May 12, 1970 H. KOCHALSKI 3,511,014

METHOD AND APPARATUS FOR PACKAGING BLOCK-SHAPED COMMODITIES

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Fig.1

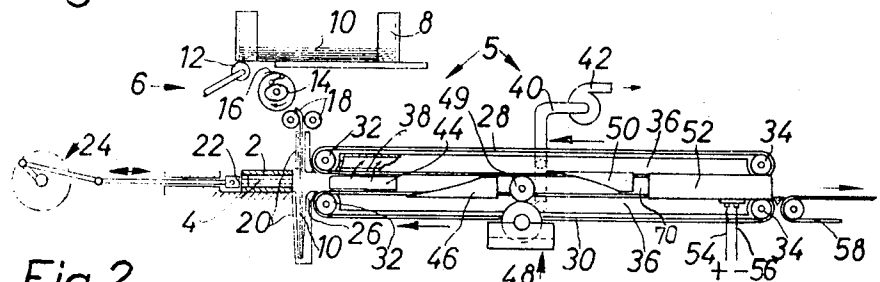


Fig.2

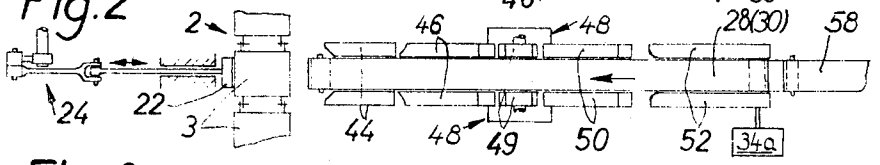


Fig.3

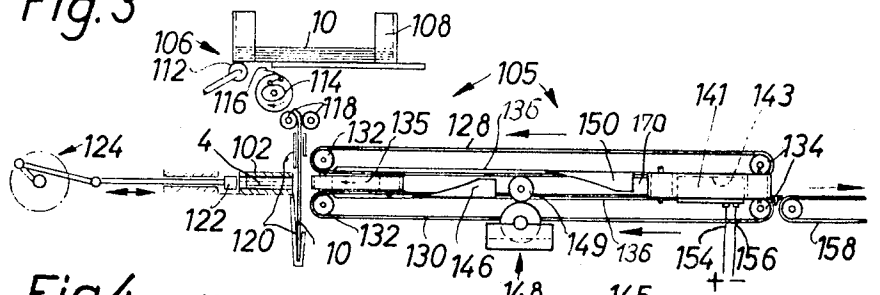


Fig.4

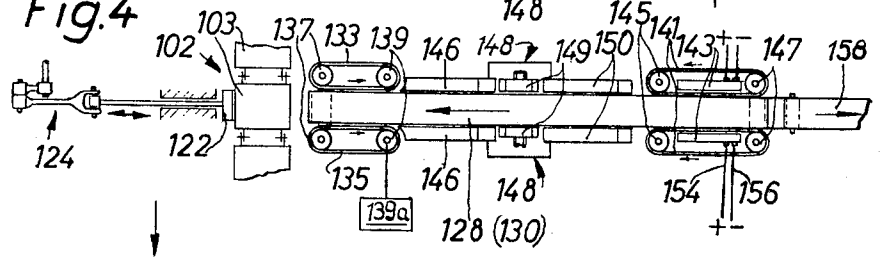
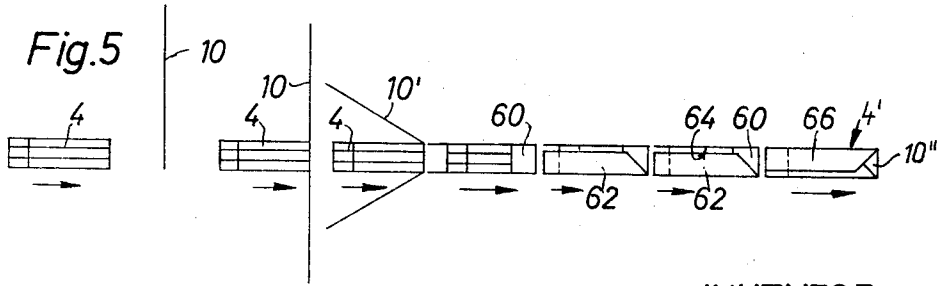


Fig.5



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METHOD AND APPARATUS FOR PACKAGING BLOCK-SHAPED COMMODITIES

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Int. Cl. B65b 11/16, 49/10
U.S. Cl. 53—24 17 Claims

ABSTRACT OF THE DISCLOSURE

Packaging apparatus for blocks of arrayed cigarettes or like rod-shaped articles includes a pair of transporting conveyors having endless belts whose inner stringers define an elongated channel for U-shaped blanks which are obtained by draping sheets of wrapping material around the front, top and bottom sides of successive blocks prior to or during entry into the channel. The inner stringers engage the top and bottom panels of blanks by friction and advance them through the channel past a series of tucking, folding adhesive-applying, sealing and pressing units which are laterally adjacent to the channel. The speed at which the blanks enter the channel exceeds the speed of the stringers and such stringers consist of foraminous material so that the blanks can be attracted thereto by suction. The tucking units may comprise fixed cams or travelling belts.

BACKGROUND OF THE INVENTION

The present invention relates to a method and apparatus for packing block-shaped commodities, particularly for packaging blocks of arrayed non-filter or filter cigarettes or other tobacco-containing rod-shaped articles in sheet-like wrappers to convert such wrappers into open-ended box-shaped envelopes.

Packaging machines for cigarettes normally comprise a transporting conveyor which advances hollow mandrels or like receptacles for blocks of cigarettes past a location where the sheets are fed into the path of successive mandrels to be draped therearound and to thereupon share further movement of mandrels past a series of tucking, folding, sealing, heating and other units. A serious drawback of such machines is that the mandrels will engage and entrain the sheets irrespective of whether or not they contain blocks of properly arrayed cigarettes. In the absence of blocks, the sheets will contaminate the machine and will require lengthy interruptions in the operation.

It is also known to advance blocks of cigarettes by means of motion transmitting strips, walls or paddles extending outwardly from an endless transporting conveyor which moves past one or more magazines so that its paddles can entrain successive blocks toward and into engagement with sheets which are to be converted into envelopes. The output of such machines is rather low, mainly because the paddles cannot engage the blocks at a speed which exceeds a rather low limit; otherwise, the paddles will subject the cigarettes to excessive deformation which can result in bursting of cigarette paper, excessive loss of tobacco particles at the ends, misalignment of cigarettes which form the blocks, and other undesirable consequences. Reference may be had, for example, to German Pat. No. 803,523 to Richter.

Furthermore, presently known packaging machines often subject the blocks to uneven deforming stresses so that the sides of the envelopes ultimately assume a trapeziform, rather than a truly rectangular shape. This interferes with proper grouping of cigarette packs in cartons and detracts from the appearance and sales appeal of the packs. Such problems are quite serious in packaging of filter cigarettes wherein the diameter of the filter tip normally exceeds the diameter of the tobacco rod.

It is an important object of my invention to provide a novel and improved method of engaging and advancing blocks of arrayed cigarettes or like commodities and sheet-like blanks past a series of processing locations at which the blanks are converted into open-ended box-shaped envelopes.

Another object of the invention is to provide a method according to which the blocks and the blanks can be fed and advanced past a series of processing locations at a speed which is considerably higher than the speed of blocks and blanks in presently known packaging machines.

A further object of the instant invention is to provide a method according to which the blanks can be converted into parallelepiped envelopes and wherein such conversion of blanks can be completed in a small area.

An additional object of the invention is to provide an apparatus which can be utilized in the practice of my method.

SUMMARY OF THE INVENTION

One feature of my invention resides in the provision of an improved method of applying sheets or wrappers around parallelepiped arrays of cigarettes or similar block-shaped commodities wherein the commodities are moved seriatim against successive sheets to convert such sheets into U-shaped blanks which are draped around and project laterally and rearwardly beyond the front, top and bottom sides or faces of the respective commodities prior to travel through a packaging station and past a series of successive processing locations where the projecting portions of the blanks are tucked, folded, pressed, coated with adhesive, sealed and heated to form open-ended box-shaped envelopes each of which conceals all but one side or face of the respective commodity. The improvement comprises the steps of frictionally engaging the blanks at two opposite sides of the respective commodities and transporting the thus engaged blanks through the packaging station. Such frictional engagement is preferably effected between the top and bottom panels of successive blanks on the one hand and a pair of surfaces travelling at the same speed and in the same direction to advance the blanks and the respective commodities past the processing locations. It is preferred to introduce the blanks into the packaging station at a speed which exceeds the speed of the surfaces and the blanks may be attracted to such surfaces by suction. The surfaces preferably converge in a direction away from the inlet of the packaging station so that the commodities are subjected to progressively increasing compression during travel past the processing locations. The means for tucking such portions of blanks which extend laterally beyond the front sides or faces of the respective commodities may include a pair of stationary cams or a pair of endless belts whose inner stringers engage the blanks and are driven at the speed of the aforementioned surfaces.

The novel features which are considered as characteristic of the invention are set forth in particular in

the appended claims. The improved packaging apparatus itself, however, both as to its construction and its mode of operation, together with additional features and advantages thereof, will be best understood upon perusal of the following detailed description of certain specific embodiments with reference to the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic side elevational view of a packaging apparatus which embodies one form of the present invention, the conveyor which supplies the commodities being shown in section;

FIG. 2 is a top plan view of the packaging apparatus with the feeder for sheets and certain other parts omitted;

FIG. 3 is a side elevational view of a second packaging apparatus, with the supply conveyor for commodities shown in section;

FIG. 4 is a top plan view of the second apparatus, with certain parts omitted; and

FIG. 5 is a diagram showing in side elevation the manner in which the sheets are draped, tucked, folded and sealed around a series of block-shaped commodities to form open-ended box-shaped envelopes.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIGS. 1, 2 and 5, there is shown a first packaging apparatus for parallelepiped blocks **4** of non-filter cigarettes, filter cigarettes or analogous rod-shaped articles. This packaging apparatus comprises a supply conveyor **2** which travels stepwise in a direction at right angles to the plane of FIG .1 and is provided with a series of open-ended pockets or cells **3** each of which accommodates a block **4** of twenty cigarettes each in the customary array, i.e., two outer layers or rows of seven cigarettes each and a median layer or row of six cigarettes which are staggered sideways with reference to the cigarettes of the outer layers. The conveyor **2** is driven at regular intervals to place successive blocks **4** into registry with the inlet of a channel **70** extending through a packaging or wrapping station **5**. A fixed mouthpiece **26** which defines a passage for one block **4** at a time is located directly in front of the inlet. During travel through the passage defined by the mouthpiece **26**, the cigarettes of the block **4** advance axially or lengthwise and are pushed by a suitable transfer member or plunger **22** receiving motion from an eccentric drive **24** which is synchronized with the drive for the conveyor **2**. The packaging apparatus further comprises a feeder **6** which serves to supply rectangular sheets or wrappers **10** into the path of successive blocks **4** in the region between the mouthpiece **26** and the conveyor **2**. The feeder **6** comprises a magazine or source **8** which accommodates a stack of sheets **10**, a rotary suction head **12** which is operative to withdraw the lowermost sheet from the magazine **8**, a rotary gripper **16** which engages the withdrawn sheet and feeds it into the nip between two advancing rolls **18** which advance the sheet vertically downwardly along a suitable guide **20**. The sheets **10** may consist of cardboard or paper one side of which is coated with aluminum foil or tin foil. The claws of the gripper **16** are operated by a fixed cam **14**. The construction of the feeder **6** is similar to that of feeders for paper sheets which are utilized in bookbinding machines.

When the plunger **22** performs a working stroke, it displaces a block **4** from the registering cell **3** and moves the front side or face of the block against a median portion of that sheet **10** which is held in the guide **20** so that the sheet is draped around the front, top and bottom sides or faces of the block and moves therewith through the mouthpiece **26** to enter the packaging station **5**. The thus draped sheet is converted into a U-shaped blank **10'** (see FIG. 5) which extends laterally and rearwardly beyond the front, top and bottom sides or faces of the respective block **4**.

The packaging station **5** accommodates a transporting conveyor including two endless friction belts **28, 30** whose slightly convergent lower and upper stringers define between themselves the aforementioned channel **70** in which the blocks **4** and blanks **10'** advance past tucking, folding and sealing units provided at a series of processing locations to convert the blanks into open-ended box-shaped envelopes **10''**. Each of the two friction belts is trained around a driven roller or pulley **32** and an idler roller or pulley **34**. The rollers **34** are driven continuously by a prime mover **34***a* which is shown in FIG. 2. The arrangement is preferably such that the speed of the blank-engaging surfaces on the stringers of the belts **28, 30** is somewhat less than the speed of the plunger **22** when the latter performs a working stroke and transfers a block **4** from the registering cell **3** into the inlet of the channel **70** between the belts **28, 30**. The belts **28, 30** are foraminous and prefereably consist of woven natural, metallic or synthetic plastic filaments. The packaging station **5** further accommodates two suction chambers **36** which are disposed between the upper and lower stringers of the belts **28, 30** to draw currents of air through the adjoining lower and upper stringers. The slots in the bottom wall of the upper suction chamber **36** are shown at **38**. Such slots **38** preferably extend in parallelism with the direction of travel of the belts. The upper wall of the lower suction chamber **36** is formed with similar slots. The suction chambers **36** also serve as back supports for the adjoining blank-engaging substantially horizontal stringers of the belts **28, 30** so that the stringers cannot yield upwardly and downwardly. Each suction chamber **36** is connected with a suction pipe **40**, and both suction pipes are connected to a fan **42** or another suitable suction generating device.

The aforementioned tucking, holding and sealing units of the packaging apparatus are provided at processing locations which are adjacent to the sides of the channel **70** between the belts **28, 30**. These units include a pair of fixed cam-like tucking units **44** which are located downstream of the mouthpiece **26** and serve to tuck in small pieces **60** of blanks **10'** which extend laterally beyond the front faces of the blocks **4**. The tucking units **44** are followed by two lower folding units **46** which also resemble stationary cams and serve to fold the lower flaps **62** which extend laterally beyond the bottom faces of the blocks **4**, such lower flaps **62** being folded through 90 degrees to abut against the lateral sides of the respective block. The folding units **46** are followed by two pasters **48** which include roller-shaped applicators **49** serving to coat the underside **64** of upper flaps **66** (such upper flaps extend laterally beyond the top face of the block **4**), and the pasters **48** are followed by two upper folding units **50** which are similar to the folding units **46** and serve to fold the adhesive-coated upper flaps **66** downwardly so that such upper flaps overlie the low flaps **62** and adhere thereto during travel past two pressing units **52** which bear against the outer sides of folded upper flaps **66** to expel moisture from the adhesive and to insure that the upper flaps **66** continue to adhere to the lower flaps **62**. Each pressing unit **52** is preferably constituted by an electric heater. The conductors which connect the pressing units **52** with a suitable source of electrical energy are shown at **54** and **56**. The units **52** also perform an ironing action and insure the formation of sharp creases between the flaps and the adjoining top and bottom panels of the blanks.

An endless conveyor belt **58** receives semifinished packs **4'** from the channel **70** between the belts **28, 30** and advances such packs to further processing stations. Each semifinished pack **4'** comprises a partially completed box-shaped envelope **10''** wherein portions of the sheet material extend all around beyond the rear side or face of the respective block. In other words, each pack **4'** which travels on the upper stringer of the belt **58** resembles a cigarette pack with one of its ends open. The manner in

which the open ends of envelopes 10'' obtained by conversion of blanks 10' in the channel 70 between the belts 28, 30 may be closed and sealed and provided with labels is known in the art. Reference may be had to the copending application Ser. No. 582,106, filed Sept. 26, 1966 by Willy Rudszinat et al. and assigned to the same assignee.

The operation is as follows:

The cells 3 of the supply conveyor 2 accommodate blocks 4 in slightly compressed condition. The conveyor 2 is advanced stepwise to place successive cells 3 into registry with the plunger 22. When the latter performs a working stroke, a complete block 4 of twenty cigarettes is expelled from the registering cell 3 and the front face of the block bears against the median portion of that sheet 10 which is held ready in the guide 20. The sheets 10 are fed in a manner which forms no part of the present invention, i.e., the rotary suction head 12 withdraws from the magazine 8 one sheet at a time and brings it into the range of jaws on the gripper 16. These arms deliver the sheet into the nip between the rolls 18 and the rolls advance the sheet along the guide 20 so that the sheet extends across the gap between the supply conveyor 2 and mouthpiece 26. The operation of the feeder 6 is synchronized with operation of the plunger 22 in such a way that a sheet 10 is located in the guide 20 when the plunger 22 performs a working stroke. When a cell 3 is empty or when the supply conveyor 2 is at a standstill, a suitable detector (not shown) which scans the cells stops the feeder 6 in a fully automatic way to avoid contamination of the packaging apparatus with unused sheets.

When the plunger 22 performs a working stroke and expels a block 4 from the registering cell 3, the thus displaced block automatically withdraws a sheet 10 from the guide 20 and forces it through the mouthpiece 26. This mouthpiece converts the sheet 10 into a U-shaped blank 10'. During further advance with the plunger 22, the block 4 (with a U-shaped blank 10' partially draped therearound) enters the channel 70 between the lower stringer of the upper friction belt 28 and the upper stringer of the lower friction belt 30 and is thereupon advanced with these stringers at a speed which is somewhat less than the speed of the plunger 22. The suction chambers 36 produce currents of air which attract the outer sides of the blank 10' against the adjoining surfaces of the respective stringers. The blank 10' moves with reference to the belts 28, 30 while the corresponding block 4 continues to receive motion from the plunger 22. Shortly after the latter has completed its working stroke, the blank 10' reaches the tucking units 44 which provide it with two tucks 60 (see FIG. 5). The folding units 46 bend the lower flaps 62 (FIG. 5) upwardly and the applicators 49 of the pasters 48 apply adhesive to the undersides 64 of the upper flaps 66 (FIG. 5). The folding units 50 thereupon bend the upper flaps 66 downwardly and the pressing units 52 expel moisture from the adhesive coats. The pressing units 52 impart the final shape to the tucks 60 and flaps 62, 66. The semifinished pack 4' then reaches the belt 58 and is advanced to the station where the open end of the envelope 10'' is tucked and folded to form the closed top of a finished pack. The finished pack is transported past a labelling station which applies a tax label over the closed top, and such packs are thereupon fed to a carton filling, bunching or other machine. In many instances, the packs are first advanced through a further packaging or wrapping apparatus to be provided with transparent outer envelopes and tear strips.

The stringers fo the belts 28, 30 exert against the blocks 4 a certain pressure which is transmitted by the upper and lower panels of the blanks 4'. The tucking units 44 are so close to the conveyor 2 that the cigarettes of the blocks 4 are always confined from both lateral sides to prevent collapse of the blocks.

FIGS. 3 and 4 illustrate a second packaging apparatus which is similar to the one shown in FIGS. 1 and 2 and wherein many parts are denoted by analogous reference numerals plus "100." For example, the numerals 102, 106, 120 and 128 respectively denote a supply conveyor for blocks 4, a feeder for sheets 10, a guide, and an endless friction belt of the transporting conveyor. Instead of the suction chambers 36 of FIGS. 1 and 2 backing plates 136 for the inner stringers of the friction belts 128, 130 have been provided.

In addition, the packaging apparatus of FIGS. 3 and 4 comprises a modified tucking unit including two lateral conveyors 133, 135 each trained around rollers or pulleys 137, 139 and adjacent to the inlet of the channel 170 between the friction belts 128, 130. The inner stringers of the lateral conveyors 133, 135 (namely, those stringers which are nearer to the belts 128, 130) converge in the direction of travel of the blocks 4 and the planes of such inner stringers are substantially normal to the planes of the lower and upper stringers of the belts 128, 130. The pulleys or rollers 139 are driven by a motor or transmission 139*a* in such a way that the speed of the belts 133, 135 equals the speed of the belts 128, 130. The width of the belts 133, 135 is slightly less than the height of the channel 170 between the belts 128, 130 so that the belts 133, 135 define with the belts 128, 130 horizontal gaps for the flaps 62 and 66. The inner stringers of the belts 133, 135 replace the tucking units 44 and cause the tucks 60 to lie flat against the respective lateral faces of the blocks 4.

The presssing units 52 of FIGS. 1 and 2 are replaced by modified pressing units each of which comprises an endless band 141 of metal and an electric heater 143 connected with a source of electrical energy by conductor 154, 156. The heaters 143 are located between the inner and outer stringers of the respective bands 141. The inner stringers of the bands 141 are normal to the inner stringers of the belts 128, 130. The bands 141 are trained around idler rollers or pulleys 145 and driven rollers or pulleys 147. The speed of the belts 141 is the same as the speed of the belts 128, 130.

The operation of the apparatus shown in FIGS. 3 and 4 is very similar to the operation of the previously described apparatus, with the aforementioned exception that the lateral belts 133, 135 replace the fixed tucking units 44 of FIGS. 1 and 2. In addition to forming the tucks 60, the belts 133, 135 also insure sharper definition of edges along the front faces of the blocks 4. The expulsion of moisture and ironing or smoothing of flaps 62, 66 is effected by the endless bands 141 which exchange heat with the heaters 143.

The output of my improved packaging apparatus is higher than the output of a conventional packaging machine. This is attributed to the fact that the belts 28, 30 or 128, 130 can advance the blocks 4 and U-shaped blanks 10' at a very high speed without any danger of excessive or uncontrolled deformation of blocks and/or blanks. The belts 28, 30 or 128, 130 need not be provided with motion transmitting projections, bars, plates, paddles or like auxiliaries which are utilized in presently known packaging machines to transport blocks of cigarettes through the packaging station. Moreover, and when the transfer member 22 or 122 fails to transfer a block 4 against the sheet 10 which is held in the guide 20 or 120, the sheet will remain in the guide until after the flaw is eliminated so that the sheets cannot contaminate the packaging station. The belts 28, 30 or 128, 130 grip the blanks 10' until after the open-ended envelopes 10'' are completed and sealed so that the tucking, folding, adhesive-applying and sealing actions can be performed while the blocks 4 retain their desired shape and while the belts 28, 30 or 128, 130 hold the major portions of the blanks against movement away from each other. As stated before, the suction chambers 36 or the backing plates 136 will provide supports for the inner stringers of the belts 28, 30 and 128, 130 during engagement of such stringers with the blanks. The pressure exerted by the inner stringers of the belts 28,

30 and 128, 130 against the adjoining panels of the blanks 10 suffices to prevent relative movements of cigarettes in the respective blocks 4. It was found that the apparatus of my invention will produce parallelepiped packs with a high degree of accuracy, i.e., each panel of the envelope 10'' will be of truly rectangular outline and will be bounded by sharp edges extending along all four sides of the front face and along all four edges between the top and lateral faces of a block 4.

The more important advantages of my method and apparatus can be summarized as follows: The transfer members 22 or 122 introduce the blocks 4 and U-shaped blanks 10' into the inlet of the channel 70 or 170 between the belts 28, 30 or 128, 130 at a speed which exceeds the speed of these belts. Therefore, the front, top and bottom panels of U-shaped blanks 10' are caused to lie snugly against the respective sides of the blocks without the formation of folds, corrugations and like unevennesses which could detract from the appearance of a finished pack. The inner stringers of the belts 28, 30 or 128, 130 preferably converge in a direction away from the inlet of the channel 70 or 170 so that the blanks 10' are properly held by friction during travel past the processing locations which accommodate the tucking, folding, sealing, heating and analogous units. The retention of blanks 10' against the adjacent surfaces of the belts 28, 30 or 128, 130 is assisted by suction. The endless bands 133, 135 can fold such parts of blanks which project laterally beyond the front faces of the blocks 4 with a high degree of accuracy and without causing any misalignment of blocks because their speed is the same as that of the belts 128, 130, i.e., only slightly less than the speed of the transfer member 122 when the latter performs a working stroke.

Many of the above outlined advantages are attributed to the fact that the blocks 4 and U-shaped blanks 10' are transported through the packaging station 5 or 105 by friction rather than by paddles, bars, plates or like entraining devices which are customary in many presently known packaging machines and are likely to subject the cigarettes and/or the blanks to excessive deformation.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features which fairly constitute essential characteristics of the generic and specific aspects of my contribution to the art.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. In a method of applying sheets around arrayed cigarettes or like block-shaped commodities wherein the commodities are moved seriatim against successive sheets to convert such sheets into substantially U-shaped blanks which are draped around the commodities prior to travel through a packaging station wherein the blanks advance past a series of processing locations, the improvement which comprises the steps of frictionally engaging the blanks at two opposite sides of the respective commodities immediately following conversion of said sheets into such blanks, continuously transporting the thus engaged blanks through the packaging station independently of the spacing between successive commodities which are delivered to said packaging station, and subjecting successive moving blanks to deforming operations at said processing locations independently of the spacing between successive blanks which are transported through said packaging station.

2. The improvement as defined in claim 1, wherein the blanks are engaged by a pair of surfaces travelling at the same speed.

3. The improvement as defined in claim 2, wherein the speed at which the commodities move with the blanks into said packaging station exceeds the speed of said surfaces.

4. In a method of applying sheets around arrayed cigarettes and like block-shaped commodities wherein the commodities are moved seriatim against successive sheets to convert such sheets into U-shaped blanks which are draped around the commodities prior to travel through a packaging station wherein the blanks advance past a series of processing locations, that improvement which comprises the steps of frictionally engaging the blanks at two opposite sides of the respective commodities by a pair of surfaces travelling at the same speed, attracting the blanks to said surfaces by suction, and transporting the thus engaged blanks through said packaging station.

5. The improvement as defined in claim 2, wherein said engaging step includes compressing the commodities between said surfaces.

6. Apparatus for applying sheets around arrayed cigarettes or like block-shaped commodities, comprising transporting conveyor means having two substantially parallel stringers defining between themselves an elongated channel having an inlet; drive means for continuously advancing said stringers in the same direction and at the same speed; transfer means for introducing a succession of commodities, each with a substantially U-shaped sheet-like blank draped therearound and immediately following the draping of said blanks around the respective commodities, through said inlet and into engagement with said stringers so that the stringers engage the blanks by friction at two opposite sides of the respective commodities and the thus engaged blanks are continuously transported by said stringers through said channel independently of the spacing between successive commodities; and a plurality of processing means adjacent to said channel for at least partially converting successive blanks into envelopes while such blanks are continuously transported by said stringers and independently of the spacing between successive blanks in said channel.

7. Apparatus as defined in claim 6, wherein said transfer means is arranged to introduce the commodities through said inlet at a speed which exceeds the speed of said stringers.

8. Apparatus for applying sheets around arrayed cigarettes or like block-shaped commodities, comprising transporting conveyor means having two substantially parallel stringers consisting of foraminous material and defining between themselves an elongated channel having an inlet; drive means for advancing said stringers in the same direction and at the same speed; transfer means for introducing a succession of commodities, each with a U-shaped sheet-like blank draped therearound, through said inlet and into engagement with said stringers so that the stringers engage the blanks by friction at two opposite sides of the respective commodities; means for attracting the blanks to said stringers by suction during travel of the respective commodities through said channel; and a plurality of processing means adjacent to said channel for converting successive blanks into box-shaped envelopes.

9. Apparatus as defined in claim 8, wherein said stringers consist of synthetic plastic material.

10. Apparatus as defined in claim 8, wherein said stringers consist of metallic material.

11. Apparatus as defined in claim 8, wherein said stringers consist of filamentary material.

12. Apparatus as defined in claim 6, further comprising feeder means for supplying sheets seriatim across the path of successive commodities upstream of said inlet, and means for converting the sheets into U-shaped blanks is the course of travel of the respective commodities with said transfer means.

13. Apparatus as defined in claim 6, wherein portions of said U-shaped blanks project laterally beyond said channel and wherein said processing means comprise tucking means laterally adjacent to said channel

for partially folding said projecting portions of blanks against the adjoining sides of the respectvie commodities.

14. Apparatus as defined in claim **13**, wherein said tucking means comprises a pair of endless belts having inner stringers adjacent to said channel and drive means for advancing said inner stringers at the speed of and in the same direction as said first mentioned stringers.

15. Apparatus as defined in claim **6**, wherein said stringers converge in a direction away from said inlet to subject the commodities to increasing compression during travel through said channel.

16. Apparatus as defined in claim **6**, wherein said stringers form part of two endless friction belts.

17. Apparatus as defined in claim **16**, wherein said stringers are disposed in two superimposed substantially horizontal planes and wherein said blanks are draped around the front, top and bottom sides of the respective commodities.

References Cited

UNITED STATES PATENTS

2,486,892	11/1949	Sumida	53—233
2,907,447	10/1959	Offutt et al.	
3,158,973	12/1964	Monaghan	53—233 X
3,191,356	6/1965	Zelnick et al.	53—182
3,327,449	6/1967	Hullhorst et al.	53—228 X
3,238,697	3/1966	Zucker	53—230
3,383,825	5/1968	Titchenal et al.	53—230 X

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U.S. Cl. X.R.

53—32, 124, 233; 198—165