(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 717 702 B1

(12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
16.12.1998 Bulletin 1998/51

(21) Application number: **94929242.9**

(22) Date of filing: **13.09.1994**

(51) Int. Cl.[6]: **B65B 35/50**, B65B 61/20

(86) International application number:
PCT/US94/10555

(87) International publication number:
WO 95/07840 (23.03.1995 Gazette 1995/13)

(54) METHOD OF FORMING STACKED ARTICLE GROUPS INTO PACKAGES

VERFAHREN ZUM BILDEN GESTAPELTER GRUPPEN VON GEGENSTÄNDEN IN VERPACKUNGEN

PROCEDE DE FORMATION DE GROUPES D'ARTICLES EMPILES DANS DES PAQUETS

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE

(30) Priority: **17.09.1993 US 123514**

(43) Date of publication of application:
26.06.1996 Bulletin 1996/26

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EP 0 717 702 B1

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention.

This invention relates to packaging methods and apparatus. Particularly, this invention relates to a method of forming stacked or multiple layer article groups outside packaging media, which utilizes a divider panel between top and bottom members of each group. The packaging method of the present invention is usable to package different types, styles and sizes of articles, in a wide range of stacked group patterns, and into a variety of packaging media, in a fast and reliable manner.

2. Background of the Invention.

In the past, various apparatus and processes have been proposed and utilized to package selected article groups. Prior art apparatus and processes have limited adjustability, limited output capability, and have been difficult to construct and utilize. And, no process or apparatus, insofar as is known, provides reliable high speed packaging of stacked or layered product groups.

Prior art packaging assemblies include U.S. Patent 4,802,324 to applicants' assignee for a Vertical Cartoning Assembly and Method which discloses the placement and assembly of cartons over pre-selected article groups being moved on a conveyor. U.S. Patent 5,036,644, also to applicants' assignee, discloses a Packaging Sleever Assembly which transfers flat packaging sleeves directly onto pre-selected article groups and subsequently wraps and closes the cartons. Various end loading packaging machines have also been proposed in the art. For example, U.S. Patent 3,778,959 to Langen et al. discloses an end loader which utilizes a plurality of transversely extending spaced apart fences or flights mounted on a conveyor to rake or capture a predetermined number of containers from infeed container slips. U.S. Patent 4,237,673 to Calvert et al. discloses a machine also for loading container sleeves through their open ends. U.S. Patent 4,936,077 to Langen et al. discloses a carton loading machine which utilizes pusher mechanisms with spring loaded pusher heads to stagger adjacent product group rows during transfer into the carton.

An improved method for continuously forming stacked article groups, including the step of longitudinally moving a first article group with respect to a second article group so as to form stacked article groups, is disclosed in WO-9420369A. (prior art in sense of Article 54 (3) EPC).

In view of the limitations and shortcomings of prior art processes and apparatus, it is an object of this invention to provide a method of reliably forming stacked product groups at high speed. Another object of this invention is to provide a packaging method which is usable with a variety of package types, articles and stacked group configurations and sizes. A particular object of the invention is to provide a method of forming stacked or multiple layer article groups outside of a packaging member, via a base member disposed between a lower article sub-group and an upper article sub-group.

SUMMARY OF THE INVENTION

The present invention provides a method forming stacked article groups as specified in claim 1.

Various embodiments of the basic method are disclosed, including continuous and intermittent methods, methods of group formation in a linear stream with article input from one or two sides, in aligned and staggered orientations, in-line methods, bi-level and single level input methods and side loading methods. The important aspect of each of the various embodiments of the basic method is that the stacked article group is formed outside of a packaging unit, and a divider or base support sheet is utilized.

In a preferred embodiment, the support base is constructed of paperboard and has a thin, substantially flat, rectilinear configuration with a surface area substantially coextensive with that of the top surface of the first article group. The completed stacked article groups are subsequently placed in a packaging unit such as a paperboard carrier. The method is ideally suited for beverage can packaging purposes.

The benefits of this invention will become clear from the following description by reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of one embodiment of the packaging assembly and method;

FIG. 2 is a side view of the packaging assembly shown in FIG. 1;

FIG. 3 is a crossectional view of the packaging assembly shown in FIG. 1;

FIG. 4 is a top view of an alternative embodiment of the packaging assembly and method;

FIG. 5 is a side view of the packaging assembly shown in FIG. 4;

FIG. 6 is a top view of an alternative embodiment of the packaging assembly and method;

FIG. 7 is a side view of the packaging assembly shown in FIG. 6;

FIG. 8 is a top view of an alternative embodiment of the packaging assembly and method;

FIG. 9 is a side view of the packaging assembly shown in FIG. 8;

FIG. 10 is a top view of an alternative embodiment of the packaging assembly and method;

FIG. 11 is a side view of the packaging assembly shown in FIG. 10;

FIG. 12 is a top view of an alternative embodiment of the packaging assembly and method;

FIG. 13 is a side view, partially in crossection, of the pusher face of the assembly shown in FIG. 12;

FIG. 14 is a side view of the packaging assembly shown in FIG. 12;

FIG. 15 is a top view of an alternative embodiment of the packaging assembly and method;

FIG. 16 is a side view of the packaging assembly shown in FIG. 15;

FIG. 17 is a perspective view of an exemplary stacked-type carton as constructed by the apparatus and method of the present invention;

FIG. 18 is a crossectional view of the carton and stacked article group shown in FIG. 17;

FIG. 19 is a top view of an embodiment of a cross loading or side loading mechanism used with the packaging assembly and with the method of the invention;

FIG. 20 is a side view of the mechanism shown in FIG. 19;

FIG. 21 is a top view of an alternative embodiment of the cross loading mechanism; and

FIG. 22 is a side view of the mechanism shown in FIG. 21.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The processes and apparatus form stacked article groups in a high speed packaging operation. As shown in the drawings, the method is implemented via a high-speed packaging apparatus . The apparatus is adjustable to provide reliable, continuous and high speed packaging of articles or products of varying types, sizes and quantities into packages of varying types and sizes. For example, the apparatus is usable to load standard twelve ounce beverage cans into 24(12/12), 30(15/15) and 36(18/18) pack stacked combinations. Moreover, the process of loading beverage containers into paperboard cartons, for example, is accomplished quickly and reliably, under typical industry tolerances for both container and carton construction. The resultant filled cartons output by the apparatus are of high quality and consistency, having maximized squareness and tautness for improved storage qualities and transportability. Although the embodiments disclosed load stacked can groups into paperboard cartons, its within the purview of this invention to process the stacked article groups in a variety of ways subsequent their formation, including side loading, shrink wrapping, banding or having paperboard or other material formed around them.

Referring to **FIGS. 1** and **2**, a first embodiment of the packaging assembly 10 generally comprises a carton supply and transport mechanism or stream 11, an article group selection and transport mechanism or stream 12, a pair of article supply mechanisms or streams 13 and 14, a divider placement mechanism 15, and an article group transfer or cross loading mechanism 16. These mechanisms are shown to be supported by a unitary frame structure 17, although if aligned properly, separate support structures may be utilized.

The carton supply mechanism 11 is shown to be disposed proximate an input end 18 of the assembly 10. Carton sleeves or blanks 25 are subsequently transported in a linear fashion to an output end 21 of the apparatus 10. The article supply mechanisms 13 and 14 are also shown to be disposed at the input end 20 of the apparatus 10. A first portion of each article supply mechanism 13 and 14 is disposed spatially parallel to the article group selection and transport mechanism 12, and a second portion merges, at a predetermined angle, with the article group selection transport mechanism 12 to supply streams of product or articles 20 to two separate positions along the article group selection and transport mechanism 12. These merging mechanisms 12-14 are further constructed and arranged to meter individual articles 20, via a fixed flight bar arrangement, into predetermined stacked article groups 21 and 22 on the mechanism 12.

The stacking function of the device 10 is accomplished by forming a first group 21 at a low level, placing a separator or divider sheet 24 on the lower group 21 via the divider sheet placement mechanism 15, and then simultaneously forming a second group 22 downstream at a higher level and allowing the upper group 22 to slide across the divider sheet 24 by the action of the flight bars 26 of the article group selecting mechanism 12. In an alternative embodiment, the second group may be formed on an upper dead plate and dropped or otherwise deposited onto the divider sheet.

The article group selection and transport mechanism 12 is disposed adjacent and parallel to the carton supply and transport mechanism 11 and extends downstream, in a linear orientation. Merged or combined article groups 23 are transported downstream thereon in a spaced and metered fashion, each group 23 being aligned with a carton 25 traveling on the carton supply and transport mechanism 11.

The cross loading or side loading mechanism 16 is disposed adjacent to and parallel with the second portion of the article group selection and transport mechanism 12, extending and traveling longitudinally with respect to the apparatus 10. The cross loading mechanism 16 has a plurality of loading arms which extend transversely or perpendicularly with respect to the transport mechanisms 11, 13 and 14, to move product groups 23 on the article group selection transport mechanism 12 into aligned cartons 25 traveling on the carton transport mechanism 11, thereby loading the cartons 25 with product groups 23.

Preferably, each of the aforementioned mechanisms 11-14 and 16 has a conveyor type structure with an endless chain or belt configured about rotatable drive and idler end means and moving longitudinally with respect to the input (upstream) and output (down-

stream) ends 18 and 19 of the apparatus 10. The movement of each mechanism is further synchronized with one another, for example by a common drive and/or gearing means.

FIGS. 4 and 5 show a second, alternative, embodiment of the method and assembly for forming a stacked article group. Basically, the assembly 35 inputs articles from the same side of the article group selection and transport stream or line and in an **aligned** orientation. In contrast, the previous embodiment showed article infeed from the same side of the selection and transport line, but in a **staggered** orientation.

The assembly 35 generally comprises a carton supply and transport mechanism or stream (not shown), an article group selection and transport mechanism or stream 36, a pair of article supply mechanisms or streams 38 and 39, and a divider placement mechanism 40. An article group transfer mechanism or some other form of carton loading or forming mechanism (not shown) is utilized to form carriers or some other form of packaging based on the stacked article groups formed by this mechanism 35. These elements are also preferably supported by a unitary frame structure (not shown), although if aligned properly, separate support structures may be utilized consistent with the teachings of this invention. Each of the aforementioned element also preferably has a conveyor type structure with an endless chain or belt configured about rotatable drive and idler end means and moving longitudinally with respect to the input (upstream) and output (downstream) ends of the apparatus 35. The movement of each mechanism is further preferably synchronized with one another, for example by a common drive and/or gearing means.

The article supply mechanisms 38 and 39 are shown to be disposed at the input end of the apparatus 35. A first portion of each article supply mechanism 38 and 39 is disposed spatially parallel to the article group selection and transport mechanism 36, and a second portion merges, at a predetermined angle, with the article group selection transport mechanism 36 to supply streams of product or articles at a single, aligned position, overhead with respect to each other, along the article group selection and transport mechanism 36. Alternatively, the lines 38 and 39 could angle directly into the selection and transport line 36. These merging mechanisms 36, 38 and 39 are further constructed and arranged to meter individual articles, via a fixed flight bar arrangement 37, into predetermined stacked article groups 42 and 43 on the mechanism 36.

The stacking function of the device 35 is accomplished by forming a first group 43 at a low level, placing a separator or divider sheet 44 on the lower group 43 via the divider sheet placement mechanism 40, and then simultaneously forming a second group 42 at a higher level and allowing the upper group 42 to slide across the divider sheet 44 by the action of the flight bars 37 of the article group selecting mechanism 36. In an alternative embodiment, the second group may be formed on an upper dead plate and dropped or otherwise deposited onto the divider sheet 44.

FIGS. 6 and 7 show a third embodiment of the method and assembly for forming a stacked article group. Basically, the assembly 52 inputs articles from **opposing sides** of the article group selection and transport stream and in a staggered orientation. In contrast, the two preceding embodiments showed article input from the **same side** of the group selection and transport mechanism.

The assembly 52 generally comprises a carton supply and transport mechanism or stream (not shown), an article group selection and transport mechanism or stream 53, a pair of article supply mechanisms or streams 55 and 56, and a divider placement mechanism 57. An article group transfer mechanism or some other form of carton loading or forming mechanism (not shown) is utilized to form carriers or some other form of packaging based on the stacked article groups formed by this mechanism 52. These elements are also preferably supported by a unitary frame structure (not shown), although if aligned properly, separate support structures may be utilized consistent with the teachings of this invention. Each of the aforementioned element also preferably has a conveyor type structure with an endless chain or belt configured about rotatable drive and idler end means and moving longitudinally with respect to the input (upstream) and output (downstream) ends of the apparatus 52. The movement of each mechanism is further preferably synchronized with one another, for example by a common drive and/or gearing means.

The article supply mechanisms 55 and 56 are preferably disposed at the input end of the apparatus 52, and on opposing sides of the selection and transport line 53. A first portion of each article supply mechanism 55 and 56 is disposed spatially parallel to the article group selection and transport mechanism 36, and a second portion merges, at a predetermined angle, with the article group selection transport mechanism 53 to supply streams of product or articles at two distinct, staggered positions along the article group selection and transport mechanism 53. These merging mechanisms 55, 56 and 53 are further constructed and arranged to meter individual articles, via a fixed flight bar arrangement 54, into predetermined stacked article groups 59 and 58 on the mechanism 52.

The stacking function of the device 52 is accomplished by forming a first group 59 at a low level, placing a separator or divider sheet 60 on the lower group 59 via the divider sheet placement mechanism 57, and then forming a second group 58 at a higher level downstream and allowing the upper group 58 to slide across the divider sheet 60 by the action of the flight bars 54 of the article group selecting mechanism 53.

Referring to **FIGS. 8 and 9**, a portion of a fourth embodiment of the stacked article cartoning apparatus 66 is shown wherein upper article sub-groups 67 are deposited on the top surface of divider sheet 68 on

lower article sub-group 69 to form a stacked article group 70. In this embodiment, an upper stream 71 of article sub-groups 67 is disposed above and in longitudinal alignment with a lower stream 72 of article sub-groups 69. The upper stream 71 is shown to include a dead plate 73 across which the upper article sub-groups 67 are moved by the action of upper pusher bars 74. The lower stream 72 includes a conveyor 75 and flight bars 76. As shown, the upper article sub-groups 67 are dropped directly, vertically on top of the divider sheet 68 as they move over the terminal edge 77 of the dead plate. Longitudinal movement of the upper and lower article sub-groups 67 and 69 is synchronized.

FIGS. 10 and 11 show a fifth embodiment of the method and assembly for forming a stacked article group. Basically, the assembly 83 inputs articles from the same side of the article group selection and transport stream, in a staggered orientation. Importantly, the article input lines are disposed at the **same vertical level or plane**, while the article group selection and transport line level is **vertically indexed** to perform the stacking function. In contrast, the preceding embodiments showed article input at **two different vertical levels onto a single and constant level** selection and transport line.

The assembly 83 generally comprises a carton supply and transport mechanism or stream (not shown), an article group selection and transport mechanism or stream 84, a pair of article supply mechanisms or streams 88 and 89, and a divider placement mechanism 92. An article group transfer mechanism or some other form of carton loading or forming mechanism (not shown) is utilized to form carriers or some other form of packaging based on the stacked article groups formed by this mechanism 83. These elements are also preferably supported by a unitary frame structure (not shown). Each of the aforementioned elements also preferably has a synchronized conveyor type structure with an endless chain or belt configured about rotatable drive and idler end means and moving longitudinally with respect to the input (upstream) and output (downstream) ends of the apparatus 83.

The article supply mechanisms 88 and 89 are shown to be disposed on the same side of the selection and transport line 84, although they may be located on opposing sides as discussed above. Additionally, input is shown in a staggered orientation at distinct points along the longitudinal stream of the selection and transport line 84, although input may be made in an aligned fashion, also as discussed above. These merging mechanisms 84, 88 and 89 are constructed and arranged to meter individual articles, via a fixed flight bar arrangement 87 having upper and lower bars which are shown to be coupled to a separate conveyor 86, into predetermined stacked article groups 90 and 91 on the mechanism 83.

The stacking function of the device 83 is accomplished by forming the first group 90, placing a separator or divider sheet 93 on group 90 via the divider sheet placement mechanism 92, lowering the position of the group 90 as it moves downstream, and then forming a second group 91 at the same vertical level as that at which the first group 90 was formed, downstream, and allowing the second group 91 to slide across the divider sheet 93 by the action of the flight bars 87 of the article group selecting mechanism 84. Importantly, the article group selection and transport mechanism 84 is a lowerator-type mechanism which varies the vertical level of each base platform 85 as it moves downstream, and thus the position of its corresponding transported article group 90. The flight bars 87 are shown to move at a constant level, in synchronization with the lowerator platforms 85. In this orientation, the lower bar functions to select and meter articles, while the upper bar primarily functions to stabilize the formed stacked group.

FIGS. 12-14 show a sixth embodiment of the method and assembly for forming a stacked article group. The assembly 99 is an **intermittent** system, in contrast to the **continuous** systems discussed above, which loads cartons with stacked article groups formed outside of the package into cartons from the side. The assembly 99 generally comprises a carton set-up line 100, a carton placer 101, a low infeed line 104, a high infeed line 107 a divider placer 110 and a pusher mechanism 111..

Cartons 103 are placed from the carton placer 101, preferably a rotary-type placer, onto the carton set-up conveyor 100, each between conveyor lugs 102, for longitudinal downstream transport. The low infeed line 104 is disposed adjacent the carton set-up line 100 and comprises a conveyor 105 with spaced flight bars 106, between which the low article groups 114 are disposed. The low infeed line 104 is disposed at the same level or plane as that of the carton set-up line 100. The high infeed line 107 is disposed adjacent the low infeed line 104 and comprises a conveyor 108 with spaced flight bars 109 between which high groups 115 are disposed. The high infeed line 107 is disposed at a higher level than that of the low infeed line 104 and carton set-up line 100. The low and high groups 114 and 115 may be placed between the flight bars 106 and 109 respectively, by an upstream selection action as described above, or by other means known in the art.

The flight bars 106 and 109 are shown to be aligned with the lugs 102 of the carton set-up line 100, and the respective conveyors of the carton set-up line 100, low infeed line 104 and high infeed line 107 are synchronized with each other so that the pusher mechanism 111 can laterally move across each line 107 and 104 pushing the article groups 114 and 115 thereon into cartons 103. As the pusher mechanism 111 contacts the high group 115, the divider placer 110 deposits a divider 117 onto the top of the low group 114. The pusher mechanism 111 then moves the high group 115 off of conveyor 108 and across the top surface of the divider sheet 117 to form a stacked article group 116, which is

then side loaded into the carton 103 by continued action of the pusher mechanism 111. The reciprocating pusher mechanism 111 comprises a slotted or bifurcated loading face 112 and a loading arm 113 that can pass across the two lines 107 and 104.

FIGS. 15 and 16 show a seventh embodiment of the method and assembly for forming a stacked article group. The assembly 123 is also an **intermittent** system which loads cartons with stacked article groups formed outside of the package into cartons from the side. The assembly 123 generally comprises a carton set-up line 124, a carton placer 125, a low infeed line 128, a high infeed line 131 a divider placer 134 and a pair of pusher mechanisms 135 and 136.

Cartons 127 are placed from the carton placer 125, preferably a rotary-type placer, onto the carton set-up conveyor 124, each between conveyor lugs 126, for longitudinal downstream transport. The low infeed line 128 is disposed adjacent the carton set-up line 124 and comprises a conveyor 129 with spaced flight bars 130, between which the low article groups 137 are disposed. The low infeed line 128 is disposed at the same level or plane as that of the carton set-up line 124. The high infeed line 131 is disposed adjacent the low infeed line 128 and comprises a conveyor 132 with spaced flight bars 133 between which high groups 138 are disposed. The high infeed line 131 is disposed at a higher level than that of the low infeed line 128 and carton set-up line 124. The low and high groups 137 and 138 may be placed between the flight bars 130 and 132 respectively, by an upstream selection action as described above, or by other means known in the art.

The flight bars 130 and 132 are shown to be aligned with the lugs 126 of the carton set-up line 124, and the respective conveyors of the carton set-up line 124, low infeed line 128 and high infeed line 131 are synchronized with each other so that the first pusher mechanism 135 can move across each line 131 and 128 pushing the article groups 138 and 137 thereon into cartons 127. As the first pusher mechanism 135 contacts the high group 138, the divider placer 134 deposits a divider 140 onto the top of the low group 137. The pusher mechanism 135 then moves the high group 138 off of conveyor 132 and across the top surface of the divider sheet 140 to form a stacked article group 139, which is then moved downstream on conveyor 129 and aligned with the second pusher mechanism 136. The stacked group 139 is then side loaded into the carton 127 by the lateral action of the second pusher mechanism 136. Both reciprocating pusher mechanisms 135 and 136 comprise a substantially flat, unitary loading face connected to an elongated loading arm.

Referring to **FIGS. 17** and **18**, the method is usable to construct carriers or cartons 146 containing articles 147 which are layered on top of one another or stacked, as shown by way of example. The paperboard carrier blank or sleeve 146 is comprised of leading and trailing side panels 148 foldably connected to top panel 150 and to a bottom panel 151. End panels 152 connect the top, bottom and side panels 150, 151 and 148. Various alternative end panel structures may be processed by the method and assembly of this invention. As shown, the carrier 146 contains a bottom layer or sub-group 153 of articles, shown for purpose of illustration as beverage cans 147, and an upper layer or sub-group 154 of cans in stacked relationship. The lower ends of the upper cans 154 are supported on a thin, paperboard divider sheet 155 (also referred to as a base or support sheet) with the bottom cans 153 resting on the bottom panel 151. The top panel 150 is disposed closely adjacent, and preferably is in contact with, the top chimes of the upper level 154 of cans to provide for a tight fit between the cans 147 and the carrier 146.

FIGS. 19 and 20 show an embodiment of a cross loading or side loading mechanism 161 which is usable with the assemblies discussed above and with the method of the invention. The cross loading mechanism 161 is shown in use with a carton transport line 162 and an article group transport line 163, transporting cartons 165 and stacked article groups 166, respectively. The side loading mechanism 161 generally comprises three pully/shaft assemblies 167a,b,c, at least one drive chain or belt 168 connected to the assemblies 167, and a plurality of loader heads 169 connected to the chain 168. The mechanism 161 is shown to have a sloping face wherein the loader heads 169 approach the article group transport mechanism 163 at an angle. The loader heads 169 are further aligned with the article groups 166 and the cartons 165 such that as the heads 169 angle inwardly, they continuously contact the article groups 166 and move them across the line 163 and into the aligned and synchronized cartons 165. Importantly, the loader heads 169 have a predetermined height such that they contact and support the tall side face of the stacked article group 166.

FIGS. 21 and 22 show an alternative embodiment of a cross loading or side loading mechanism 175 which is usable with the assemblies discussed above. The cross loading mechanism 175 is shown in use with a carton transport line 176 and an article group transport line 177, transporting cartons 180 and stacked article groups 181, respectively. The side loading mechanism 175 generally comprises a lower member 178 and an upper member 179. The lower member 178 includes a conveyor 182 which is disposed adjacent the article group transport line 177 and a plurality of flight bars 183 connected to the conveyor 182 which contact a lower portion of each stacked article group 181. The upper member 179 is disposed directly over head relative to the lower member 178 and includes a conveyor 185 and a plurality of flight bars 186 which contact an upper portion of each stacked article group 181. The mechanism 175 further comprises a pair of guide rails 184 which have a predetermined configuration and are disposed at a vertical level which is between the flights 183 and 186. Further, the guide rails 184 are disposed a predeter-

mined distance apart to accommodate the dimensions of an article group 181, and angle towards the carton transport line 176. The conveyors 182 and 185 are synchronized and the flights 183 and 186 are aligned so that the top and bottom portions of the stacked article group 181 are stabilized and moved along an identical travel path for side loading into the cartons 180.

Although the apparatus shown in the drawings are utilized in a beverage can cartoning operation with paperboard carrier sleeves, modifications may be made to package various other stacked containers or articles, in various carrier configurations, or to package the article groups via shrink wrapping, banding or the like. As many changes are possible to the embodiments, the descriptions above, and the accompanying drawings should be interpreted in the illustrative and not the limited sense.

Claims

1. A continuous method of forming complete stacked article groups into packages, comprising the steps of:

   (a) supplying at least two streams of articles;
   (b) forming lower article sub-groups having a plurality of articles;
   (c) placing a support base on a top surface of each lower article sub-group;
   (d) forming an upper article sub-group, having a plurality of articles on top of said support base of each lower article sub-group by slidingly moving articles across said support base, said sliding formation of said upper article sub-group simultaneously forming said complete stacked article group; and characterized by
   (e) undertaking a loading step by means of a loading mechanism having a moving sloped face, movement of which loads said stacked article group into packages.

2. The method of Claim 1, wherein said support base has a thin, substantially flat, rectilinear configuration with a surface area substantially coextensive with that of the top surface of said first article group.

3. The method of claim 2, wherein said support base is constructed of paperboard.

4. The method of claim 1, comprising the step of placing said stacked article groups in cartons.

5. The method of claim 1, wherein two article streams are supplied, and wherein each said article stream is further segregated into at least two rectilinear article lanes, and wherein said article lanes intersect a longitudinal stream at a predetermined angle and wherein said first and second article groups are formed and transported in said longitudinal stream by being raked from said article lanes.

6. The method of Claim 5, wherein said article streams are disposed at vertically separate and distinct horizontal planes.

7. The method of Claim 5, wherein said article streams are disposed in the same horizontal plane.

8. The method of Claim 5, wherein a first said article stream is supplied at a first longitudinal position in said longitudinal stream, and a second said article stream being supplied at a second, distinct longitudinal position in said longitudinal stream, said first article group being formed at said first position, said second article group being formed at said second position, and said support base being placed at a position between said first and said second positions.

9. The method of Claim 8, wherein said first article stream is further supplied at a first lateral side and said second article stream is supplied at a second lateral side.

10. The method of Claim 8, wherein said first and second article streams are supplied at a first lateral side.

11. The method of Claim 5, wherein a first article stream is supplied at a first longitudinal position, and a second article stream also being supplied said first longitudinal position, said first and second article groups being formed at said first position, and said support base being placed at said first position.

Patentansprüche

1. Kontinuierliches Verfahren zum Bilden vollständiger gestapelter Artikelgruppen in Verpackungen, mit den Schritten:

   a) Zuführen von wenigstens zwei Strömen von Artikeln;

   b) Bilden von unteren Artikeluntergruppen mit mehreren Artikeln;

   c) Plazieren einer Unterstützungsgrundlage auf einer oberen Oberfläche einer jeden Artikeluntergruppe;

   d) Bilden einer oberen Artikeluntergruppe mit mehreren Artikeln auf der Oberseite der Unterstützungsgrundlage einer jeden unteren Artikeluntergruppe, durch gleitendes Bewegen von

Artikeln über die Unterstützungsgrundlage, wobei die gleitende Bildung der oberen Artikeluntergruppen gleichzeitig die vollständig gestapelte Artikelgruppe bildet, und gekennzeichnet durch

e) Unternehmen eines Ladeschrittes mittels eines Lademechanismus mit einer bewegenden ansteigenden Fläche, deren Bewegung die gestapelten Artikelgruppen in Verpackungen einlädt.

2. Verfahren nach Anspruch 1, in welchem die Unterstützungsgrundlage eine dünne, im wesentlichen flache, rechteckige Konfiguration mit einer Oberfläche von im wesentlichen gleicher Erstreckung mit derjenigen der oberen Oberfläche der ersten Artikelgruppe hat.

3. Verfahren nach Anspruch 2, in welchem die Unterstützungsgrundlage aus Pappe gebildet ist.

4. Verfahren nach Anspruch 1, enthaltend den Schritt des Plazierens der gestapelten Artikelgruppen in Kartons.

5. Verfahren nach Anspruch 1, in welchem zwei Ströme von Artikeln zugeführt werden, und in welchem jeder Strom von Artikeln außerdem in wenigstens zwei rechtwinklige Reihen von Artikeln unterteilt ist, und in welchem die Reihen von Artikeln den longitudinalen Strom in einem vorbestimmten Winkel schneiden und in welchem die ersten und zweiten Artikelgruppen gebildet und in den longitudinalen Strom durch Herausziehen aus den Reihen von Artikeln transportiert werden.

6. Verfahren nach Anspruch 5, in welchem die Ströme von Artikeln in vertikal getrennten und gesonderten horizontalen Ebenen angeordnet sind.

7. Verfahren nach Anspruch 5, in welchem die Ströme von Artikeln in der gleichen horizontalen Ebene angeordnet sind.

8. Verfahren nach Anspruch 5, in welchem ein erster Strom von Artikeln in einer ersten Längsposition in den longitudinalen Strom zugeführt wird, und ein zweiter Strom von Artikeln in einer zweiten, gesonderten Längsposition in den longitudinalen Strom zugeführt wird, wobei die erste Artikelgruppe an der ersten Position gebildet wird und die zweite Artikelgruppe an der zweiten Position gebildet wird und die Unterstützungsgrundlage an einer Position zwischen der ersten und der zweiten Position plaziert wird.

9. Verfahren nach Anspruch 8, in welchem der erste Strom von Artikeln außerdem von einer ersten seitlichen Seite und der zweite Strom von Artikeln von einer zweiten seitlichen Seite zugeführt wird.

10. Verfahren nach Anspruch 8, in welchem die ersten und zweiten Ströme von Artikeln von einer ersten seitlichen Seite zugeführt werden.

11. Verfahren nach Anspruch 5, in welchem ein erster Strom von Artikeln in einer ersten Längsposition und ein zweiter Strom von Artikeln auch an dieser ersten Längsposition zugeführt wird, wobei die ersten und zweiten Artikelgruppen an der ersten Position gebildet werden, und die Unterstützungsgrundlage an der ersten Position gebildet wird.

Revendications

1. Procédé de formation de groupes d'articles empilés dans des emballages, comprenant les étapes de:

a) formation d'au moins deux flux d'articles;
b) formation de sous-groupes d'articles inférieurs comprenant une pluralité d'articles;
c) mise en place d'une base support sur la face supérieure de chaque sous-groupe d'articles inférieur;
d) formation d'un sous-groupe d'articles supérieur, comprenant une pluralité d'articles, au-dessus de ladite base support de chaque sous-groupe d'articles inférieur en faisant glisser les articles sur ladite base support, ladite formation par glissement dudit sous-groupe d'articles supérieur formant simultanément ledit groupe d'articles empilés complet, caractérisé par:
e) la mise en oeuvre d'une étape de chargement au moyen d'un mécanisme de chargement présentant une face mobile inclinée dont le mouvement charge ledit groupe d'articles empilé dans lesdits emballages.

2. Procédé selon la revendication 1, dans lequel ladite base support est d'une configuration linéaire sensiblement plate et mince présentant une face de dimensions sensiblement identiques à celles de la face supérieure dudit premier groupe d'articles.

3. Procédé selon la revendication 2, dans lequel ladite base support est réalisée en carton.

4. Procédé selon la revendication 1, comprenant l'étape de mise en place desdits groupes d'articles empilés dans des cartons.

5. Procédé selon la revendication 1, dans lequel deux flux d'articles sont formés, dans lequel chacun desdits flux d'articles est divisé en au moins deux lignes d'articles rectilignes, dans lequel lesdites lignes d'articles coupent un flux longitudinal suivant un angle prédéterminé et dans lequel lesdits premier et second groupes d'articles sont formés et transportés dans ledit flux longitudinal en étant canalisés à partir desdites lignes d'articles.

6. Procédé selon la revendication 5, dans lequel lesdits flux d'articles sont disposés dans des plans horizontaux séparés verticalement et distincts.

7. Procédé selon la revendication 5, dans lequel lesdits flux d'articles sont disposés dans le même plan horizontal.

8. Procédé selon la revendication 5, dans lequel un premier desdits flux d'articles alimente, en un premier emplacement longitudinal, ledit flux longitudinal, et un second desdits flux d'articles alimente, en un second emplacement longitudinalement distinct, ledit flux longitudinal, ledit premier groupe d'articles étant formé audit premier emplacement, ledit second groupe d'articles étant formé audit second emplacement, et ladite base support étant placée entre lesdits premier et second emplacements.

9. Procédé selon la revendication 8, dans lequel ledit premier flux d'articles alimente, en outre, un premier flanc et ledit second flux d'articles alimente un second flanc.

10. Procédé selon la revendication 8, dans lequel lesdits premier et second flux d'articles alimentent un même flanc.

11. Procédé selon la revendication 5, dans lequel un premier flux d'articles alimente un premier emplacement longitudinal, et un second flux d'articles alimente aussi ledit premier emplacement longitudinal, lesdits premier et second groupes d'articles étant formés audit premier emplacement, et ladite base support étant placée audit premier emplacement.

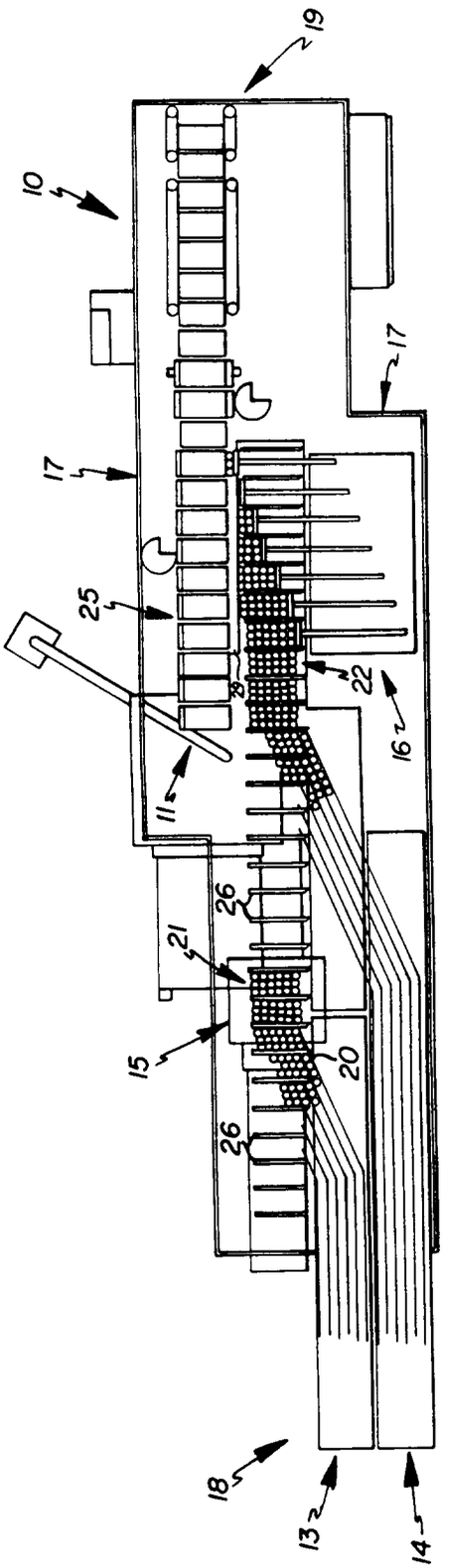
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Fig. 1

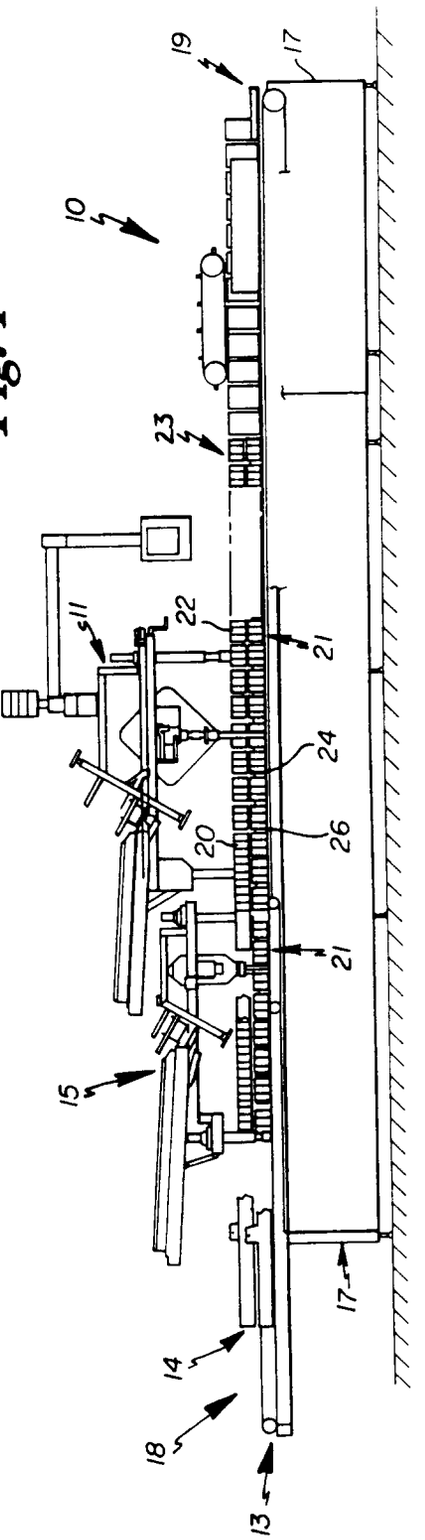
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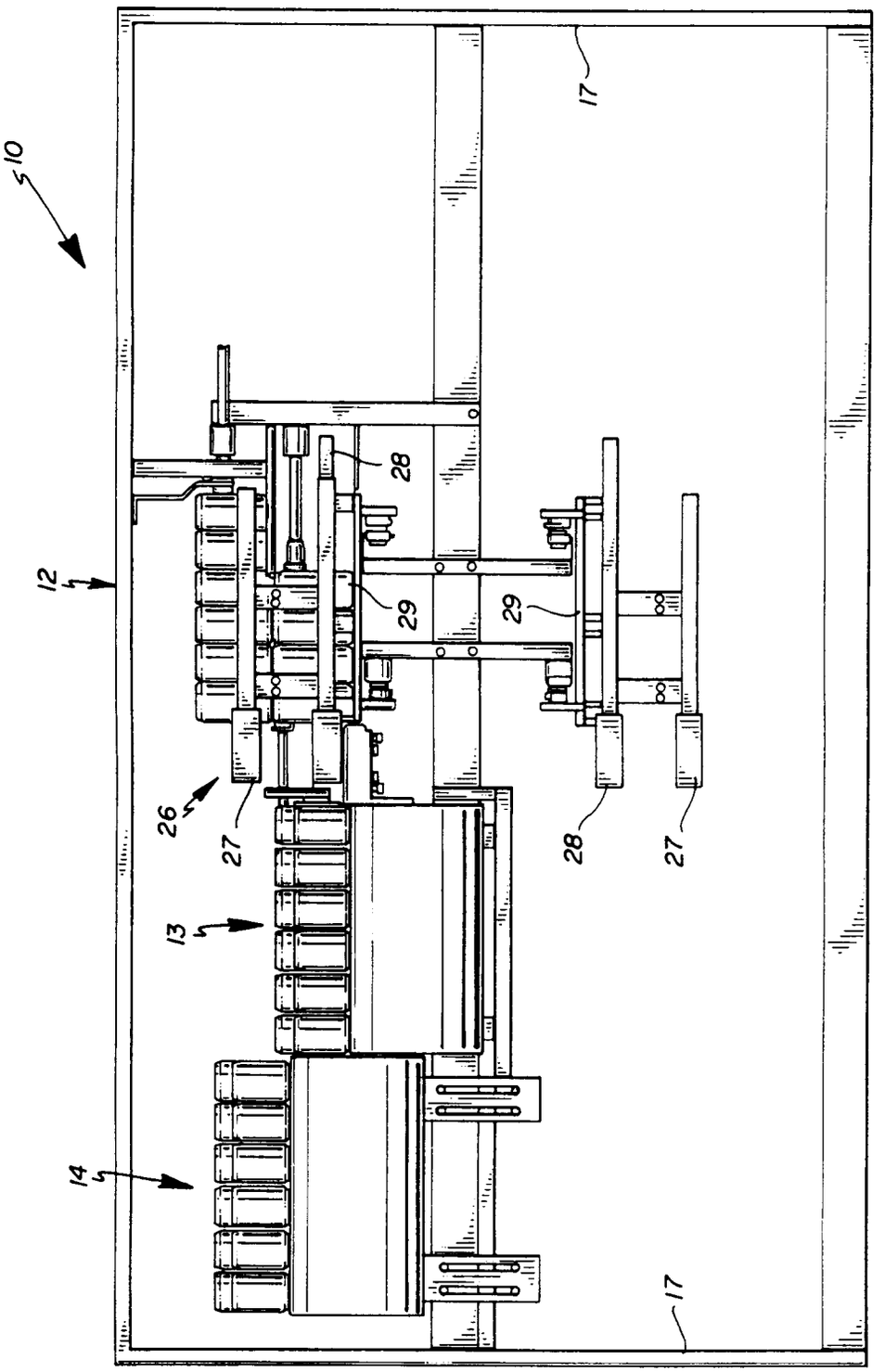
Fig. 2



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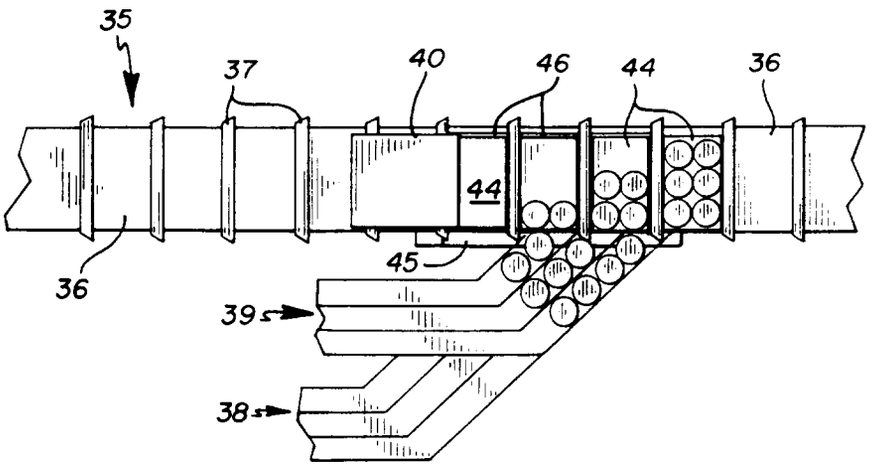

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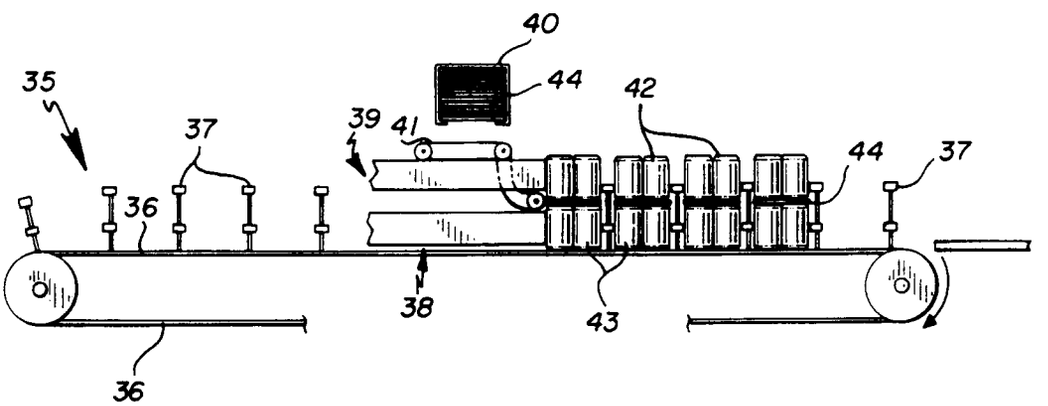

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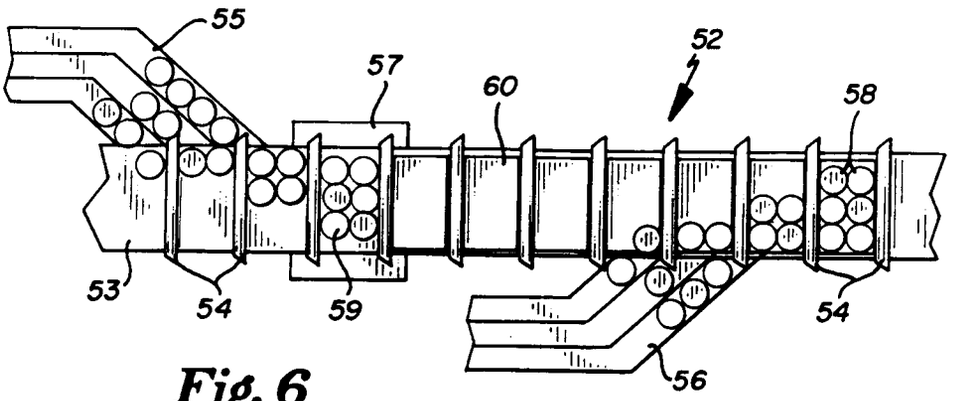

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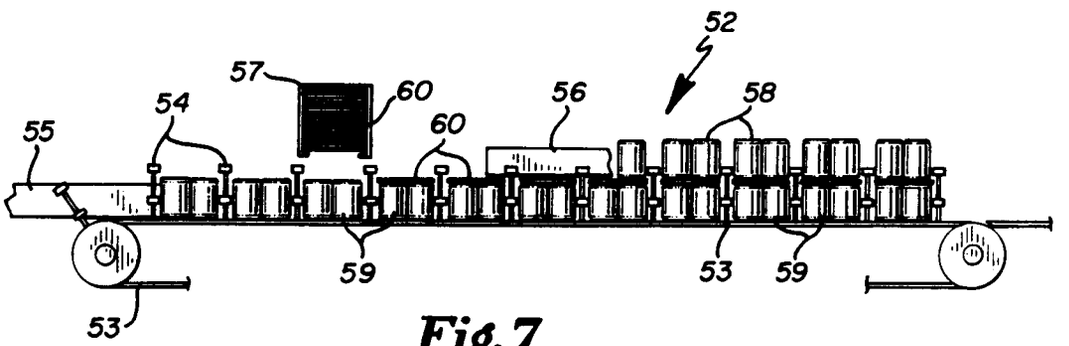

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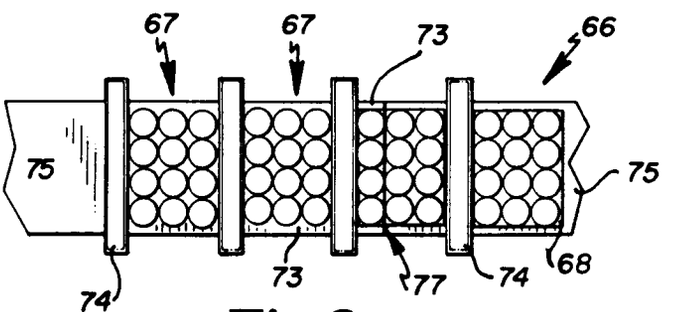

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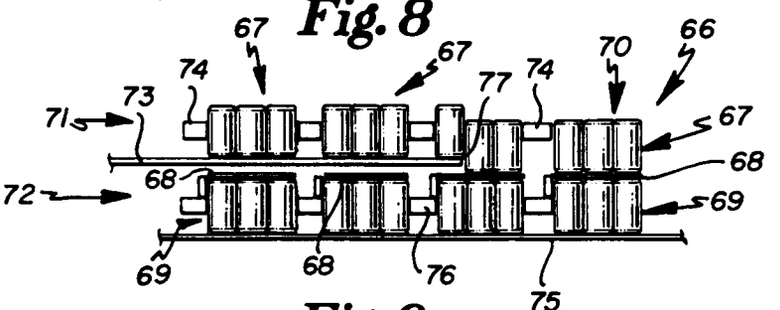

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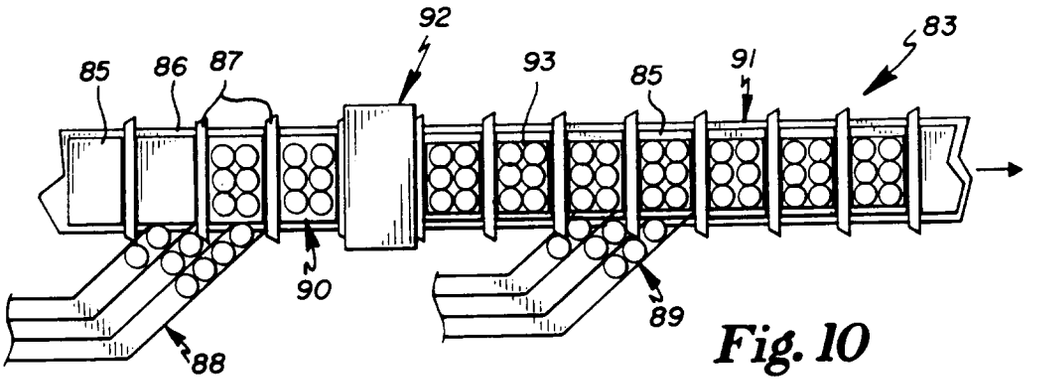

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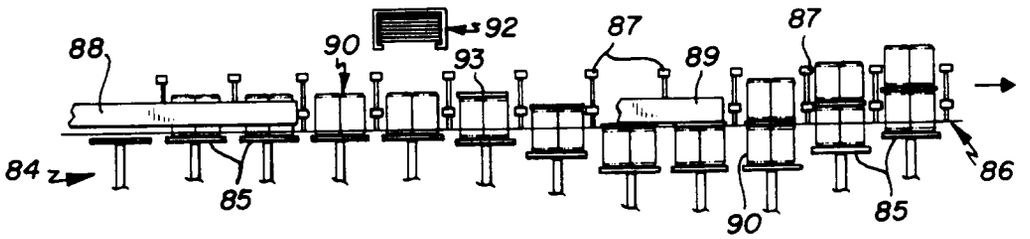

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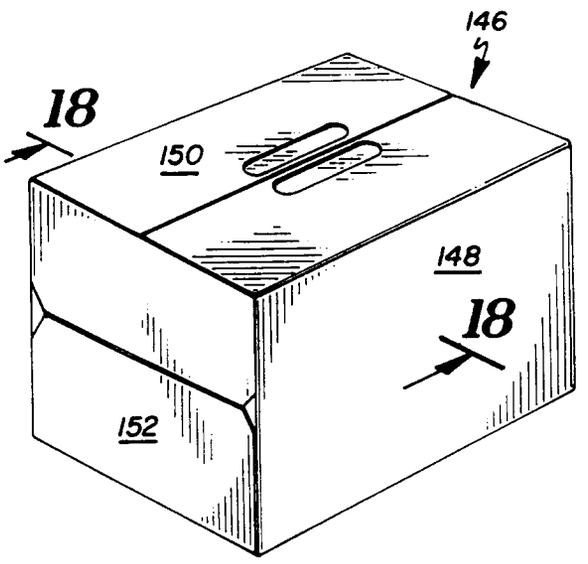

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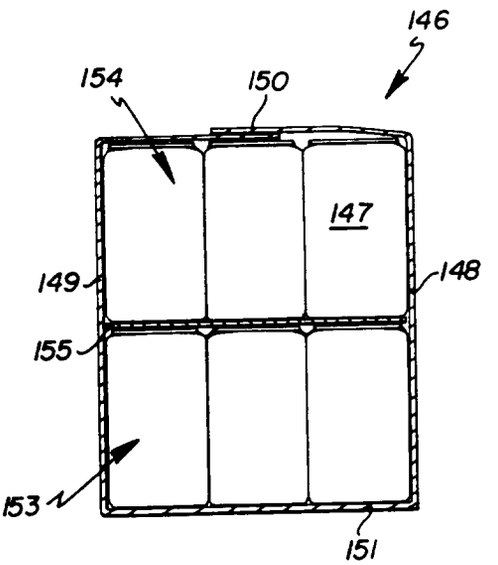

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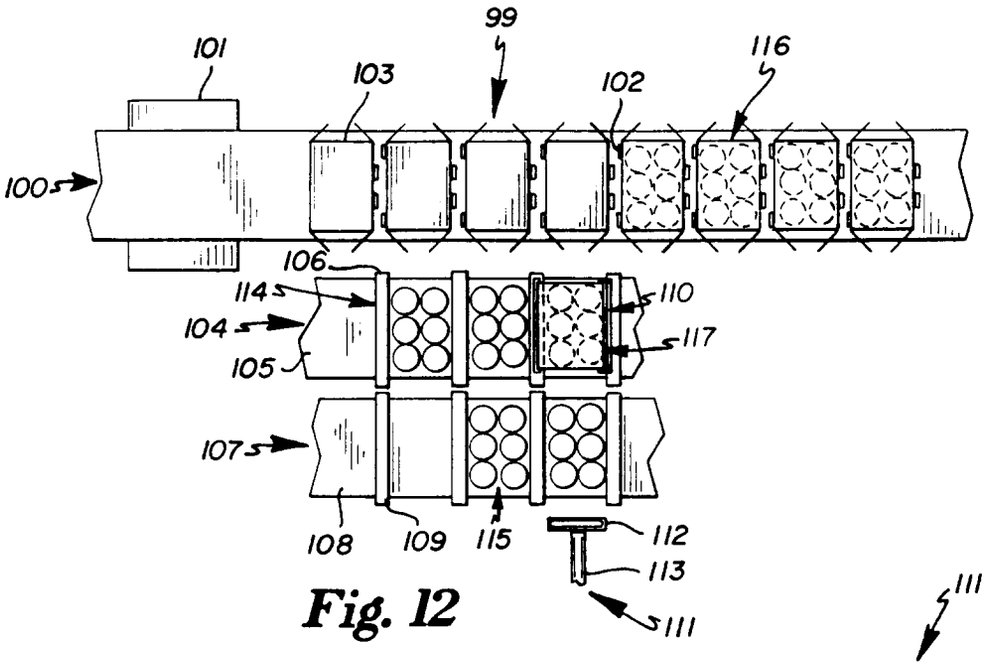

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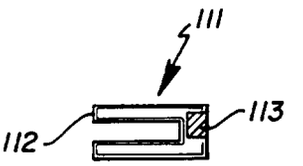

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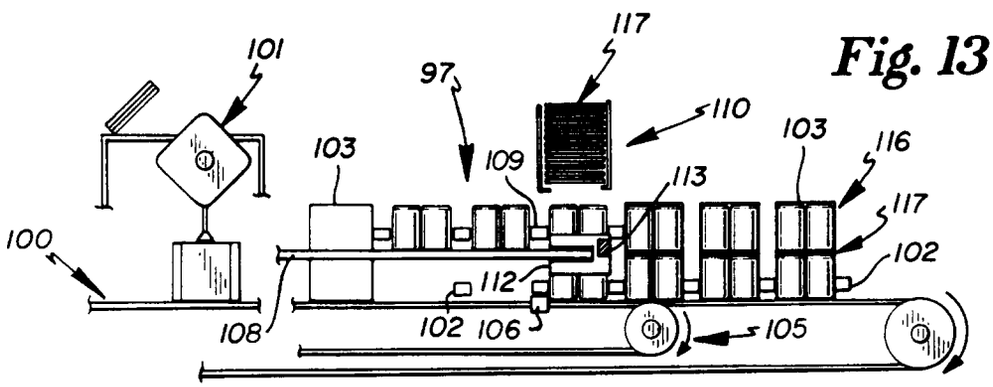

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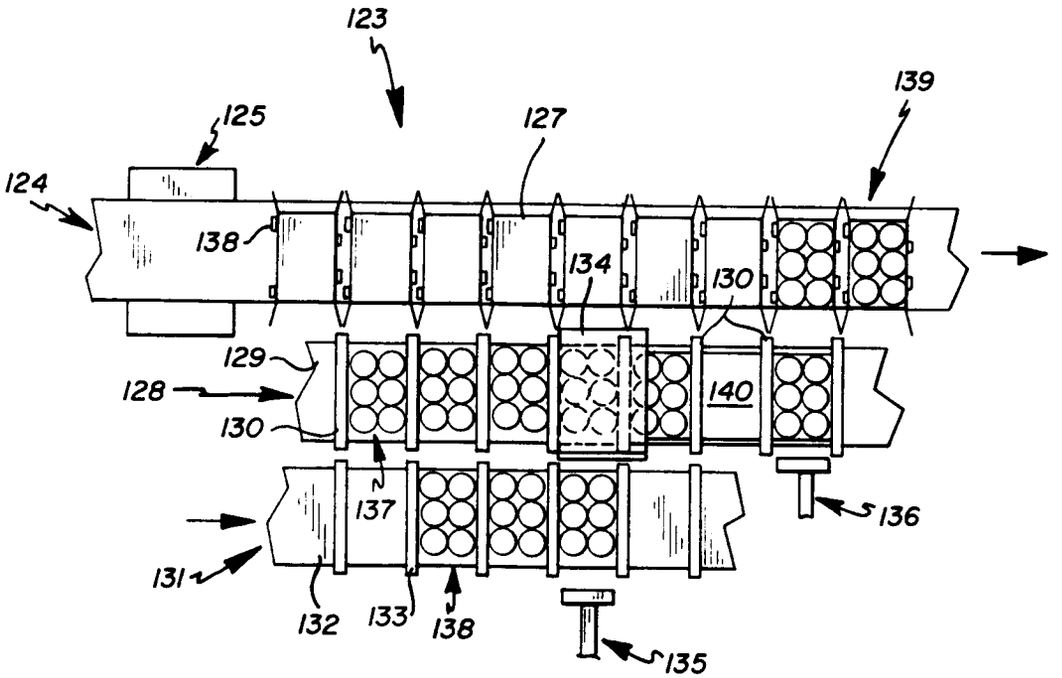
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Fig. 15

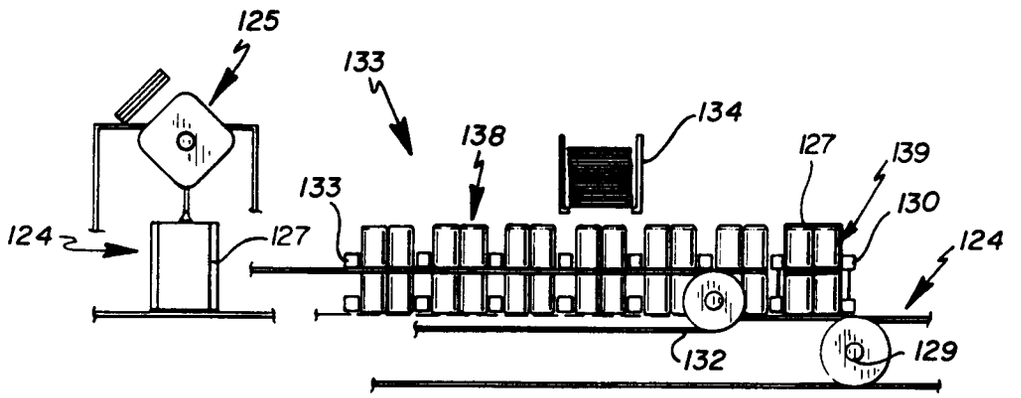
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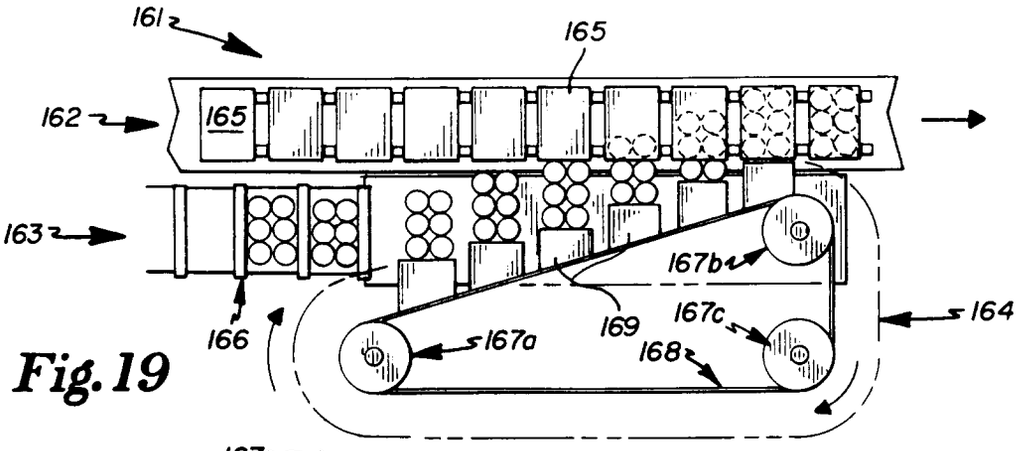
Fig. 16



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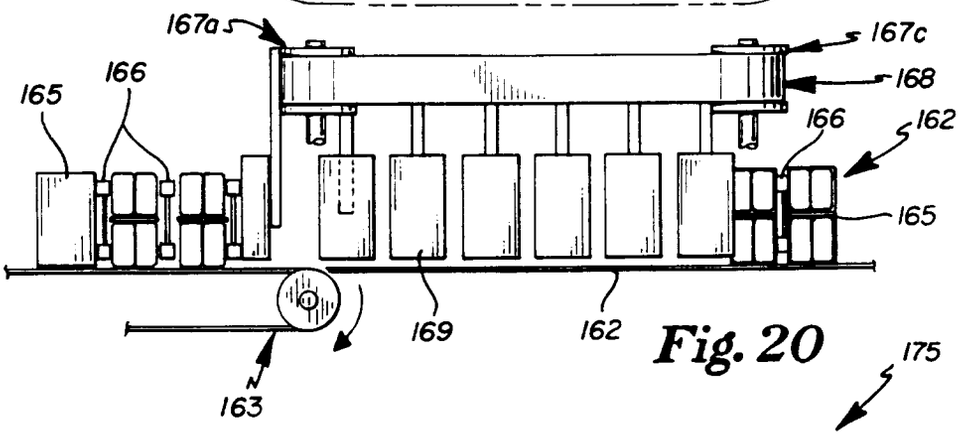

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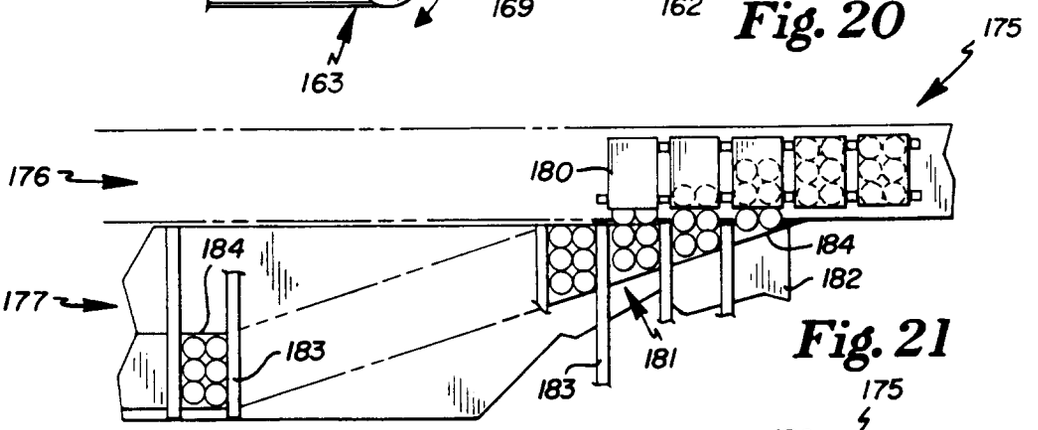

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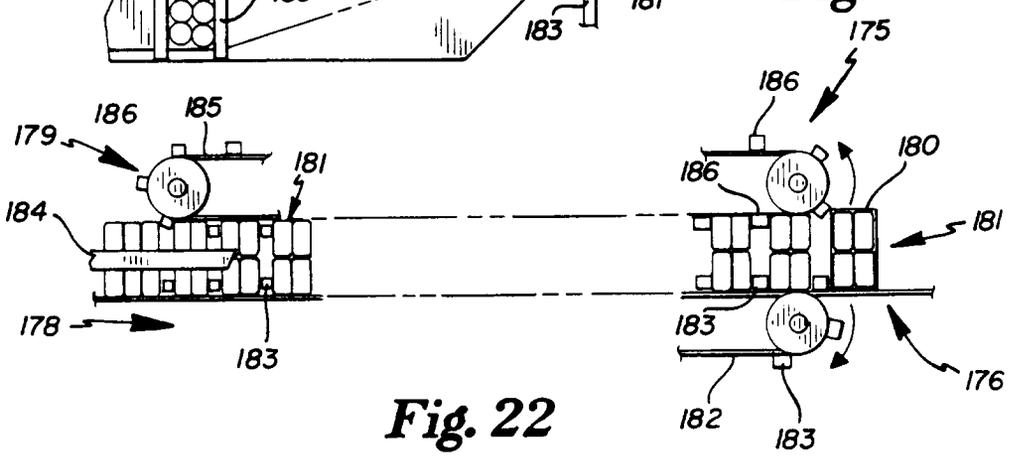

Fig. 22