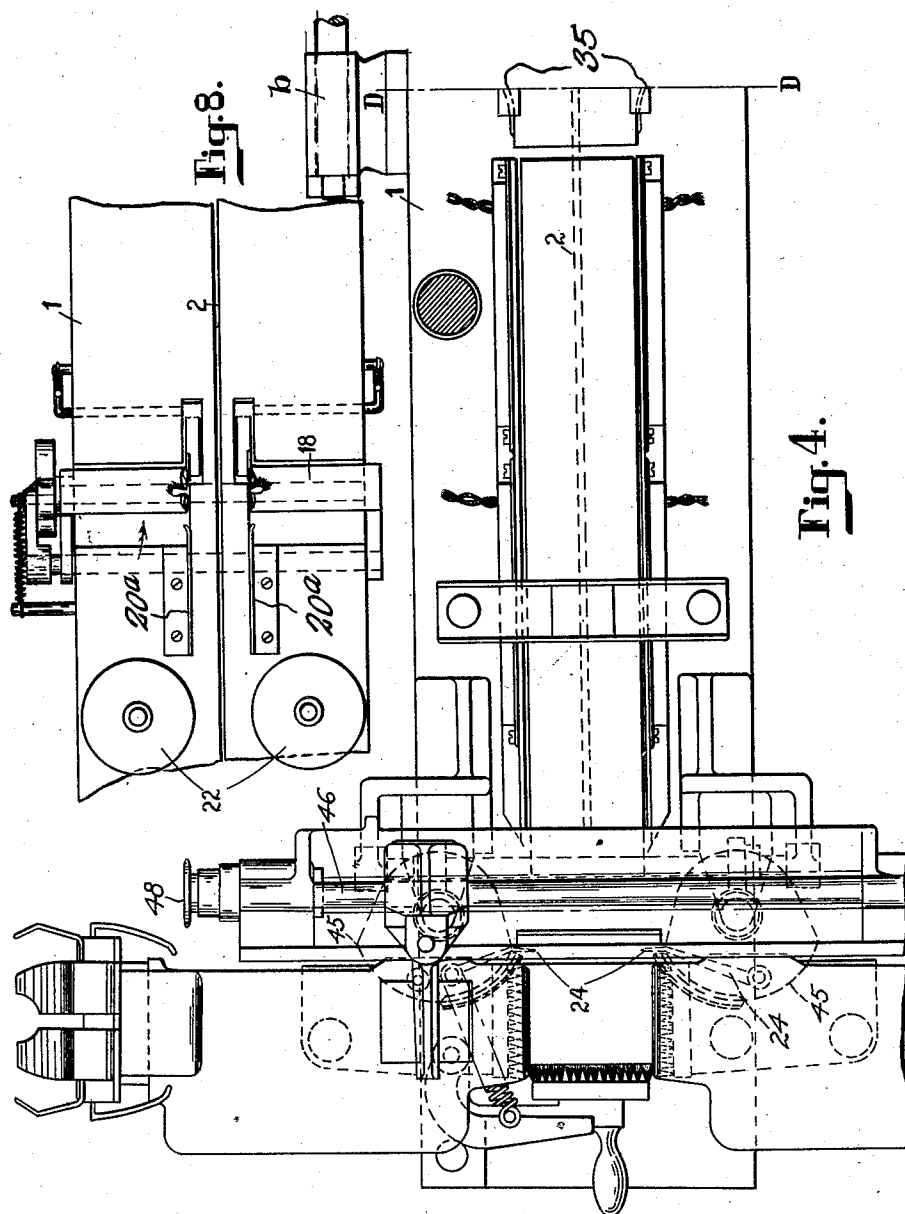
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MEANS FOR PACKING CIGARETTES AND LIKE ARTICLES

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5 Sheets-Sheet 4



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MEANS FOR PACKING CIGARETTES AND LIKE ARTICLES

Filed May 2, 1927

5 Sheets-Sheet 5

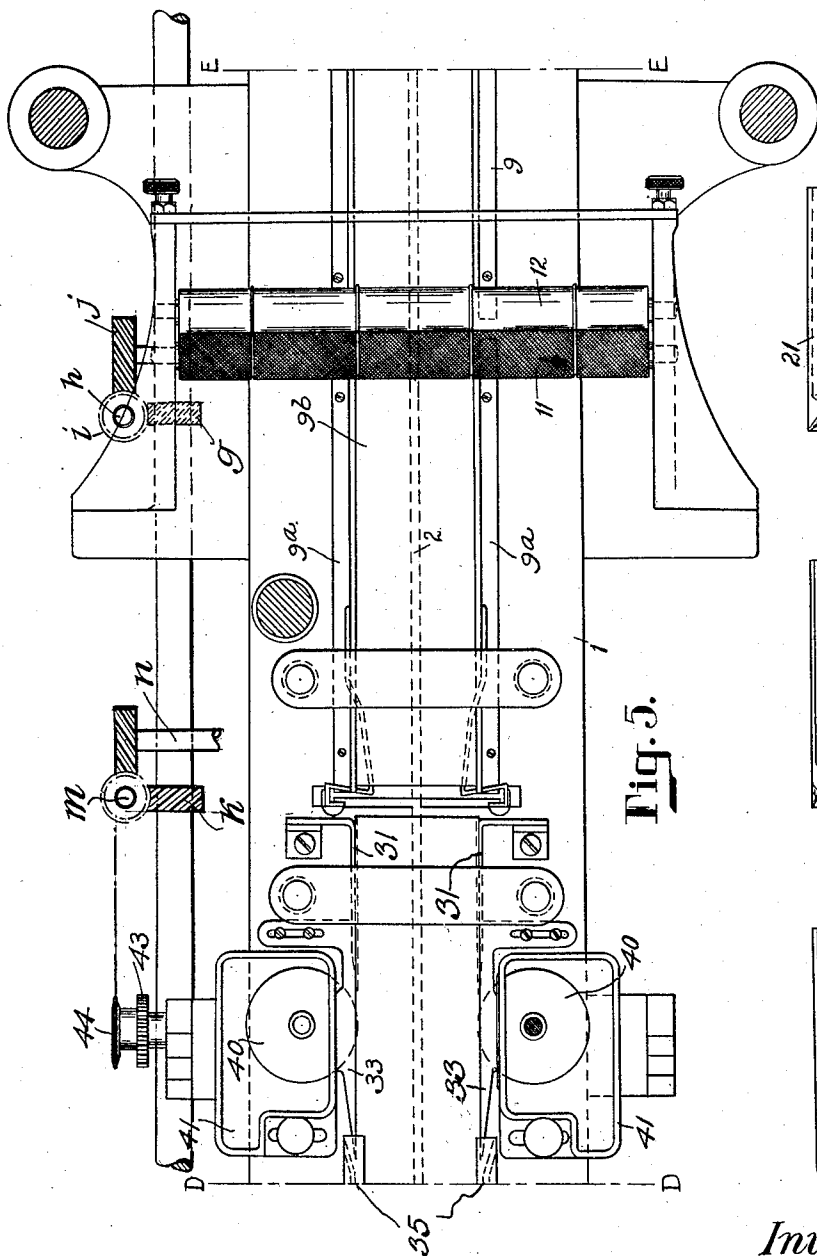


Fig. 5.

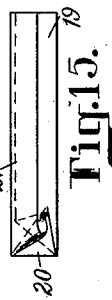


Fig. 13.



Fig. 14.



Fig. 15.

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UNITED STATES PATENT OFFICE

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MEANS FOR PACKING CIGARETTES AND LIKE ARTICLES

Application filed May 2, 1927, Serial No. 188,285, and in Great Britain May 6, 1926.

The present invention consists of means for producing automatically a package having a flexible outer covering reinforced by an internal strip of rigid material.

5 The present invention consists of a package making machine which comprises in combination means (for example an endless conveyor) operable automatically to move a block shaped article or batch of articles along the
10 bed of the machine, means for feeding and locating automatically a strip of rigid material (for example cardboard) transversely to the path of said article or batch of articles, means operable to fold the said strip
15 around three sides of said article or batch of articles, means for feeding and locating automatically a strip of wrapping material transversely to the path of said article or batch of articles with the longer dimension
20 thereof disposed at right angles to the direction of the longer dimension of said reinforcing strip and means for automatically forming said wrapping material into an open ended U shaped block ended container with
25 the reinforcing strip disposed around three inner side walls of the same.

The invention is more particularly described with reference to the accompanying drawings, in which:—

30 Figs. 1, 2 and 3 illustrate in side elevation sections of a complete machine constructed according to the present invention.

Fig. 1a is a fragmentary diagrammatic view of a portion of the mechanism for completing the folding operation.

35 Fig. 2a is a partial section in perspective showing the details of the strip folding mechanism.

Fig. 4 is a plan view of Fig. 1.

40 Fig. 5 is a plan view of Fig. 2.

Fig. 6 is a plan view of Fig. 3.

Figs. 7 and 8 are detailed views of the folding mechanism employed upon one embodiment of the present invention.

45 Fig. 9 illustrates a perspective view of a complete package formed by a machine constructed according to the present invention.

50 Fig. 10 is a perspective view of a reinforcing strip located within the completed package illustrated in Fig. 9.

Figs. 11 and 12 illustrate modified constructions of side tucks employed according to the present invention, and

Figs. 13, 14 and 15 illustrate the sequence of folding operations employed for performing and completing the side folds of a package formed according to Fig. 12.

In the embodiment of the present invention illustrated in the accompanying drawings, the machine comprises a bed 1 having a central slot 2 through which pusher pieces 3 of a chain conveyor are arranged to be moved. Each pusher piece 3 is secured to a spindle 4, the ends of which are connected to conveyor chains 5 carried on driving sprocket wheels 6 and idlers 7. The pusher pieces 3 are adapted to move beneath a hopper mechanism 30 so as to remove one or more rows of cigarettes from the vanes of the same and carry the same along the bed of the machine. The hopper mechanism is preferably constructed according to British Patents Nos. 216,326, 238,355, 253,300, and 263,521 and U. S. Patent 1,668,693, and the row or rows of cigarettes removed therefrom are moved between guide members 9 into engagement with a strip of rigid material, for example, cardboard fed downwardly from a reel 10 between feeding rollers 11 and 12 to a rotary cutting mechanism 13 which is arranged to shear a strip of material from the web equal in width to the depth of the row or rows of cigarettes removed from the hopper mechanism. The web of cardboard is such that its width corresponds to the longer dimension of the strip of material to be wrapped around the cigarettes. The mechanism for severing a strip of material from the web is preferably constructed according to British Patent No. 190,202 and U. S. Patent 1,700,906. The feeding rollers 11 and 12 are preferably arranged to score the web of cardboard at points along the width of the same so as to facilitate the folding of the cardboard strip around the batch of cigarettes. The strip of cardboard severed from the web rests between guides 27 in a vertical position upon the bed of the machine and is adapted to extend on either side of the path of the cigarettes. The cigarettes moved by the conveyor

carry the strip through a tunnel formed by side guides 9a, a top plate 9b and the bed of the machine, see Figs. 2 and 5. The side members of the cardboard strip are bent at right angles about the cigarettes by coming into contact with the edges of the guides 9a and 9b as the bunch of cigarettes forces the strip into the tunnel. The strip is then in the form of a U and extends across the leading face of the cigarettes and along either side thereof in such a manner that the free ends of the strip extend beyond the ends of the cigarettes which are in engagement with the pusher piece. The cigarettes together with the strip of rigid material are conveyed by the pusher piece 3 along the bed of the machine into engagement with a strip of wrapping material which is fed downwardly through the bed of the machine so as to lie across the path of the oncoming batch of cigarettes. If the wrapping material comprises a composite web of two materials, the material which comprises the inner wrapper is preferably narrower than the outer material so as to enable the sides of the outer wrapper to be secured to one another by adhesive. The wrapping material is drawn from a reel 14 by feeding rollers 15 and 16 and a strip of material is severed, by the cutting mechanism 17, from the web substantially as a batch of cigarettes meets the same. The cutting mechanism 17 is preferably constructed according to the British patents hereinbefore referred to and the end of the inner wrapper is perforated so as to allow the final broad end flap of the outer wrapper to be secured to the other broad end flap through the said perforation. The strip of wrapping material together with the batch of cigarettes are thereafter moved through folding mechanism which folds the strip of wrapping material into a U formation about the cigarettes so that the wrapping material is folded about the leading end of the batch of cigarettes and along the upper and lower broad face of the same. In order to accomplish this wrapping formation, the longer dimension of the strip of wrapping material is disposed in a direction at right angles to the longer dimension of the strip of reinforcing material, and the U shaped strip of wrapping material thereafter passes into engagement with the tucking and folding mechanism.

In the machine shown in Figs. 1 to 6 the folders for forming the side tucks of the wrapper are of the standard construction which is common in machines of this kind for producing folds of the character indicated at Fig. 11. The folding mechanism comprises a pair of side folders 31 (Figs. 2 and 5) which fold the narrow end tuck 32 (Fig. 11). The packet then passes between folders 33 which form the lower long tuck 34 (Fig. 11) and finally between folders 35

which fold down the long side tuck 36 (Fig. 11). This method of folding has certain drawbacks, because if the cardboard strip is pulled up from the completed packet, it cannot be pushed down again, as it will foul the narrow tucks 32 which are on the inside of the packet and the material is preferably folded in the sequence illustrated in Figs. 13, 14 and 15 by the mechanism shown in Figs. 7 and 8.

This sequence of operations enables the strip of reinforcing material to be moved relatively to the outer container without the danger of the strip fouling any protruding portion of the folded sides as is the case when the extensions of the bottom of the U are first folded along the sides of the cigarettes as illustrated in Fig. 11.

The said tucking mechanism for forming the container shown in Figs. 13, 14 and 15 comprises a pair of cam operated fingers 18. These fingers 18 may be driven in any conventional manner but are preferably operated by means of an arm 62 carrying the roller 63, this arm being rigid with the fingers 18. A cam 65, driven in any conventional manner from the main drive of the machine, engages the roller 63 which is held in contact with the cam by the spring 67. One of the fingers 18 is located on each side of the machine and timed in such a manner that when the leading end of each batch of cigarettes approaches the said fingers, the fingers are automatically moved upwardly so as to fold each side extension 19 of the lower limb of the U shaped wrapping material upwardly against the corresponding narrow side of the batch of cigarettes, at the same time maintaining the extensions 20 of the base of the U in a direction at right angles to the said narrow sides of the batch of cigarettes. See Fig. 13. The batch of cigarettes is thereafter moved into engagement with folders 20a which fold the side extensions 20 of the bottom of the U of wrapping material along the narrow sides of the batch of cigarettes see Fig. 14, whereupon the cigarettes are moved through a further set of folders see Figs. 12 and 15 which move the side extensions 21 of the upper limb of the U downwardly so as to form the wrapping material into a U shaped block ended container open at one end. See Figs. 12 and 15. It will be appreciated that instead of first folding each side extension of the lower limb of the U upwardly the side extensions of the upper limb of the U may be first folded downwardly without in any way departing from the spirit of the present invention, and such a sequence of folding operations are to be considered as the equivalent of the sequence shown in Figs. 13, 14 and 15.

Suitable gumming mechanism 22 is located in advance of the first tucking mechanism so as to ensure that the side folds are properly secured together. The gumming mechanism

22 comprises a pair of gum wheels 40 rotating in gum baths 41, the wheels projecting through slots in the sides of the gum baths in the manner described in my United States Patent No. 1,651,146. The gum wheels are driven by a horizontal shaft 42 which is shown in Fig. 2, but omitted from Fig. 5, the gum wheels being connected to said shaft by means of bevels, and the shaft 42 is driven by a gear 43 connected by a sprocket 44 to the main drive of the machine. The gum wheels project through slots in the folders 33 which form the lower long tuck of the packet, as previously described. The open ended package so formed is thereafter moved into engagement with mechanism adapted to move the package out of engagement with the conveyor so as to permit if necessary, side tucks and end folds to be formed at the open end of the container. Said mechanism preferably comprises the device set forth in British Patent No. 214,792, and consists of a pair of rotating wheels 45, Figs. 1 and 4, which are driven from a cross shaft 46 by gears 47. The shaft 46 is driven by a sprocket 48 from the main drive of the machine. Each wheel 45 is furnished with a hinged tucking finger 24 which is adapted to form the narrow side tucks on the open end of the package in the manner described in the above mentioned specification. The fingers 24 of the above device which form the side tucks of the package are arranged to bend the extensions of the reinforcing strip across the open end of the container so as to ensure that the container is provided with a reinforcing strip which completely envelops the narrow sides of the contents of the package.

After the side tucks have been formed at the end of the package the same is moved on to an upwardly movable platform 25. The platform 25 is provided with an upstanding lip 25a, Fig. 1, which folds up the lower broad end flap of the packet as the platform commences to rise and carry the package up into the magazine 26. The package is moved into a vertical stacker 26 which folds the upper broad end flap downwardly which is secured to the other broad end flap or to the side of the package in any desired manner. The packages in the vertical stacker are preferably removed therefrom either in line or in batches of a predetermined number by the mechanism described in British Patents Nos. 3,136 of 1926, 14,535 of 1926, 26,309 of 1926 and No. 934 of 1927.

A main shaft A is carried on the back of the machine in bearings B and is driven by a pulley C and is also fitted with a hand wheel D. A bevel wheel E drives the main conveyor through another bevel F. A spiral wheel G mounted on the shaft drives a vertical spindle H through another spiral I and a further spiral wheel on this vertical shaft drives another spiral J, which is fixed on the

spindle of roller 11. The roller 12 is driven from roller 11 by the friction of the paper.

Another spiral wheel K on the main shaft also drives the vertical spindle M in a similar manner and transmits the motion to a shaft N which drives the wrapper feeding roller 15.

The gumming gear is driven by a chain from the back of the wrapper feed.

The cutter 13 is driven from roller 11 by three gear wheels O, P, Q.

It will be appreciated that instead of moving a batch of cigarettes into engagement with a reinforcing strip and thereafter permit a U shaped block ended container to be folded about the said batch of cigarettes, the package may be formed about a block shaped former, and the open ended package may be removed from the said former in any desired manner. Such a package may be subsequently filled automatically or by hand.

If necessary, the rollers which feed the strip of wrapping material may be provided with a perforating device which will perforate a right angled portion upon the material, which, when the wrapping strip is folded about the contents, will be located in the manner indicated at 23 in Fig. 9. This perforated portion enables the package to be easily opened without the necessity of undoing the side tucks and end folds at the end of the package.

Thus it will be seen that according to the present invention, there is provided a package making machine wherein a U shaped block ended package formed from flexible material is provided with an inner reinforcing strip which retains the shape of the package and protects the contents of the package from being crushed.

It will be observed that the machine disclosed is designed to wrap a single article as well as a batch of cigarettes. For instance, in some machines of this type it is customary to use a block shaped form about which the wrapper is placed, the form being later withdrawn for the insertion of cigarettes. Obviously the machine might also be used to wrap some other article. In defining the wrapped member in the claims the term article is used, and this term is to be construed as including a single member or a plurality of members, such as a batch of cigarettes.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a package making machine, the combination with the machine bed, of means operable to move an article along the bed, means for feeding and locating a strip of rigid material transversely to the path of said article, means operable to fold the strip around three sides of the article, means for feeding and locating a strip of wrapping material transversely to the path of said article with the longer dimension thereof dis-

posed at right angles to the longer dimension of said reinforcing strip, and means for forming said wrapping material into an open ended U shaped block ended container with the reinforcing strip disposed around three inner side walls of the same.

2. In a package making machine, the combination with the machine bed, of means operable to move an article along the bed, means for severing a strip of rigid material from a web, the width of which corresponds to the longer dimension of the strip, means for locating the strip transversely of the path of the article, means operable to fold the strip around three sides of the article, means for feeding and locating a strip of wrapping material transversely to the path of said article with the longer dimension thereof disposed at right angles to the longer dimension of said reinforcing strip, and means for forming said wrapping material into an open ended U shaped block ended container with the reinforcing strip disposed around three inner side walls of the same.

3. In a package making machine, the combination with the machine bed, of means operable to move an article along the bed, means for severing a strip of rigid material from a web, the width of which corresponds to the longer dimension of the strip, said means comprising a rotary cutting blade and a cooperating fixed cutting blade, means for locating the strip transversely of the path of the article, means operable to fold the strip around three sides of the article, means for feeding and locating a strip of wrapping material transversely to the path of said article with the longer dimension thereof disposed at right angles to the longer dimension of said reinforcing strip, and means for forming said wrapping material into an open ended U shaped block ended container with the reinforcing strip disposed around three inner side walls of the same.

4. In a package making machine, the combination with the machine bed, of means operable to move an article along the bed, means for feeding and locating a strip of rigid material transversely to the path of said article, means operable to fold the strip around three sides of the article, said strip being of such length as to extend beyond the article at one side thereof, means for feeding and locating a strip of wrapping material transversely to the path of said article with the longer dimension thereof disposed at right angles to the longer dimension of said reinforcing strip, and means for forming said wrapping material into an open ended U shaped block ended container with the reinforcing strip disposed around three inner side walls of the same, and means for folding the strip across the end of the article.

5. In a package making machine, the combination with the machine bed, of means op-

erable to move an article along the bed, means for feeding and locating a strip of rigid material transversely to the path of said article, means for scoring the material during the feeding operation to facilitate folding, means operable to fold the strip around three sides of the article, means for feeding and locating a strip of wrapping material transversely to the path of said article with the longer dimension thereof disposed at right angles to the longer dimension of said reinforcing strip, and means for forming said wrapping material into an open ended U shaped block ended container with the reinforcing strip disposed around three inner side walls of the same.

6. In a package making machine, the combination with the machine bed of means operable to move an article along the bed, means for feeding and locating a strip of wrapping material transversely to the path of said article, means for folding the material in a U shape about the end, top and bottom of said article, and means for thereafter folding one of the side extensions of the U shaped material against the side of the article prior to the folding of the base of the U.

7. In a package making machine, the combination with the machine bed of means operable to move an article along the bed, means for feeding and locating a strip of wrapping material transversely to the path of said article, means for folding the material in a U shape about the end, top and bottom of said article, and means for thereafter folding one of the side extensions of the U shaped material against the side of the article prior to the folding of the base of the U, said last named means comprising a finger movable transversely of the plane of the bed.

8. In a package making machine, the combination with the machine bed of means operable to move an article along the bed, means for feeding and locating a strip of wrapping material transversely to the path of said article, means for folding the material in a U shape about the end, top and bottom of said article, and means for folding one of the side extensions of the U shaped material against the side of the article, and means for thereafter folding the material comprising the base of the U along the side of the article.

In testimony whereof I hereunto affix my signature.

WALTER EVERETT MOLINS.