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(54) CROSS LOADING APPARATUS FOR USE WITH CARTONING SYSTEMS

BESCHICKUNGSVORRICHTUNG ZUR VERWENDUNG IN KARTONIEREINRICHTUNGEN

APPAREIL DE CHARGEMENT CROISE DESTINE A ETRE UTILISE AVEC DES SYSTEMES D'ENCARTONNAGE

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(73) Proprietor: **RIVERWOOD INTERNATIONAL CORPORATION**
Denver, CO 80202 (US)

(72) Inventors:
- **ZIEGLER, Kelly, W.**
  Crosby, MN 56441 (US)
- **ALEXSON, Clayton, C.**
  Nisswa, MN 56468 (US)
- **LOVOLD, Curt, W.**
  Warroad, MN 56763 (US)

(74) Representative: **Powell, Stephen David et al**
WILLIAMS, POWELL & ASSOCIATES
34 Tavistock Street
London WC2E 7PB (GB)

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EP 0 632 776 B1

Description

BACKGROUND OF THE INVENTION

This invention relates to apparatus and methods used in the packaging industry. Particularly, this invention relates to an article group transfer mechanism for use in continuous motion cartoner assemblies which load article groups into cartons or packages. The article group transfer mechanism is a side or crossloading-type device. The apparatus of this invention enables the loading of different types, styles and sizes of articles, such as cans and bottles, and a wide range of article group patterns, both stacked and unstacked, into paperboard or other cartons in a fast and reliable manner.

In the past, various machines and processes have been proposed and utilized to package selected article groups into cartons by loading such article groups from the side or sides of the carton. Each prior art machine and process, however, accomplishes the packaging of the article groups in a distinct manner and utilizes particular structure. Moreover, prior art devices have limited adjustability, limited output capability, and have been difficult to construct and maintain due to their respective designs.

In view of the limitations and shortcomings of prior art methods and apparatus, it is an object of this invention to provide an apparatus which continuously and reliably cartons predetermined product groups at high speed. Another object of this invention is to provide a continuous motion cartoner which is adjustable for use with a variety of cartons, articles and article group types and sizes. A further object of the invention is to provide article group transfer structures which enable an article group to be moved and controlled with a positive force so that the article group may be tightly placed and maintained in a carton. Another object of the invention is to provide article group transfer structures having transversely reciprocating arm assemblies including cam actuated stepped transfer heads for loading product groups in an initially nested configuration having a differentially thinner loading dimension. A further object of this invention is to provide article group transfer structures which are stabilized for high speed operation.

US-A-4936077 discloses a carton loading machine comprising a frame and means for displacing article groups into the open end of a carton. The movements of pusher assemblies are guided by a guide track assembly. The disclosure of this document corresponds generally to the preamble of claim 1.

According to the present invention, there is provided a lateral transfer apparatus for use in a continuous packaging system of the type wherein article groups comprising at least one article being transported in a longitudinally oriented stream are loaded into open sides of synchronised article packages travelling in a second longitudinal stream, comprising a frame, a plurality of transfer elements disposed at predetermined longitudinally spaced intervals, said transfer elements being for laterally moving article groups which are being longitudinally transported in an article group transport stream, means to longitudinally move said transfer elements, and means to laterally move said transfer elements; the apparatus being characterised in that each article group is disposed on a slide plate and aligned for entry into a package, wherein the slide plate has an elongated, laterally oriented slot of a predetermined width, and in that there is further provided a stabilization member disposed on each said transfer element for mating insertion into said slide plate slot during lateral extension of said transfer elements.

FIG. 1 is a side view of a cartoner assembly incorporating a lateral transfer mechanism of the present invention;
FIG. 2 is a top plan view of the cartoner assembly;
FIG. 3 is a detailed top plan view of the cartoner assembly;
FIG. 4 is a top plan view of a portion of the cartoner assembly;
FIG. 5 is a top view of a portion of the crossloading mechanism;
FIG. 6 is a cross-sectional view of the cartoner apparatus taken approximately along line 6-6 of FIG. 2 showing the article group transfer mechanism;
FIG. 7 is a top view of a loader arm assembly;
FIG. 8 is a combined side and end view of a pushing face;
FIG. 9 is an end view of the loader arm assembly taken along line 9-9 of FIG. 7;
FIG. 10 is an end view of a loader arm guide; and
FIG. 11 is a cross-sectional view of a loader arm assembly operatively extended across the article group selection and transport mechanism.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The apparatus of the present invention is for loading articles into cartons in a continuous, high speed process. As shown in the drawings, the article group transfer apparatus of this invention is utilized in a continuous, high-speed packaging mechanism 10 to provide reliable, continuous and high speed packaging of articles or products of varying types, sizes and quantities into cartons of varying types and sizes. For example, the apparatus 10 loads standard beverage cans or bottles into 24(12/12), 30(15/15) and 36(18/18) pack stacked combinations and also into common single level 6, 8, 12, 15, 18 and 26 pack configurations utilizing the adjustment features described more fully below. Moreover, the process of loading beverage containers into paperboard carriers, for example, is accomplished quickly and reliably, under typical industry tolerances for both container and carrier construction. The resultant filled carriers output by the apparatus 10 are of uniform consistency having maximized squareness and tautness for improved storage qualities and transportability.

Referring to **FIGS. 1** and **2**, the continuous motion cartoner 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 consistent with the teachings of this invention.

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 spacially 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 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 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 of the article group selecting mechanism 12 to form the stacked group 23. The divider placement mechanism 15 preferably comprises a rotary placer mechanism 92 of the type manufactured and sold by Applicants' assignee.

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 crossloading 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 crossloading 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.

Still referring also to **FIGS. 1 and 2**, the carton supply and transport mechanism 11 is preferably a rotary type carton placer 49, such as that disclosed in U.S. Patent 4,530,686 owned by Applicants' assignee. The carton erecting apparatus 49 is supported above the input end of the carton transport mechanism 11 by a vertically adjustable frame structure 50, and basically transfers flat carton blanks or sleeves 25 from a power magazine 51 to the conveyance surface of the mechanism 11, simultaneously opening the blank 25 so that it assumes a four-sided configuration with opposing open ends bounded by at least one flap 44 each. Importantly, the partially erected carton 25 is placed in a transverse or lateral orientation so that its ends are open to the sides of the carton transport mechanism 11 for loading purposes.

The carton transport conveyor 52 receives cartons 25 from the carton supply placer 49 and transports them linearly downstream with respect to the overall apparatus 10. The downstream transport of cartons 25 is synchronized with the article group selection and transport mechanism 12 and with the crossloading mechanism 16, as described further below, to effectuate carton 25 loading. The carton transport conveyor 52 is adjustable to accommodate cartons 25 of varying types and sizes. Referring also to **FIGS. 3, 4 and 6**, the carton transport conveyor 52 basically comprises a plurality of flight lugs 56 which are connected to a pair of flight chains 181 and 182, the flight chains 181 and 182 being connected to and revolving about drive and idler ends 53 and 54. Although a pair of lugs 56 is shown, the number of lugs 56 per carton 25 may be varied for alternative carton configurations. The transverse and longitudinal spacing between lugs 56 on the parallel, side-by-side chains is preferably variable. Adjustment is desirable to permit the apparatus 10 to be used with various carton configurations to allow for adjustment of carton spacing to convert the apparatus 10 from 6 to 36 pack processing for example. The carton supply and transport mechanism 11 may also include a carton stabilization structure (not shown) to support the tops of the relatively tall, bi-level cartons 25 traveling on the mechanism 11, particularly during the loading phase of operation.

Referring to **FIGS. 1-4**, the first or low article supply mechanism 13 provides a plurality of input individual articles 20 to the apparatus 10 at a first predetermined level or height and at a predetermined point on the article group selection and transport mechanism 12. The mechanism 13 is shown to comprise a conveyor 60 disposed about a drive sprocket/shaft assembly 61 and an idler sprocket/shaft assembly 62. The conveyor 60 preferably consists of a unitary, belt. Articles 20 transported on the top, forward run of the conveyor 60 are separated into a plurality of single file paths by lane separators 63. Each lane separator 63 has a terminal portion 64 of a predetermined length, such that it extends into the path of the article group selection and transport mechanism

12. Each terminal portion 64 is constructed such that it allows longitudinally transported flight structures 74 (described further below) of the article group selection and transport mechanism 12 to pass through the angled conveyance lanes. As the flight bars 74 mesh with and pass through the lane separator end portions 64, they engage articles 20 disposed in lanes and rake them onto the longitudinal conveyance path of the mechanism 12 and between adjacent flight bars 74.

The combination of forces exerted by the flight bars 74, lane ends 64, and conveyors 60 and 12 serve to select and meter individual articles 20 into predetermined article groups 21 which are fully merged onto the article group selection and transport mechanism 12. The size, orientation and dimensions of the resultant product groups 21 is dependent upon the number of infeed lanes, product dimensions, and the configuration and spacing of the flight bars 74. Lanes may be blocked off by closure means 67 to alter the group 21 size and/or orientation. The lane separators 63 and the flight bars 74 are adjustable to provide full variability of product group parameters.

The article group selection and transport mechanism 12 selects article groups 21 and 22 from the first or low article supply mechanism 13 as set forth above and from the second or high article supply mechanism 19 discussed below, and transports them linearly downstream with respect to the overall apparatus 10. The downstream transport of article groups 21 and 22 is synchronized with the carton supply and transport mechanism 11 and with the crossloading mechanism 16, as described further below, to effectuate carton 25 loading. The article group selection and transport mechanism 12 comprises a conveyor 73, a plurality of flight bar assemblies 74 fixed to and longitudinally transported on the conveyor 73, and a plurality of slide plates 75, which are disposed on the conveyor 73 between the spaced flight bars 74. The conveyor 73 includes a drive sprocket/shaft assembly 76 and an idler sprocket/shaft assembly 77, a pair of parallel endless conveyor chains 78 which are connected to and revolve about the sprocket/shaft assemblies 76 and 77, forming a longitudinally extending forward or top run 79 and a return or bottom run 80.

Referring also to **FIGS. 4 and 6**, the flight bar assemblies 74 are each shown to include a top rail member 83 and a bottom rail member 84 which are connected to one another by vertical spacers 85. The top and bottom members 83 and 84 are shown disposed parallel to one another and spacially separated by the spacers 85. Each top and bottom member 83 and 84 further has an angled front end 150 and an elongated, rectilinear body 151 terminating in a flat back end. The front end 150 slants or angles inwardly from its leading edge to its trailing edge to enable the flight bars 74 to select individual articles 20 disposed in the article infeed lanes and to separate them from the closely spaced nearest upstream article 20. As is best shown in **FIG. 4**, a pair of fixed slide plates 152 and 153 are connected to each flight bar 74 assembly. Both the flight bars 74 and the slide plates 152 and 153 are connected to the flight chains 78 via connection brackets 86. The slide plates 152 and 153 are thin, flat structures with a low friction top surface which support the lower article groups 21 and further permit sliding movement thereon. Additionally, slotted slide plates 154 are disposed between adjacent flight bar assemblies 74. Importantly, each plate 154 includes a laterally oriented slot 155 of a predetermined width which extends the length of the plate 154 and is open at both of its ends.

Referring again to **FIGS. 1 and 2**, the second or high article supply mechanism 14 provides a plurality of input individual articles 20 to the apparatus 10 at a second predetermined level or height and at a predetermined point downstream from the low article supply mechanism 13. The mechanism 14 is also shown to comprise a pair of conveyors 100 and 101, each being disposed about a drive sprocket/shaft assembly and an idler sprocket/shaft assembly. Articles 20 transported on the top, forward run of the conveyors 100 and 101 are separated into a plurality of single file paths by lane separators 102. Each lane separator 102 has a terminal portion 103 of a predetermined length, such that it extends into the path of the article group selection and transport mechanism 12 a predetermined distance. Each terminal portion 103 is constructed such that it allows the longitudinally transported flight structures 74 of the article group selection and transport mechanism 12 to pass through the angled conveyance lanes. As the flight structures 74 mesh with and pass through the lane separator end portions 103, they engage articles 20 disposed in lanes and rake them onto the longitudinal conveyance path of the mechanism 12.

The article group lateral transfer or crossloading mechanism 16 is synchronized with the aforementioned apparatus 10 elements to move completed, stacked article groups 23 traveling on the article group selection and transport conveyor 12 into aligned cartons 25 traveling on the carton supply and transport conveyor 11. Referring to **FIGS. 3-11**, the crossloading mechanism 16 basically comprises a plurality of loader arm assemblies 110, a flight chain and guide tube assembly 111 to which the loader arm assemblies 110 are attached at predetermined intervals, and which provides a longitudinal movement component thereto, and a control cam assembly 112 which provides a predetermined transverse motion component to the loader arm assemblies 110.

The flight chain and guide tube assembly 110 has a forward or top run 113 and a return or bottom run 114 and comprises drive and idler sprocket/shaft assemblies 115 and 116 and a pair of spacially parallel flight chains 117 and 118 which are connected to and revolve about the sprocket/shaft assemblies 115 and 116. The flight chains 117 and 118 are maintained in a rectilinear configuration on both the top and bottom runs 113 and 114 by chain guides 119 and 120, which are linked to the frame 17 via vertical support members 121.

Pairs of elongated guide tubes 122 are disposed at predetermined intervals along the flight chains 117 and 118, each guide tube 122 being directly connected at one end to the outer flight chain 118, and at its opposite end to the inner flight chain 117 so that they are oriented transversely with respect to the axis of the apparatus 10 and to the downstream or forward run of the crossloader 16. The guide tubes 122 have a low friction exterior surface to provide slidable support of the loader arm assemblies 110. The pairs of closely spaced tubes 122 increase the stability of transverse movement of the arm assemblies 110. Further stability is attained by the guide blocks 123 (connected to the inner ends of the guide tubes 122 via set screws) traveling in a longitudinally oriented guide rail 124 which is linked to the frame 17 via a support 125. As best shown in **FIG. 10**, lateral retainers 126 are mounted on the top of each guide block 123 to guide the transversely moving arm assemblies 110. The spacing between successive sets (pairs) of tubes 122 corresponds to the spacing between the flight bars 74 of the article group selection and transport conveyor 12 and of the flight lugs 56 of the carton transport conveyor 11 so that the arm assemblies 110 are aligned to push product groups 23 from between the flight bars 74 into the cartons 25.

The loader arm assemblies 110 are movably mounted on the guide tubes 122, and in a transverse orientation with respect to the axis of the apparatus 10. The arm assemblies 110 are conveyed in a downstream, longitudinal direction while they simultaneously reciprocate in a transverse direction under the control of a cam mechanism 112 described below. Each loader arm assembly 110 basically comprises an elongated, rectilinear base plate 127 and a loading head 128 located at one end of the base plate 127. The base plate 127 is shown to have a rigid, flat, elongated structure which is oriented horizontally. A rigid stiffing bar 129 is connected to the top surface of the base plate 127, vertically oriented, to increase the rigidity and strength of the arm assembly 110. Preferably, a plurality of bores are disposed in the stiffing bar 129 to reduce its weight. The inwardly disposed end of the base plate 127 is slidably supported by the lateral retainers 126 of the guide block 123. A first or outer bushing block 130 is connected to the bottom of the base plate 127 at its opposite end. The first bushing block 130 has a pair of apertures, including bushings, through which the guide tubes 122 are slidably extended. A second or inner bushing block 131 is similarly connected to the base plate 127 and interfaces with the guide tubes 122 a short distance from the first bushing block 130. The bushing blocks 130 and 131 are further connected by a spreader bar 132 which is oriented and rides in the space between the guide tubes 122. A rotatable cam follower 133 is connected to the bottom of the spreader bar 132. The longitudinally traveling cam follower 133 cooperates with the cam guide assembly 112 to cause the arm assembly 110 elements to transversely reciprocate on the guide tubes 122 and through the lateral retainers 126 of the guide block 123.

The loading head 128 is shown to have two fixed, flat face members 134 and 135. As the arm assemblies 110 move forward, the face members 134 and 135 push the article groups forward from the article group selection transport conveyor 12 into the cartons 25. A support roller 144 is disposed on the bottom of the head 128 to provide support when the head 128 is extended across the article group selection and transport mechanism 12. Additionally, a t-shaped guide pin 145 is disposed on the bottom of the base plate 127 of the arm assembly 110 to mate with the slot 155 in slide plate 154 to laterally stabilize the arm member 110 during high speed operation. The loading head 128 configuration is variable to interface with a wide range of product group 23 configurations. Although in the instant embodiment the head 128 is configured for use with a stacked configuration, the head 128 can be modified for cartoning various other product and product group arrangements, including non-stacked configurations. Head 128 modification is accomplished by changes in the configuration of the face members 134 and 135. A transition conveyor 29, shown in **FIGS. 5 and 6**, is disposed between the crossloading mechanism 16 and the carton transport mechanism 12 to provide a moving base for the movement of the article groups 23 into the longitudinally conveyed cartons 25. A fixed dead plate may alternatively be used. The bottom member 84 of the flight bars 74 is elongated to extend across the top run of the transition conveyor 29 to guide or funnel article groups 23 across the conveyor 29 and into the cartons 25, between the carton end panels 44.

The loader control cam assembly 112 controls the transverse, reciprocal motion of the arm assemblies 110. The loader control cam assembly 112 is generally oriented longitudinally with respect to the overall crossloading mechanism 16, and has a top or forward run 136 and a bottom or return run 137 corresponding to the revolving arm assemblies 110. The top run 136 basically comprises an inwardly sloping approach segment 137, an apex 138, and an outwardly sloping return segment 139. In the approach segment 137, the cam follower 133 is urged inwardly, and drives each arm assembly 110 into moving engagement with a product group 23 until it is loaded in a carton 25. A lag segment 146 of decreased slope is disposed at a predetermined point where the loading head 128 first contacts the article group 23 to provide gentle, even pressure at this initial contact point. In the return segment 139, the face 128 is retracted from the carton 25 prior to its being reset in the return run 137 of the cam assembly 112. The forward run 136 of the cam assembly 112 comprises an outer rail 140 and an inner rail 141 which is spaced from the inner rail 140 a distance equivalent to the diameter of the cam follower 133. The follower 133 is disposed in a cam pathway formed between the outer and inner rails 140 and 141 to effectuate transverse, inward motion to the arm assemblies 110. Preferably, the outer rail 140 is connected to a pivot point 142 at

one end and to a release mechanism, such as a pressure release cylinder and piston 143 proximate its opposite end. The release mechanism 143 is controlled by a sensing mechanism, for example, a photoeye or capacitive proximity sensor, such that if an excessive force is placed on the outer rail 140, for example due to a jamming of the arm assembly 110, the release mechanism 143 will be actuated releasing the outer rail 140 which pivots about point 142.

The bottom or return run 137 of the cam assembly 112 includes circular guide plates 148 and 149, and a bottom cam rail 147 which contacts the cam follower 133 to further retract and reset the loader arms 110 for further loading cycles. Since the loader arms 110 are substantially extended when they revolve around sprocket/shaft assembly 115, it is critical that they be stabilized by the guide pin 145 in slide plate 154 groove 155 during high speed operation.

As shown in **FIGS. 2, 3, and 4**, lateral and medial flap tuckers 30 and 31 are disposed adjacent each side of the carton transport mechanism 11, one anterior to the loading region to provide a closed carton backside against which the loaded containers may nest, and one posterior to the loading region to allow article group 23 ingress to the carton 25 through its open, unglued end flaps 44. As shown in **FIGS. 1 and 3**, gluing, compression and discharge mechanisms 32, 33, 34, 35 and 37 are disposed further downstream and adjacent the carton supply and transport mechanism 11 to complete the carton flap securement process.

Claims

1. A lateral transfer apparatus (16) for use in a continuous packaging system (10) of the type wherein article groups (23) comprising at least one article being transported in a longitudinally oriented stream are loaded into open sides of synchronised article packages travelling in a second longitudinal stream, comprising a frame, a plurality of transfer elements (110) disposed at predetermined longitudinally spaced intervals, said transfer elements being for laterally moving article groups which are being longitudinally transported in an article group transport stream, means to longitudinally move said transfer elements, and means to laterally move said transfer elements; the apparatus being characterised in that each article group is disposed on a slide plate (154) and aligned for entry into a package, wherein the slide plate has an elongated, laterally oriented slot (155) of a predetermined width, and in that there is further provided a stabilization member (145) disposed on each said transfer element for mating insertion into said slide plate slot during lateral extension of said transfer elements.

2. A lateral transfer apparatus according to claim 1, wherein the transfer elements (110) comprise loading arm assemblies each having a base plate (127) and a contact member (128).

3. A lateral transfer apparatus according to claim 2, wherein the contact member comprises a loading head with removable face members (134, 135).

4. A lateral transfer apparatus according to any preceding claim, wherein said transfer elements (110) are constructed and arranged along an endless longitudinally oriented loop to be conveyed longitudinally in a top, forward run and a bottom, return run on said frame structure.

5. A lateral transfer apparatus according to claims 2 or 3 and 4, wherein said transfer elements (110) comprise a support member connected to said contact member (128) and to said longitudinal movement means, and a control member connected to said support member and to said lateral movement means to direct the lateral movement of said transfer elements.

6. A lateral transfer apparatus according to claim 5, wherein said support member comprises a laterally oriented, elongated base member having a first end at which said contact member is disposed and a second end, at least one bearing block disposed proximate each said base member end, and at least one slide rail aligned and disposed spacially parallel with respect to said base member and slidably mated with said bearing blocks, said slide rail further being connected to said longitudinal movement means.

7. A lateral transfer apparatus according to claim 6, wherein said lateral movement means comprises a cam track having a predetermined configuration.

8. A lateral transfer apparatus according to claim 7, wherein said control member comprises a cam follower connected to said support member, said cam follower being cooperatively mated with said cam track.

9. A lateral transfer apparatus according to claim 7 or 8, wherein said cam track configuration provides a constant rate of lateral extension to said transfer elements throughout a majority of a total extension path of each said transfer element, said cam track configuration further providing a decreased rate of lateral extension at a predetermined segment of said transfer element extension path for making smooth contact with the article.

10. A lateral transfer apparatus according to claim 6, wherein said longitudinal movement means comprises a pair of parallel, spaced driven chains each supported by a rectilinear guide along a top, forward longitudinal run thereof, each said support

member slide rail being connected at one end to one chain and at an opposite end to the other chain.

11. A lateral transfer apparatus according to any preceding claim, wherein the apparatus is used to load article groups comprising at least one article into the open sides of synchronized article carriers in a continuous packaging process.

Patentansprüche

1. Vorrichtung (16) zum seitlichen Transport zur Verwendung in einem kontinuierlichen Verpackungssystem (10) von dem Typ, bei dem Artikelgruppen (23) mit wenigstens einem Artikel, der in einem Längsfluß transportiert wird, in offene Seiten von synchronisierten Artikelverpackungen geladen werden, die sich in einem zweiten Längsfluß bewegen, enthaltend einen Rahmen und eine Vielzahl von an vorbestimmten, in Längsrichtung beabstandeten Zwischenräumen angeordneten Transportelementen (110), wobei die Transportelemente zur seitlichen Bewegung der Artikelgruppen dienen, die in einem Artikelgruppen-Transportfluß in Längsrichtung transportiert werden, mit Mitteln zum Bewegen der Transportelemente in Längsrichtung und mit Mitteln zum seitlichen Bewegen der Transportelemente,
dadurch gekennzeichnet,

- **daß** jede Artikelgruppe auf einer Gleitplatte (154) angeordnet und zum Eintritt in eine Verpackung ausgerichtet ist, wobei die Gleitplatte einen länglichen, seitlich gerichteten Schlitz (155) vorbestimmter Breite aufweist, und
- **daß** außerdem auf jedem Transportelement ein Stabilisierungsteil (145) vorgesehen ist, um den Eintritt in den Schlitz der Gleitplatte während der seitlichen Bewegung der Transportelemente zu fördern.

2. Vorrichtung zum seitlichen Transport nach Anspruch 1,
bei der die Transportelemente (110) Anordnungen mit einem Beledearm enthalten, die je eine Grundplatte (127) und ein Kontaktteil (128) aufweisen.

3. Vorrichtung zum seitlichen Transport nach Anspruch 2,
bei der das Kontaktteil einen Ladekopf mit entfernbaren Schildteilen (134, 135) enthält.

4. Vorrichtung zum seitlichen Transport nach einem der vorangehenden Ansprüche,
bei der die Transportelemente (110) entlang einer endlosen Längsschleife ausgebildet und angeordnet sind und so eine Förderung in Längsrichtung in einem oberen Vorwärtslauf und einem unteren Rückwärtslauf auf dem Rahmenaufbau bilden.

5. Vorrichtung zum seitlichen Transport nach Anspruch 2 oder 3 und 4,
bei der die Transportelemente (110) ein Stützteil, das mit dem Kontaktteil (128) und den Mitteln für die Längsbewegung verbunden ist, und ein Steuerteil aufweisen, das mit dem Stützteil und den Mitteln für die seitliche Bewegung verbunden ist, um dadurch die seitliche Bewegung der Transportelemente zu lenken.

6. Vorrichtung zum seitlichen Transport nach Anspruch 5,
bei der das Stützteil ein seitlich orientiertes längliches Basisteil aufweist, das ein erstes Ende, an dem das Kontaktteil angeordnet ist, sowie ein zweites Ende enthält, wobei wenigstens ein Lagerbock jeweils am Ende des Basisteils angeordnet ist und wenigstens eine Gleitschiene enthält, die räumlich parallel zu dem Basisteil angeordnet ist und gleitend an die Lagerblöcke angepaßt ist, und wobei die Gleitschiene außerdem mit den Mitteln für die Längsbewegung verbunden ist.

7. Vorrichtung zum seitlichen Transport nach Anspruch 6,
bei der die Mittel für die seitliche Bewegung eine Nockenlaufbahn enthalten, die eine vorbestimmte Form hat.

8. Vorrichtung zum seitlichen Transport nach Anspruch 7,
bei der das Steuerteil einen Nockenstößel enthält, der mit dem Stützteil verbunden ist, wobei der Nokkenstößel funktionsmäßig an die Nockenlaufbahn angepaßt ist.

9. Vorrichtung zum seitlichen Transport nach Anspruch 7 oder 8,
bei der die Form der Nockenlaufbahn einen konstanten Betrag an seitlicher Ausdehnung für die Transportelemente über eine Mehrheit des gesamten Ausdehnungsweges jedes Transportelementes enthält, wobei die Form der Nockenlaufbahn außerdem ein verringertes Maß an seitlicher Ausdehnung bei einem vorbestimmten Segment des Ausdehnungsweges für das Transportelement enthält, um einen welchen Kontakt mit dem Artikel herzustellen.

10. Vorrichtung zum seitlichen Transport nach Anspruch 6,
bei der die Mittel für die Längsbewegung ein Paar von parallelen beabstandeten angetriebenen Ketten enthalten, von der jede durch eine geradlinige Führung entlang eines oberen Vorwärtslängsweges gehalten wird, und wobei jede Gleitschiene des Stützteils an einem Ende mit einer Kette und an dem entgegengesetzten Ende mit der anderen Kette verbunden ist.

11. Vorrichtung zum seitlichen Transport nach einem der vorangehenden Ansprüche,
bei der die Vorrichtung dazu verwendet wird, Artikelgruppen, die wenigstens einen Artikel enthalten, in die offenen Seiten von synchronisierten Artikelträgern in einem kontinuierlichen Verpackungsprozess zu laden.

Revendications

1. Appareil de transfert latéral (16) pour utilisation dans un système d'empaquetage continu (10) du type où des groupes d'articles (23) comportant au moins un article transporté suivant un flux orienté longitudinalement sont chargés dans les côtés ouverts d'emballages d'articles synchronisés se déplaçant suivant un deuxième flux longitudinal, comprenant un châssis, une pluralité d'éléments de transfert (110) disposés à des intervalles longitudinalement espacés prédéterminés, lesdits éléments de transfert étant prévus pour déplacer latéralement des groupes d'articles qui sont transportés longitudinalement dans un flux de transport de groupes d'articles, des moyens pour déplacer longitudinalement lesdits éléments de transfert, et des moyens pour déplacer latéralement lesdits éléments de transfert; l'appareil étant caractérisé en ce que chaque groupe d'articles est disposé sur une plaque de coulissement (154) et aligné pour l'entrée dans un emballage, où la plaque de coulissement présente une fente oblongue, orientée latéralement (135) d'une largeur prédéterminée, et en ce qu'il est réalisé en outre un élément de stabilisation (145) disposé sur chaque élément de transfert précité pour une insertion appariée dans ladite fente de plaque de coulissement pendant l'extension latérale desdits éléments de transfert.

2. Appareil de transfert latéral selon la revendication 1, où les éléments de transfert (110) comportent des ensembles de bras de chargement chacun ayant une plaque de base (127) et un élément de contact (128).

3. Appareil de transfert latéral selon la revendication 2, où l'élément de contact comporte une tête de chargement avec des éléments de face amovibles (134, 135).

4. Appareil de transfert latéral selon l'une des revendications précédentes, où lesdits éléments de transfert (110) sont construits et agencés le long d'une boucle sans fin orientée longitudinalement pour être transportés longitudinalement dans un passage supérieur vers l'avant et un passage inférieur vers l'arrière sur ladite structure de châssis.

5. Appareil de transfert latéral selon les revendications 2 ou 3 et 4, où lesdits éléments de transfert (110) comportent un élément de support relié audit élément de contact (128) et audit moyen de mouvement longitudinal, et un élément de commande relié audit élément de support et audit moyen de mouvement latéral pour diriger le mouvement latéral desdits éléments de transfert.

6. Appareil de transfert latéral selon la revendication 5, où ledit élément de support comporte un élément de base oblong orienté latéralement ayant une première extrémité à laquelle ledit élément de contact est disposé et une deuxième extrémité, au moins un bloc de palier disposé à proximité de chacune desdites extrémités d'éléments de base, et au moins un rail de coulissement aligné et disposé spatialement parallèlement relativement audit élément de base et apparié de façon coulissante avec lesdits blocs de palier, ledit rail de coulissement étant en outre relié audit moyen de mouvement longitudinal.

7. Appareil de transfert latéral selon la revendication 6, où ledit moyen de mouvement latéral comporte une piste de came d'une configuration prédéterminée.

8. Appareil de transfert latéral selon la revendication 7, où ledit élément de commande comporte un suiveur de came relié audit élément de support, ledit suiveur de came étant coopérativement apparié avec ladite piste de came.

9. Appareil de transfert latéral selon la revendication 7 ou 8, où ladite configuration de piste de came fournit une vitesse constante d'extension latérale auxdits éléments de transfert sur une majorité d'un trajet d'extension totale de chacun desdits éléments de transfert, ladite configuration de piste de came fournissant en outre une vitesse diminuée d'extension latérale à un segment prédéterminé dudit trajet d'extension d'élément de transfert pour établir un contact en douceur avec l'article.

10. Appareil de transfert latéral selon la revendication 6, ou ledit moyen de mouvement longitudinal comporte une paire de chaînes menées espacées parallèles, chacune supportée par un guidage rectiligne le long d'un passage longitudinal supérieur vers l'avant de celles-ci, chaque rail de coulissement précité de l'élément de support étant relié à une extrémité à une chaîne et à une extrémité opposée à l'autre chaîne.

11. Appareil de transfert latéral selon l'une des revendications précédentes, où l'appareil est utilisé pour charger des groupes d'articles comprenant au moins un article dans les côtés ouverts de supports d'articles synchronisés dans un procédé d'empaquetage continu.

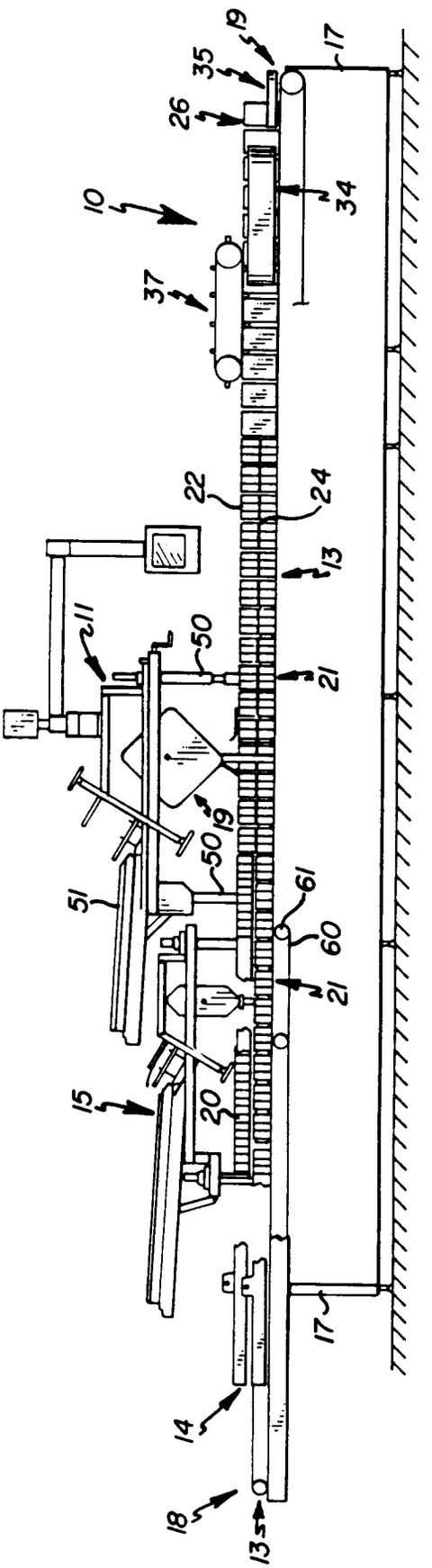

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Fig. 1

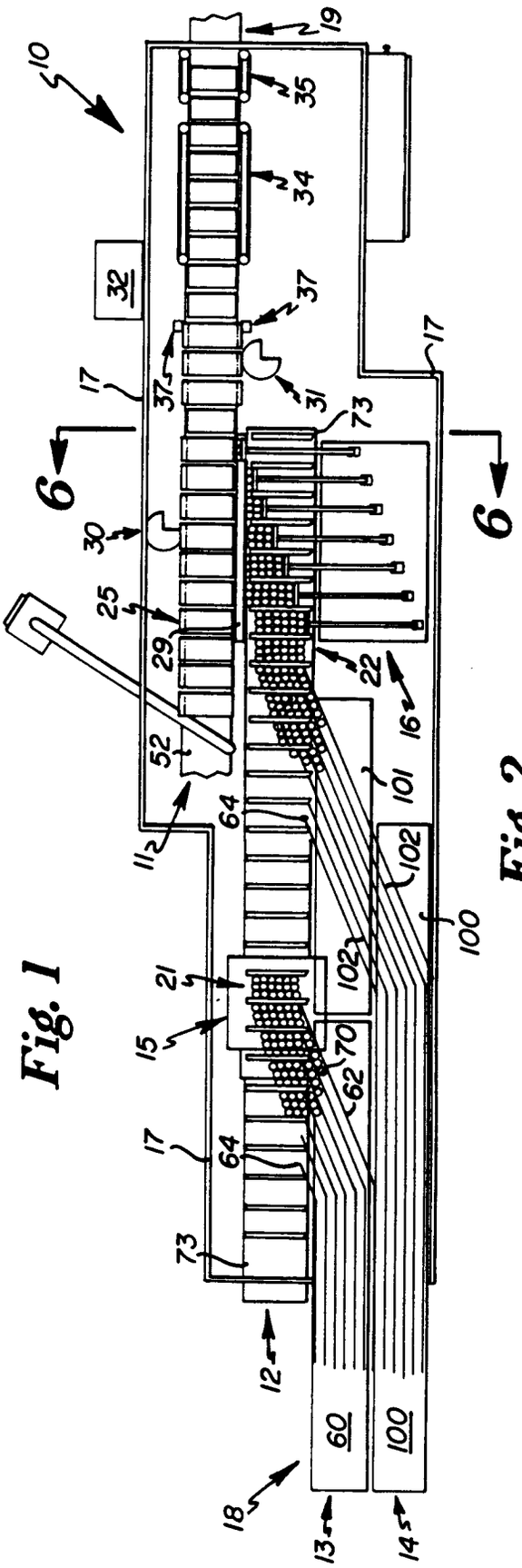

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Fig. 2

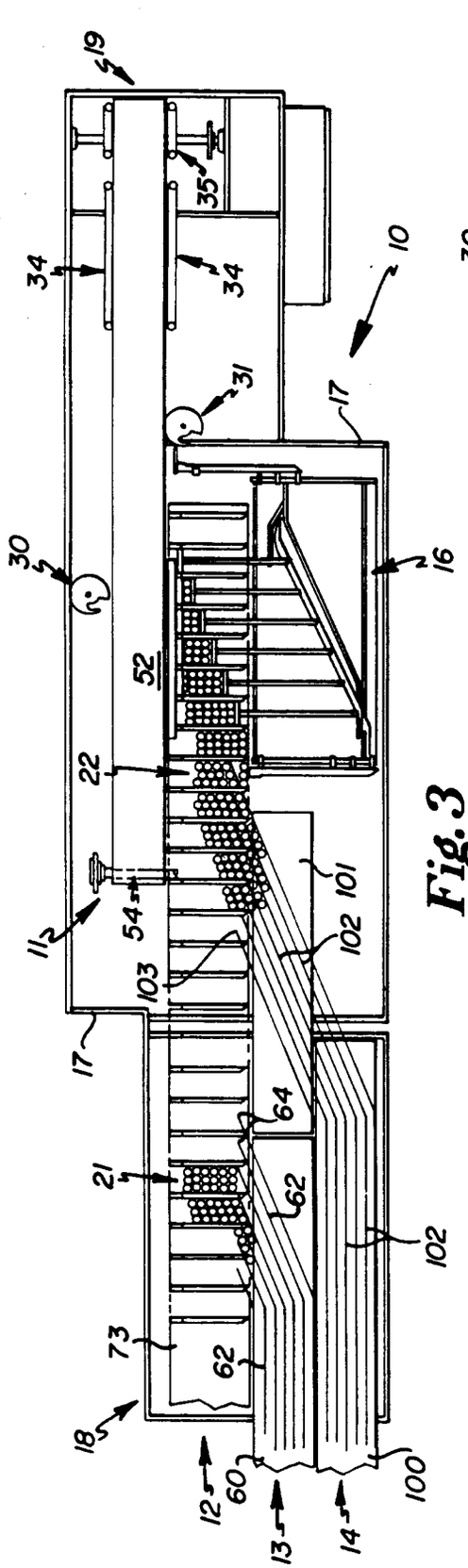


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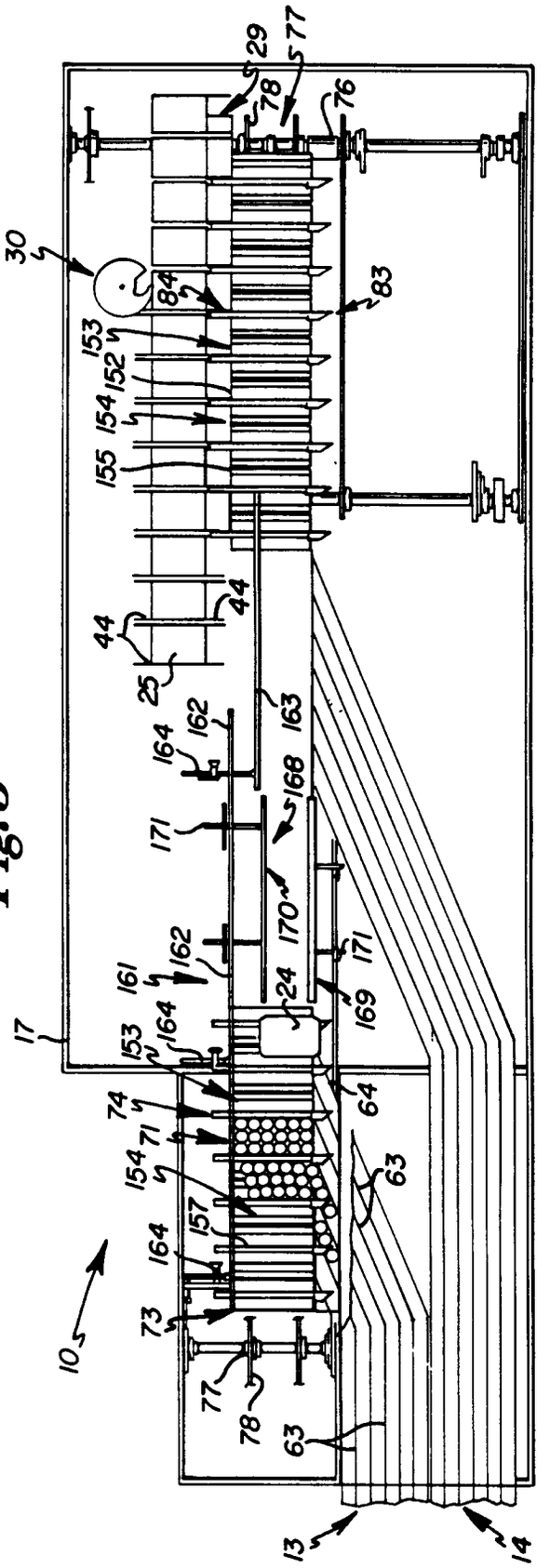


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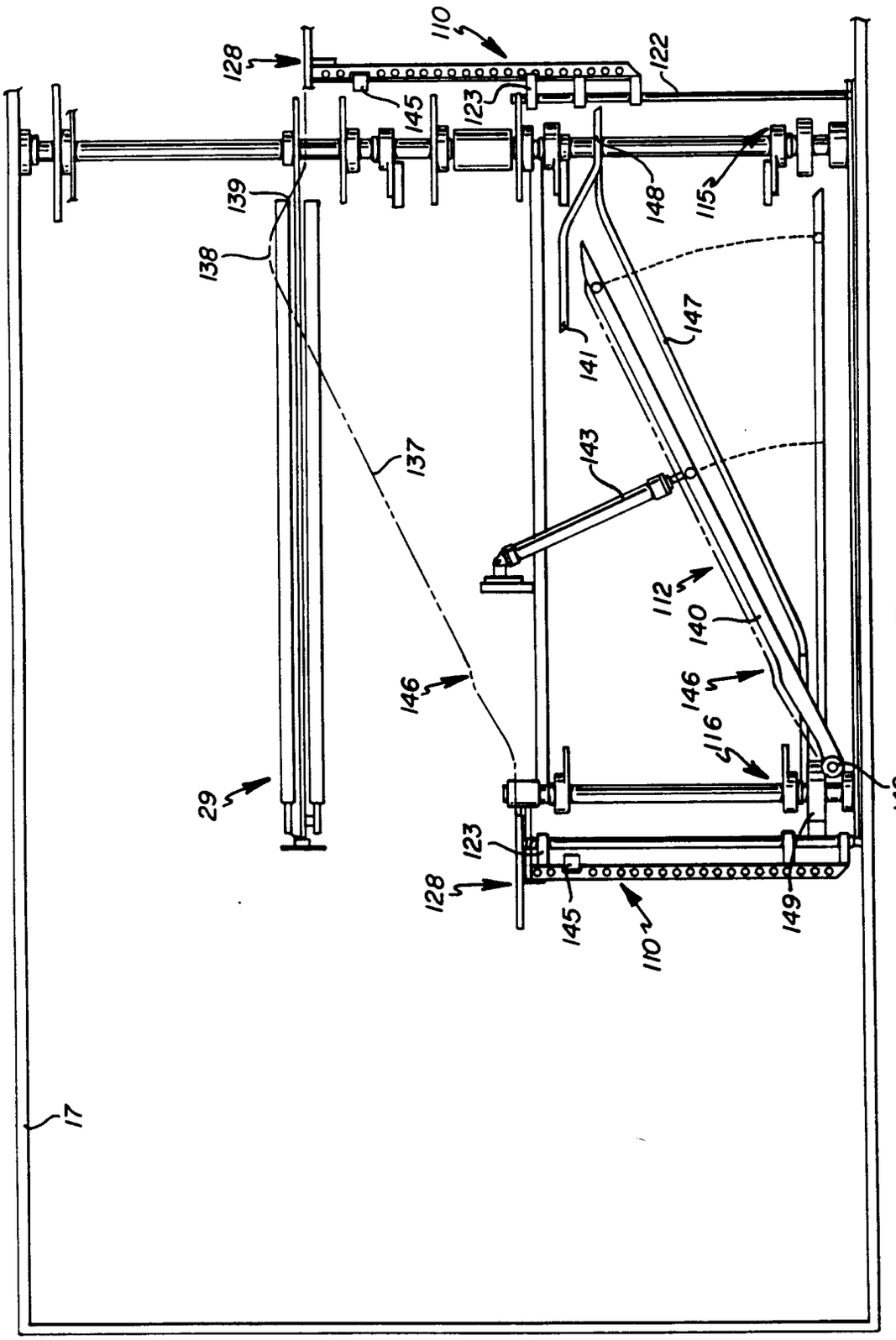

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Fig. 5

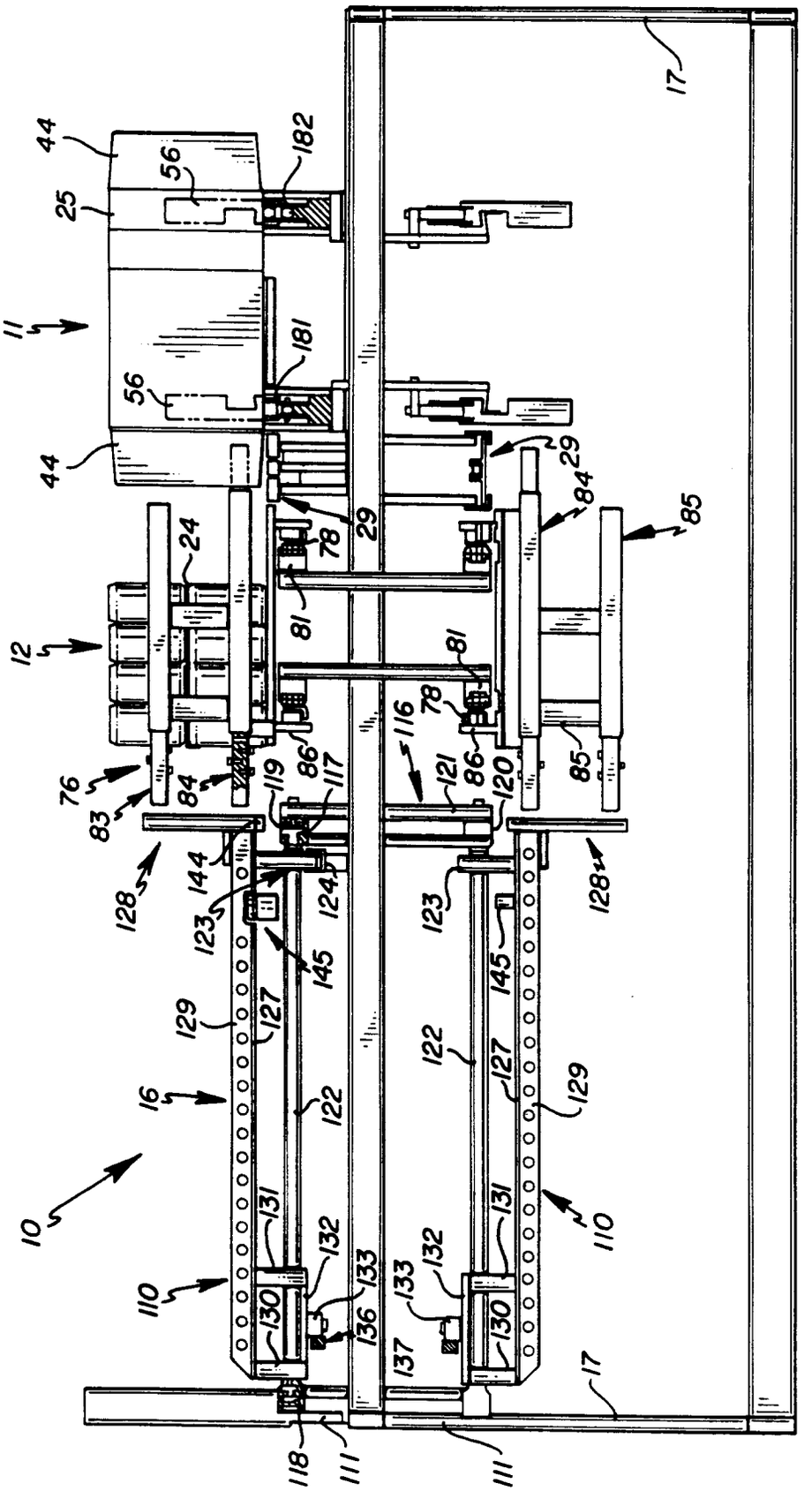

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Fig. 6

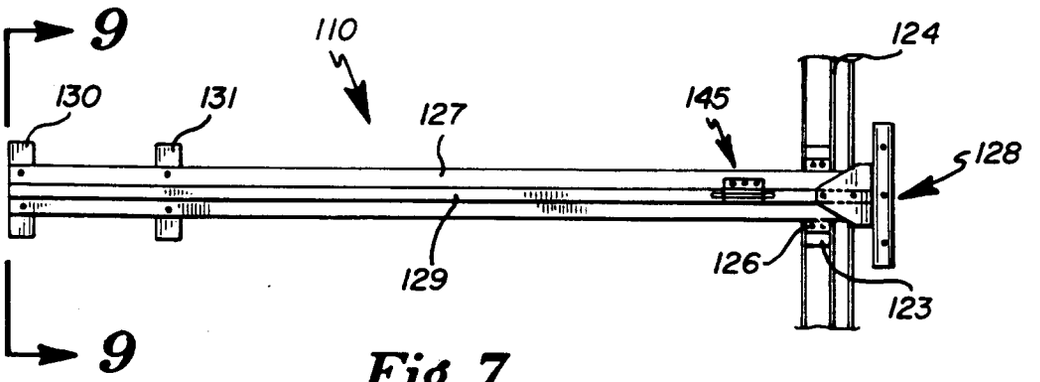


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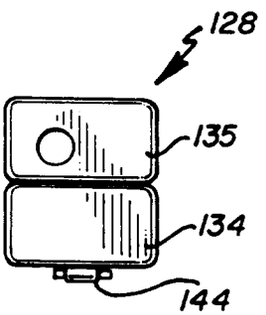


Fig. 8a

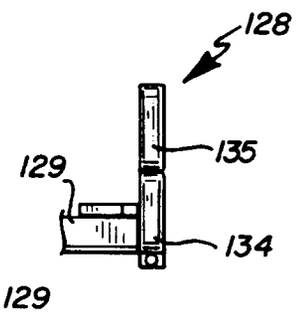


Fig. 8b

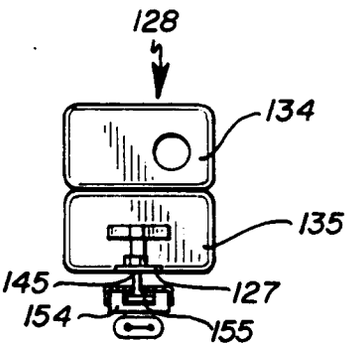


Fig. 11

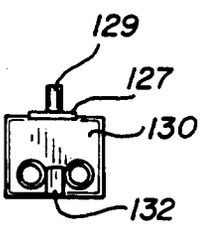


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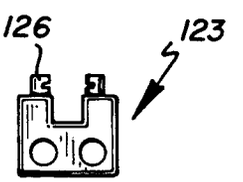


Fig. 10