United States Patent [19]

Jensen et al.

[11] **3,780,486**

[45] **Dec. 25, 1973**

[54] **METHOD OF PACKAGING**

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[73] Assignee: **Oscar Mayer & Co., Inc.**, Madison, Wis.

[22] Filed: **July 29, 1971**

[21] Appl. No.: **167,221**

Related U.S. Application Data

[62] Division of Ser. No. 16,787, March 5, 1970, Pat. No. 3,645,065.

[52] **U.S. Cl.** **53/14,** 53/64

[51] **Int. Cl.** **B65b 57/00,** B65c 9/08

[58] **Field of Search** 53/30, 64, 65, 131, 53/137, 184, 14; 156/350, 360, 363, 364, 384

[56] **References Cited**

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Primary Examiner—Donald G. Kelly
Assistant Examiner—Neil Abrams
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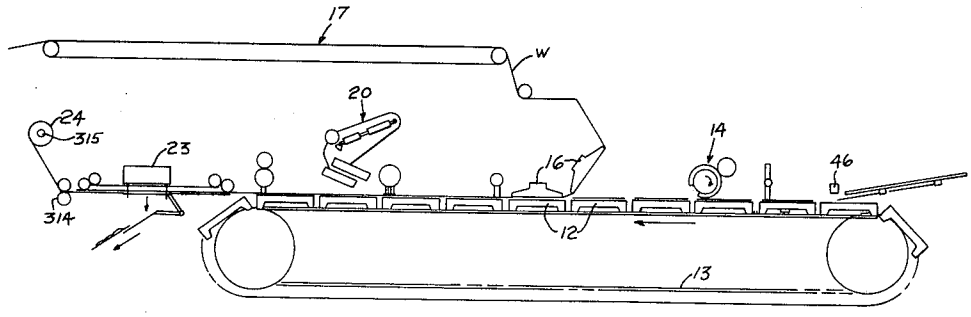
[57] **ABSTRACT**

A method and apparatus for packaging products, such as assemblies of bacon slices and the like, which are advanced from a supply source in random order on backing boards having identifying indicia for controlling certain of the subsequent packaging operations and the application of the proper one of two differnt labels according to the indicia on the respective boards. The assemblies are advanced to the horizontal top run of a lower conveyor carrying successive package platters, past an electric eye which scans the identifying indicia and which actuates mechanism to position or set a series of cams carried on the back face of each of the packaging platters for controlling subsequent operations. An upper conveyor carrying package forming platters for mating with the platters on the lower conveyor lays down a covering web and forms vacuumized and sealed packages between pairs of mating platters. The cams control operation of mechanism for applying adhesive to the backing board prior to advance of the boards to the upper conveyor and also a label applying device beyond the upper conveyor which has a dual label supply magazine and an associated adhesive activator and applicator for applying to the packages either of two labels according to the cam setting on the bottom of the platter on the lower conveyor which carries the package. The apparatus includes a platen identification printer and a code dater preceding and following the labeling device. Upon the application of the label, the packages are transferred to the bottom run of an outfeed conveyor having package suspending pins which carry the connected packages between a vertically reciprocating trimming die and a co-operating bottom anvil for severing the packages from the web so as to permit discharge of the separated packages from the apparatus with the waste resulting from the trimming operation being forced loose from the pins and wound on a reel at the end of the outfeed conveyor.

3 Claims, 37 Drawing Figures



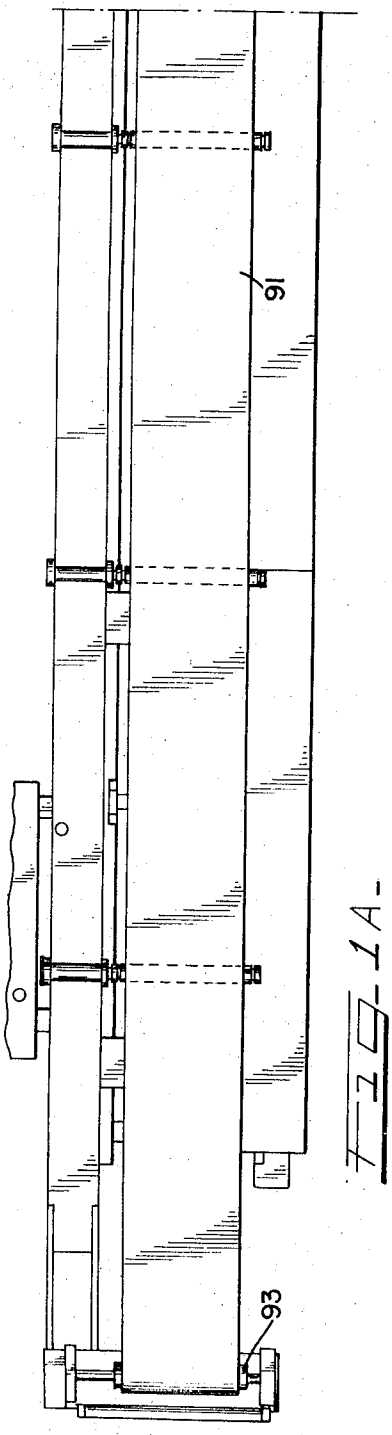


FIG. 1A.

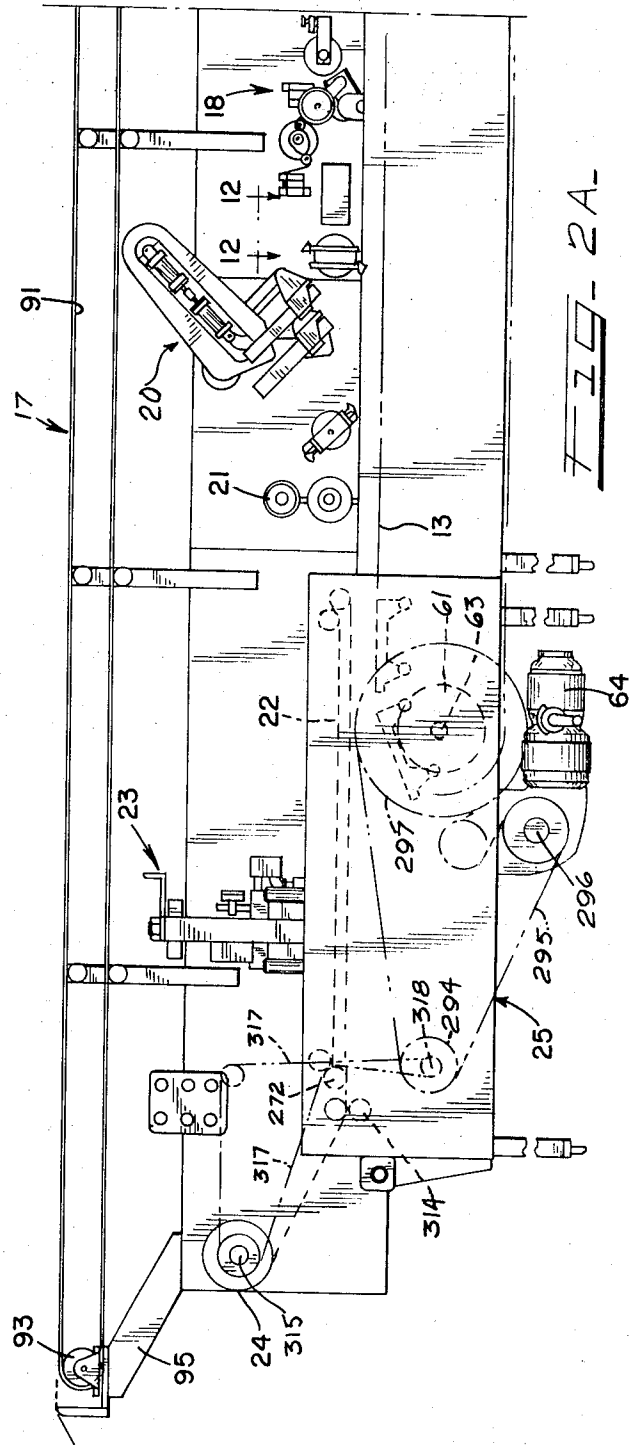


FIG. 2A.

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HANS A. JENSEN
MELVIN M. LAYMAN
BY Greist, Lockwood, Greenawalt & Dorsey
ATT'YS.

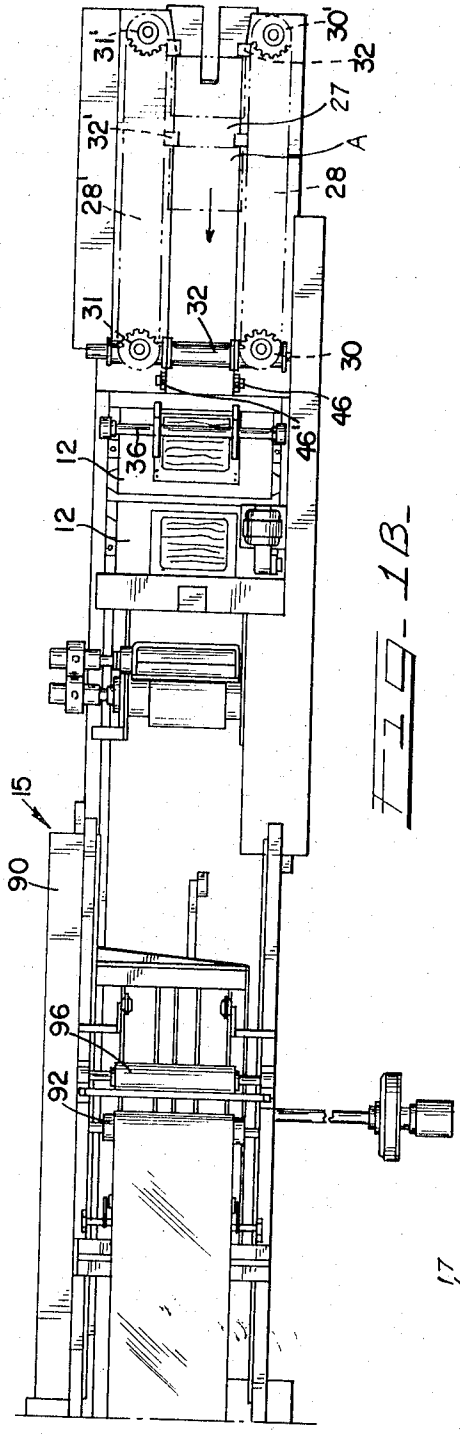

FIG-1B

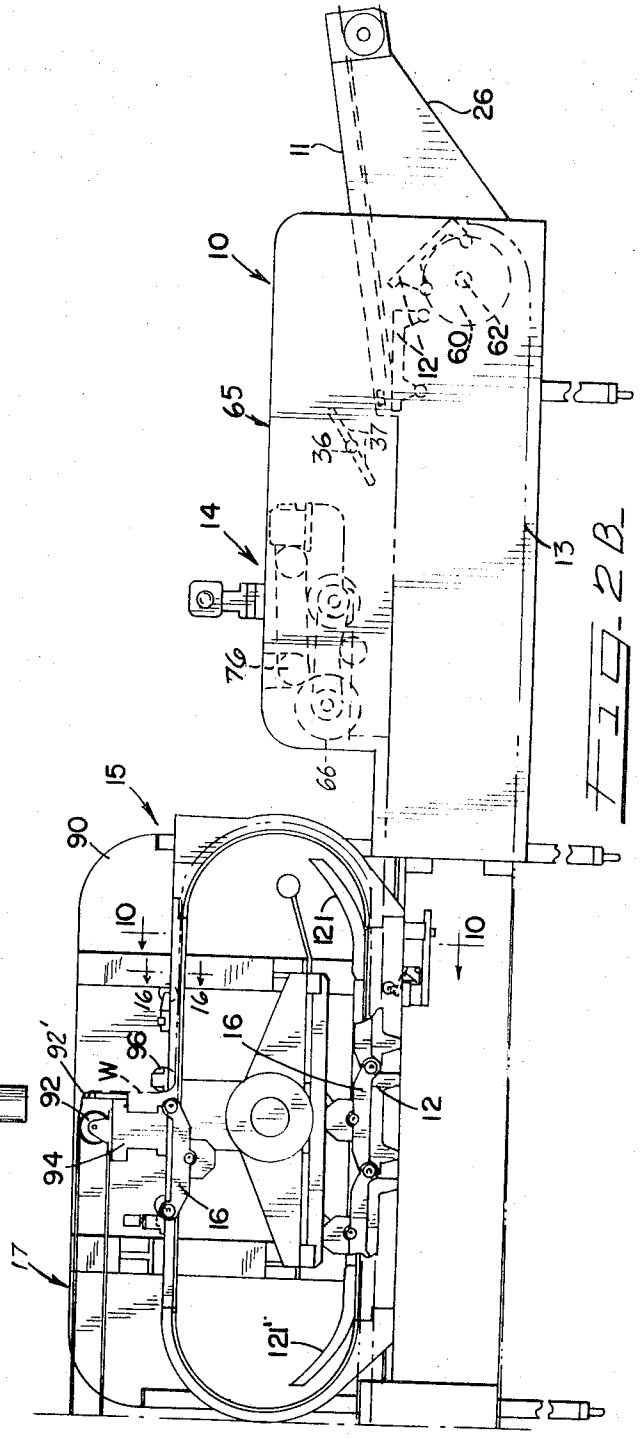

FIG-2B

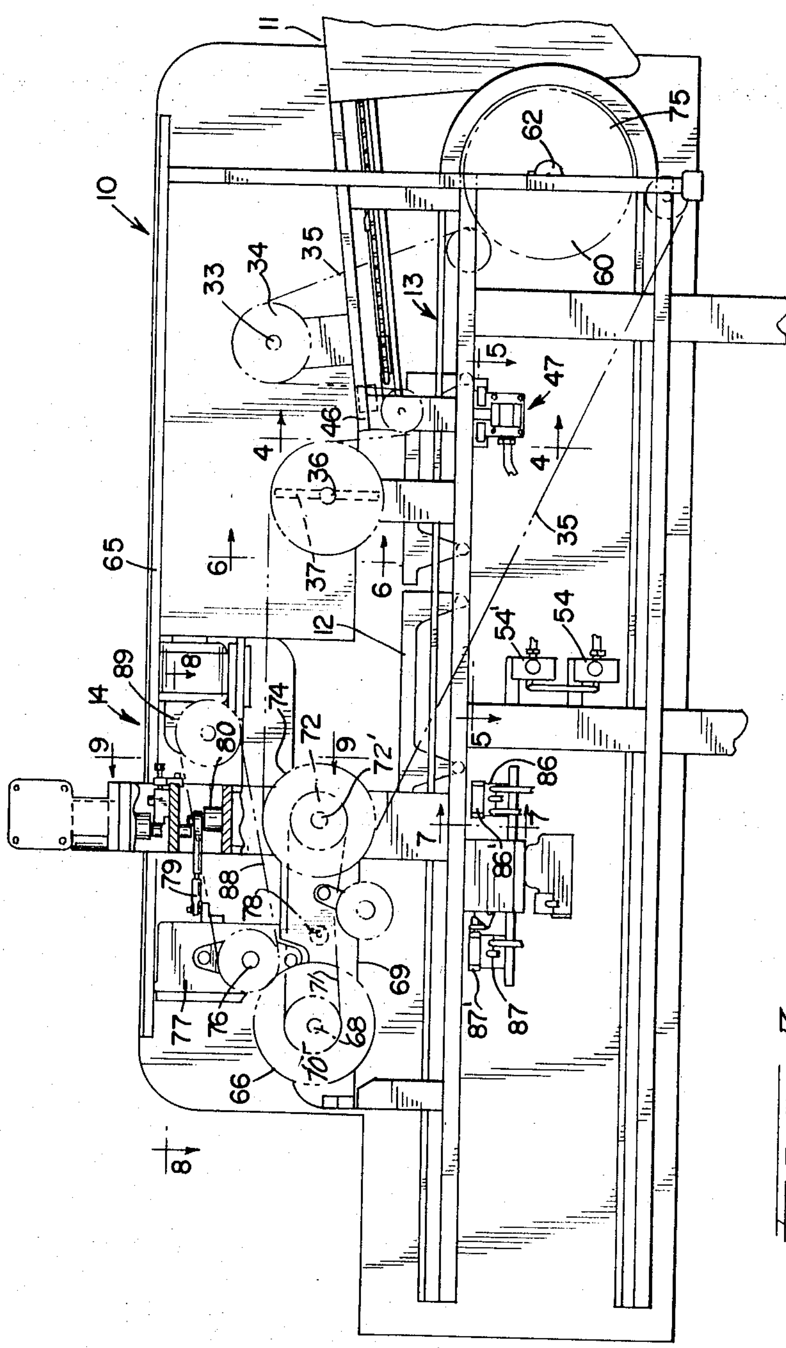
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FIG. 3

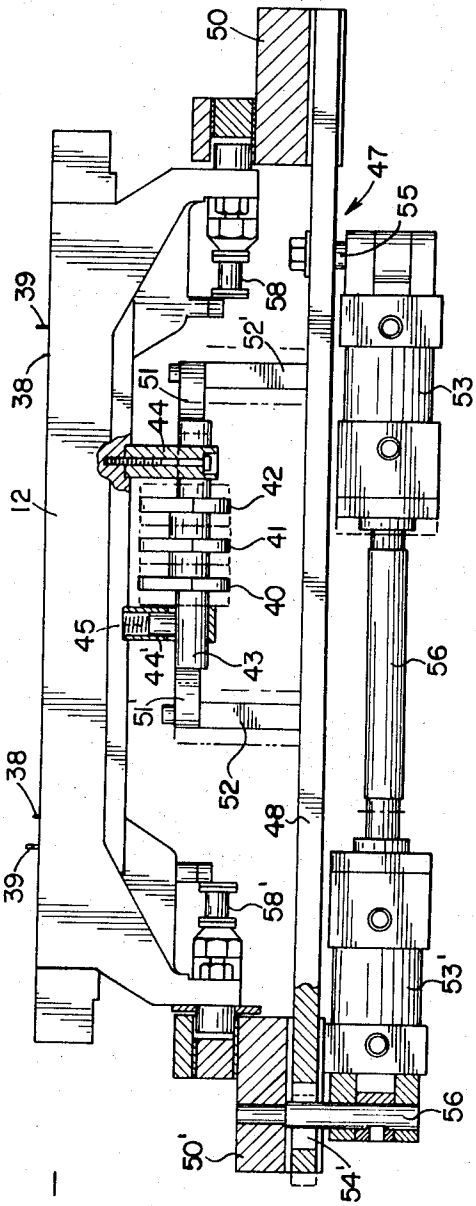
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FIG-4-

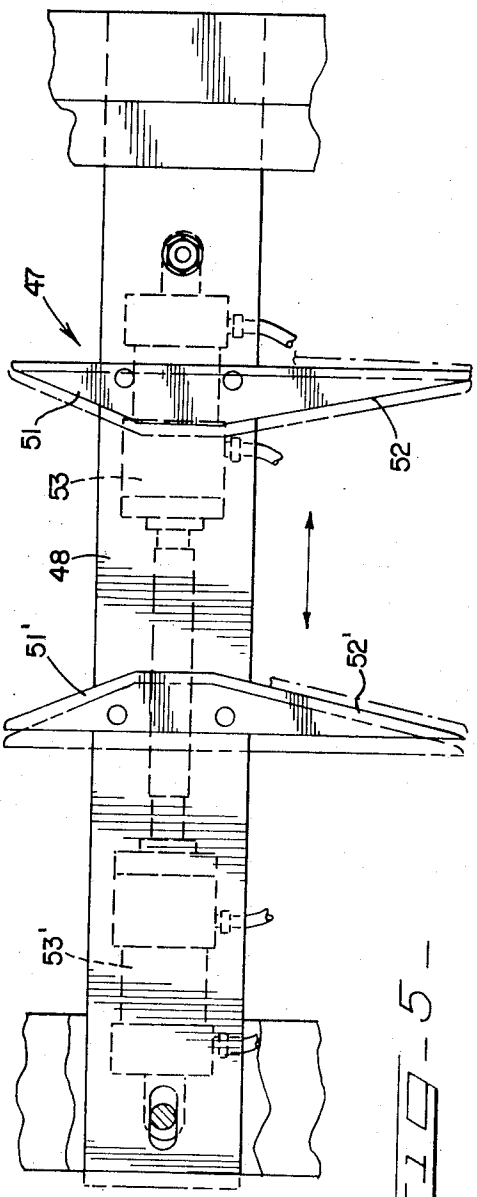
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FIG-5-

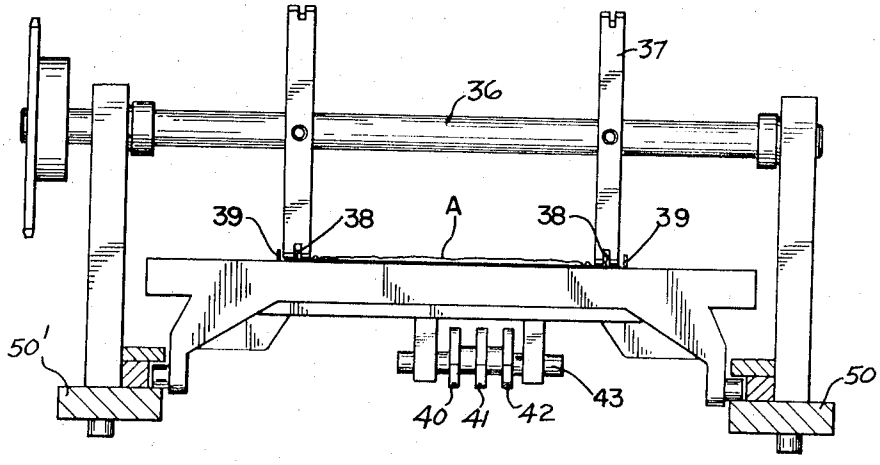


FIG. 6

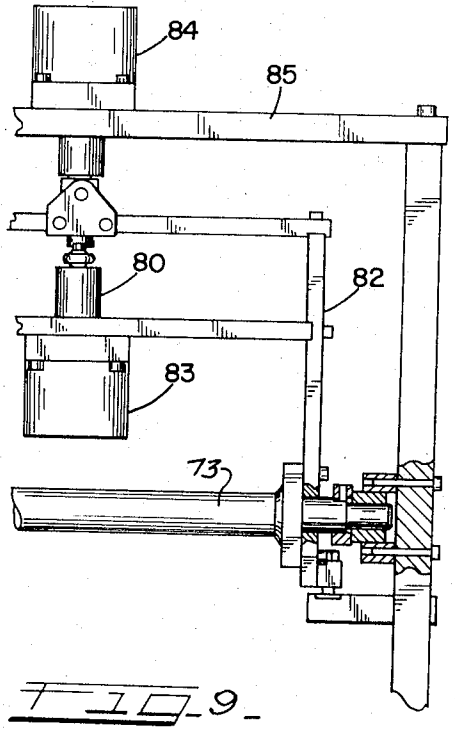


FIG. 9

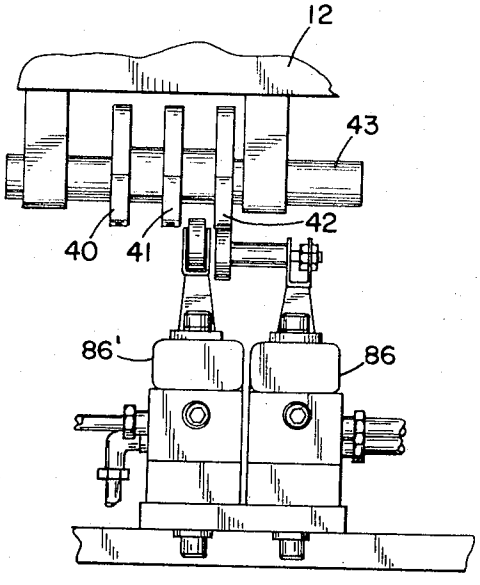
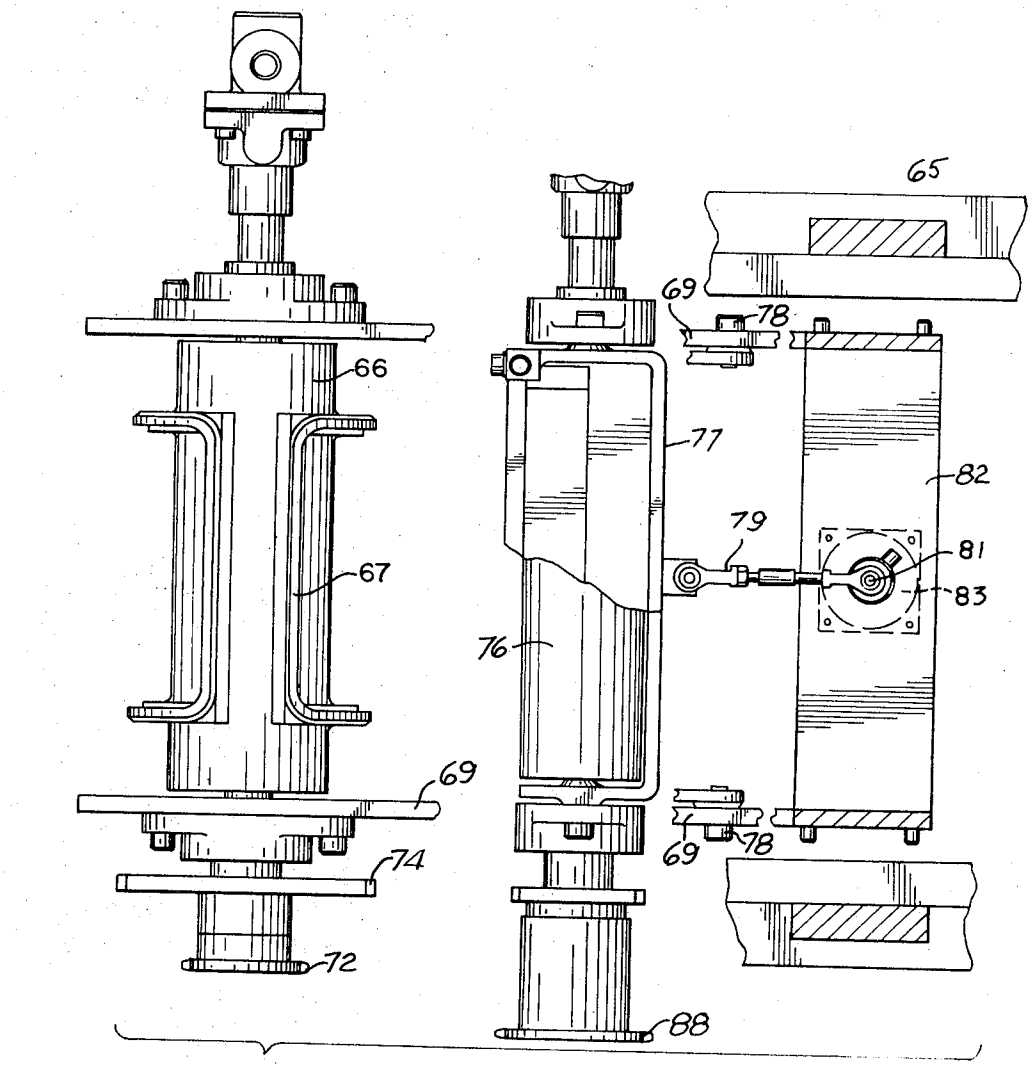


FIG. 7



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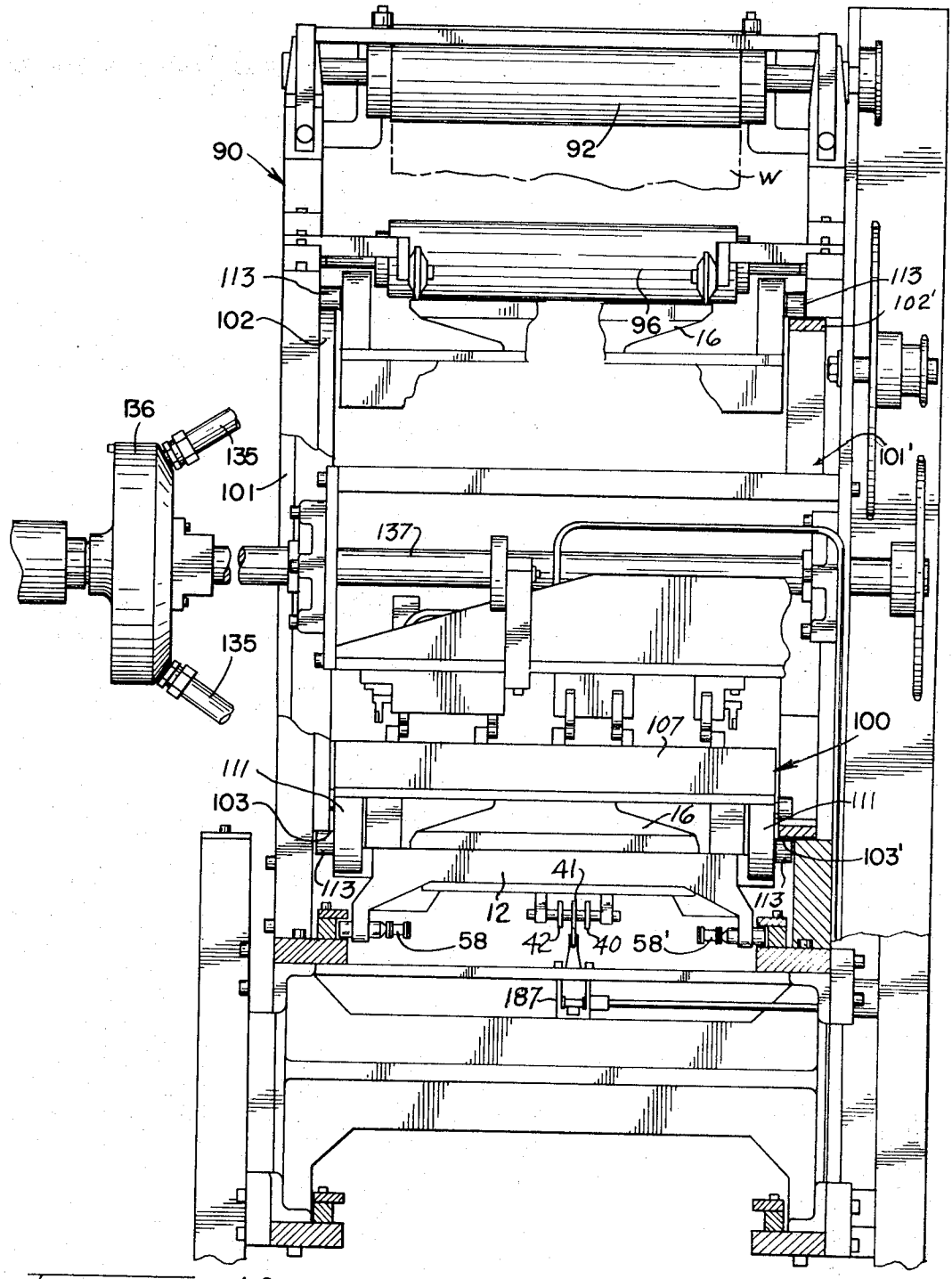
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FIG. 10

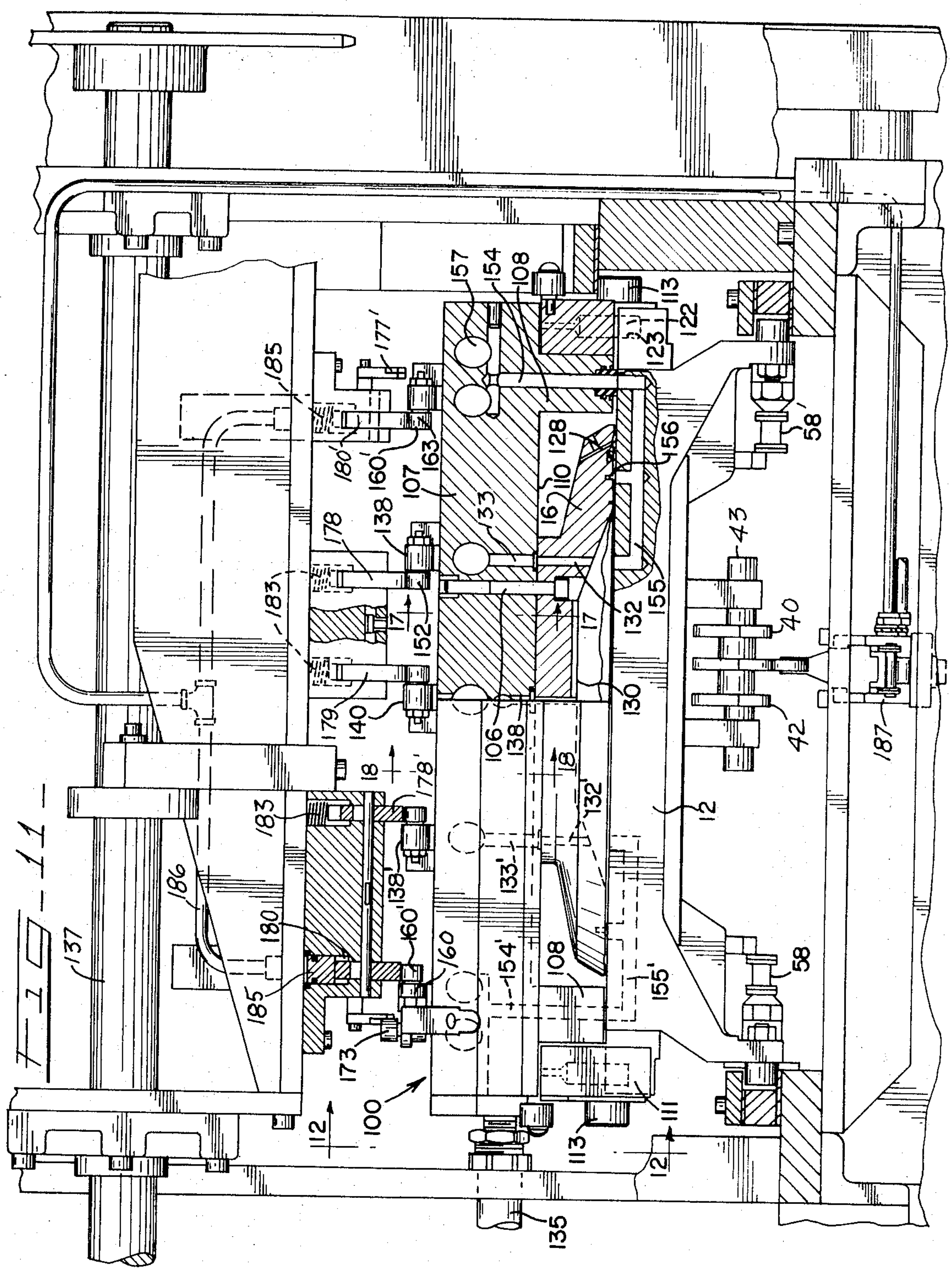


FIG. 11

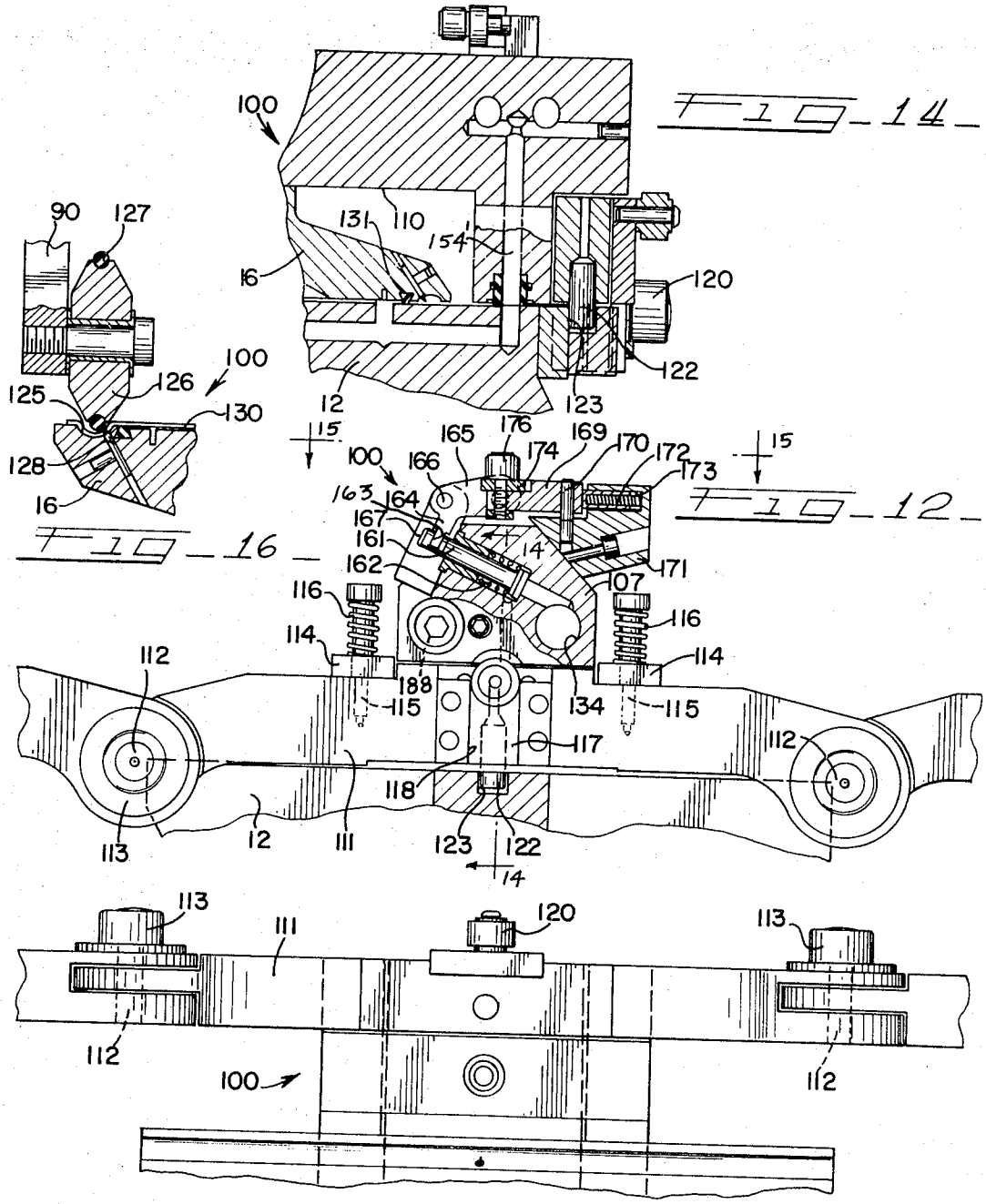
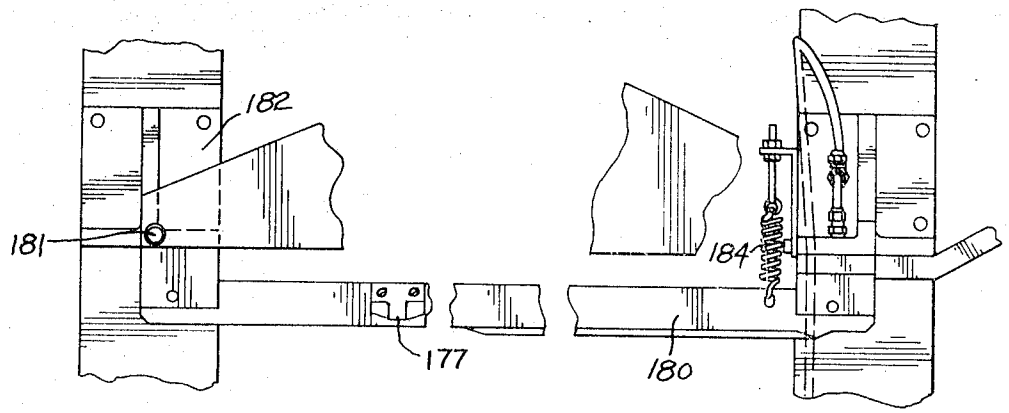


FIG. 14

FIG. 12

FIG. 16

FIG. 13



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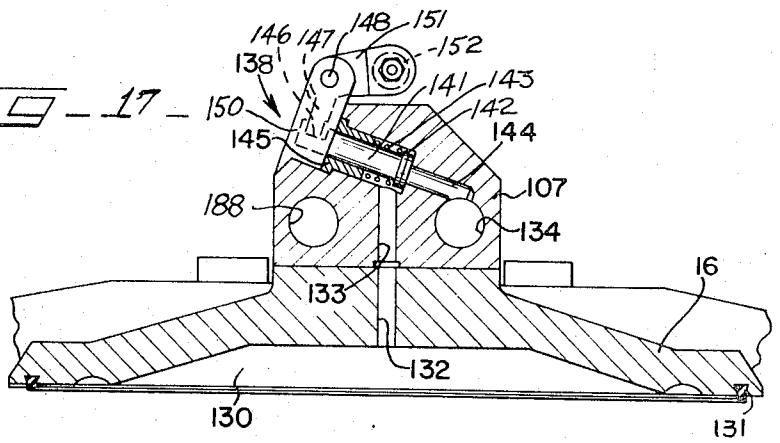
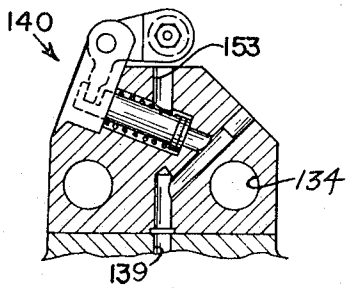


FIG. 17



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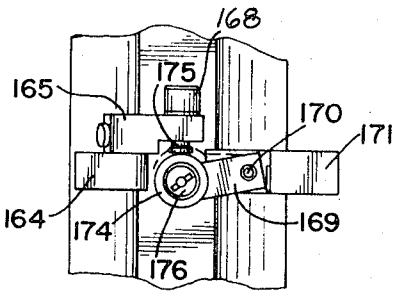

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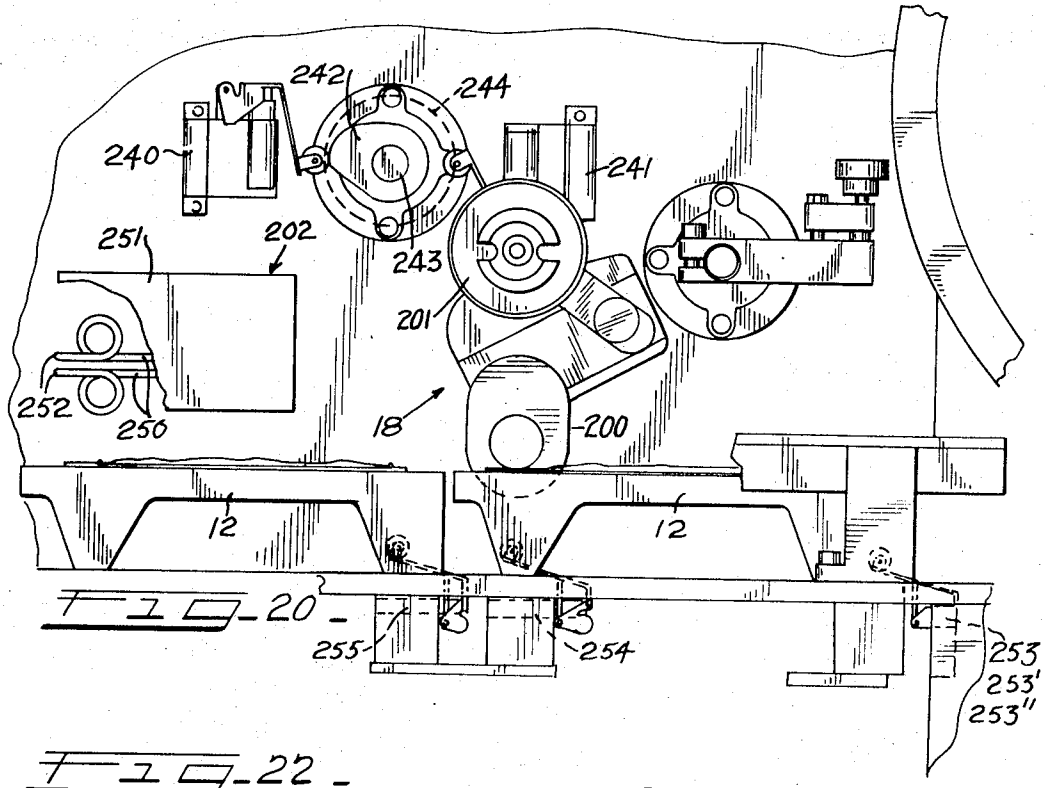
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FIG. 20

FIG. 22

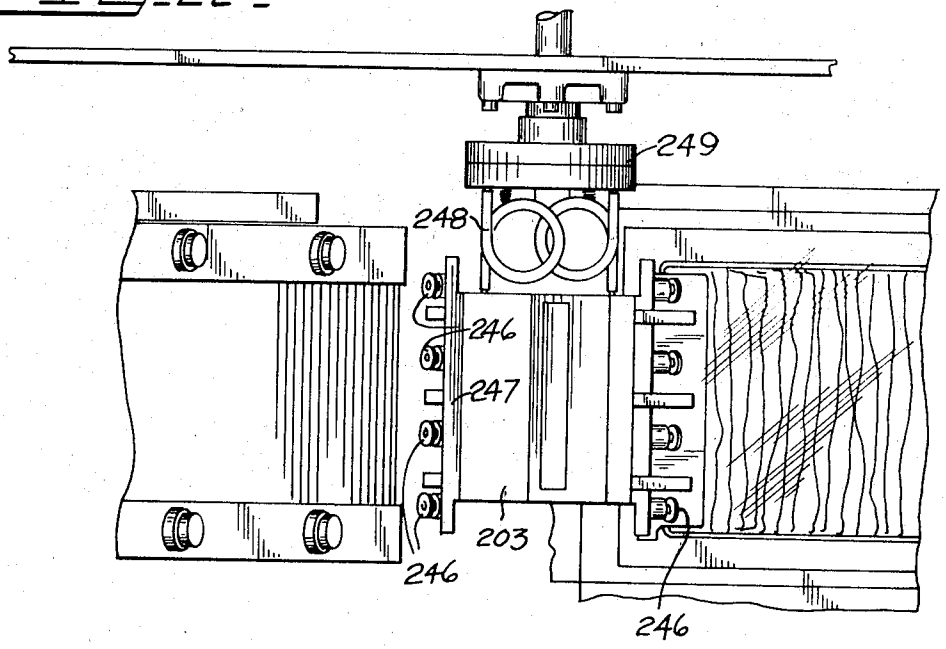
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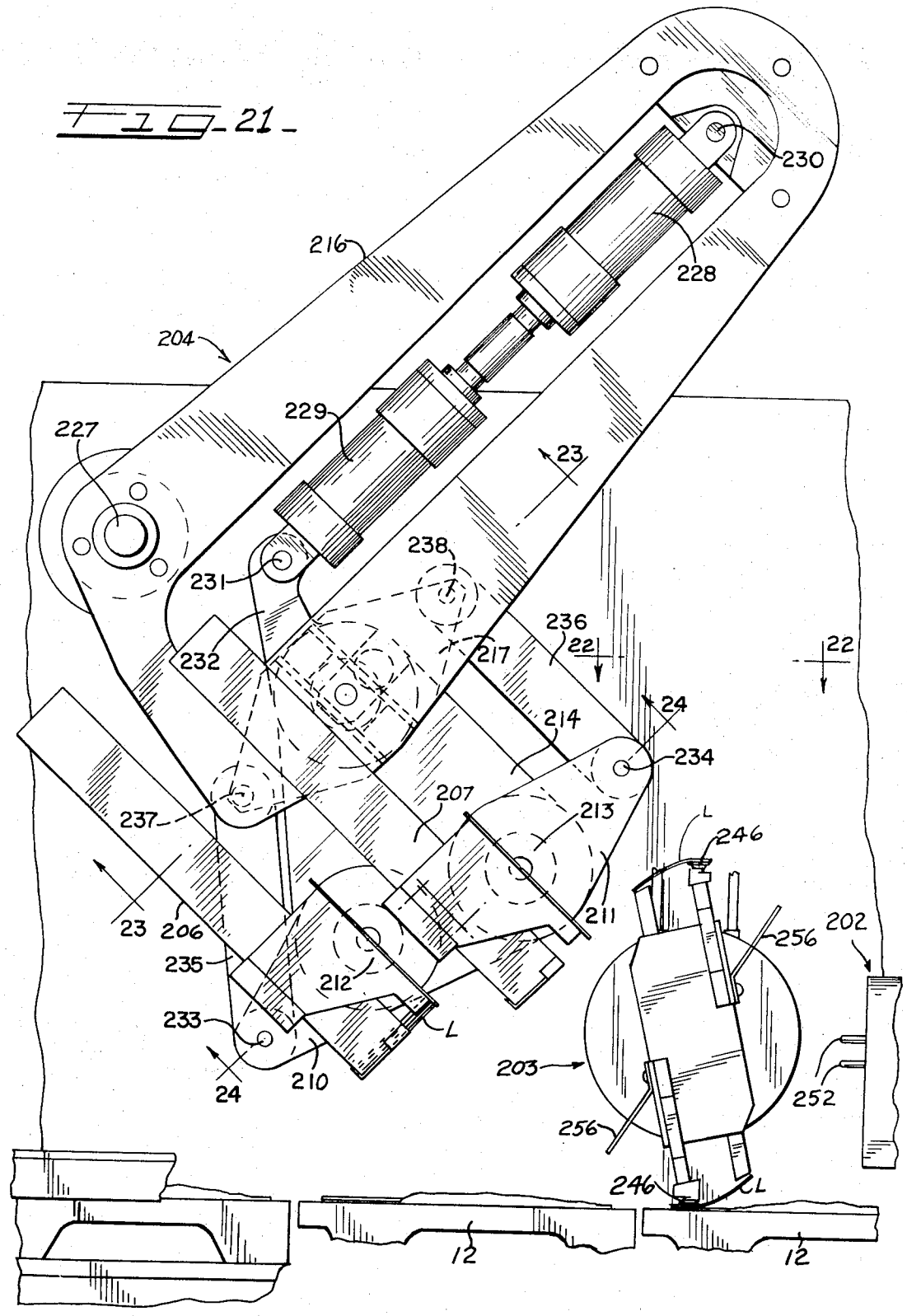
FIG. 21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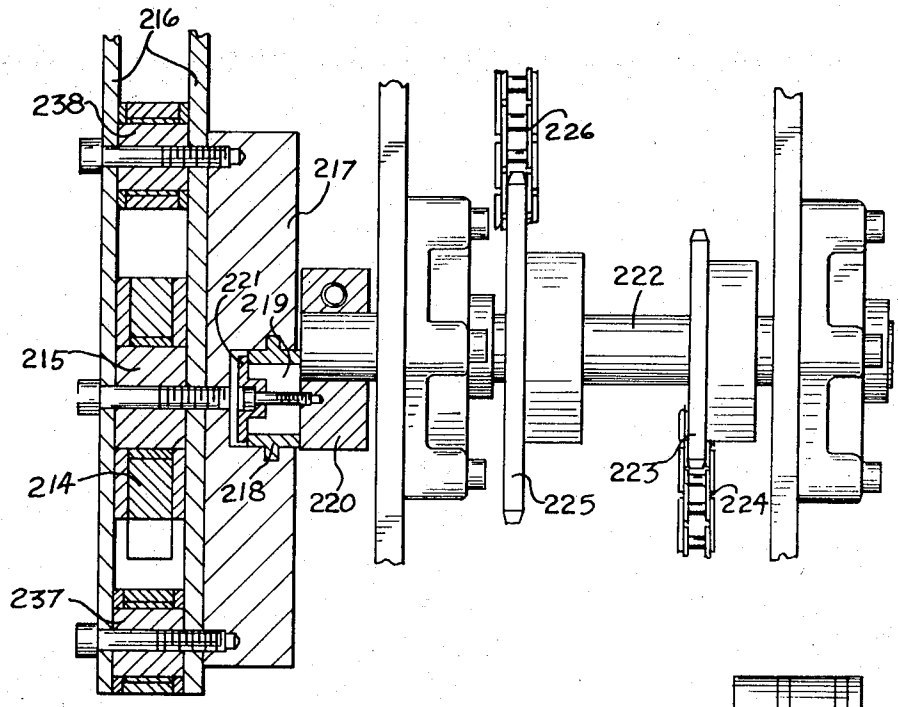
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FIG. 23

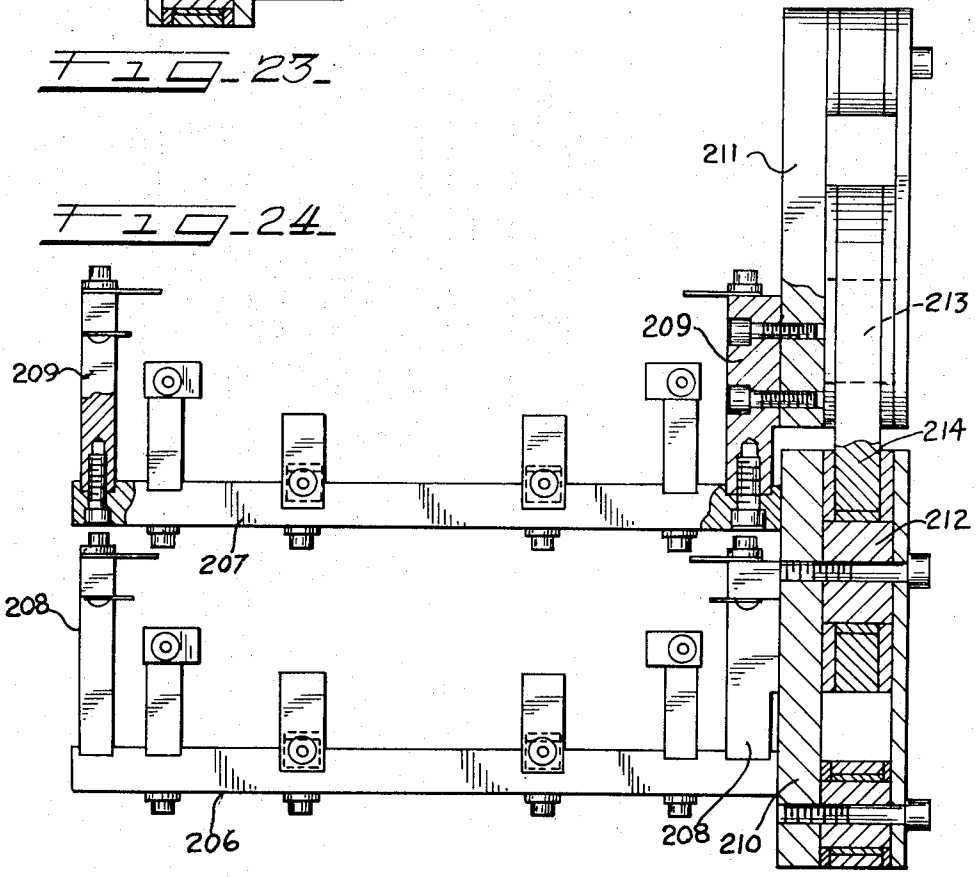
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FIG. 24

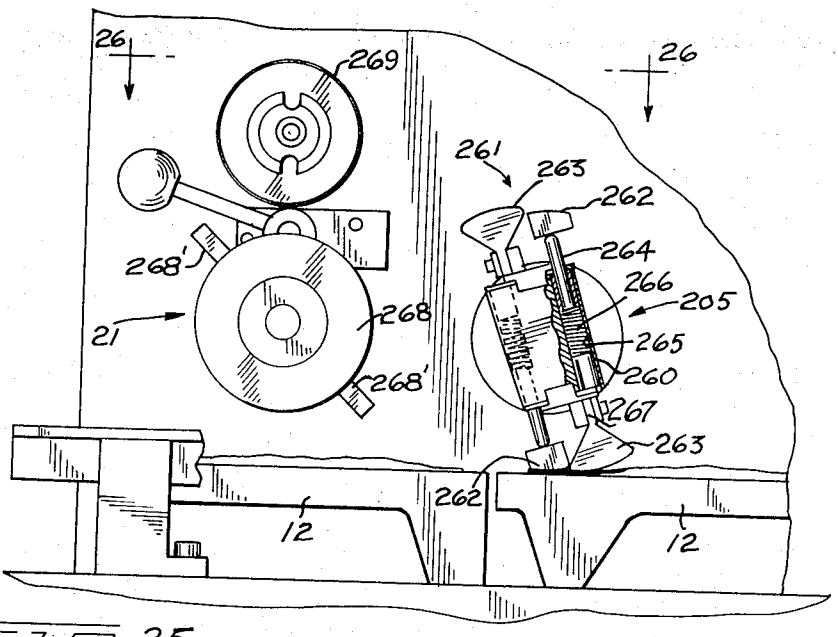
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FIG. 25.

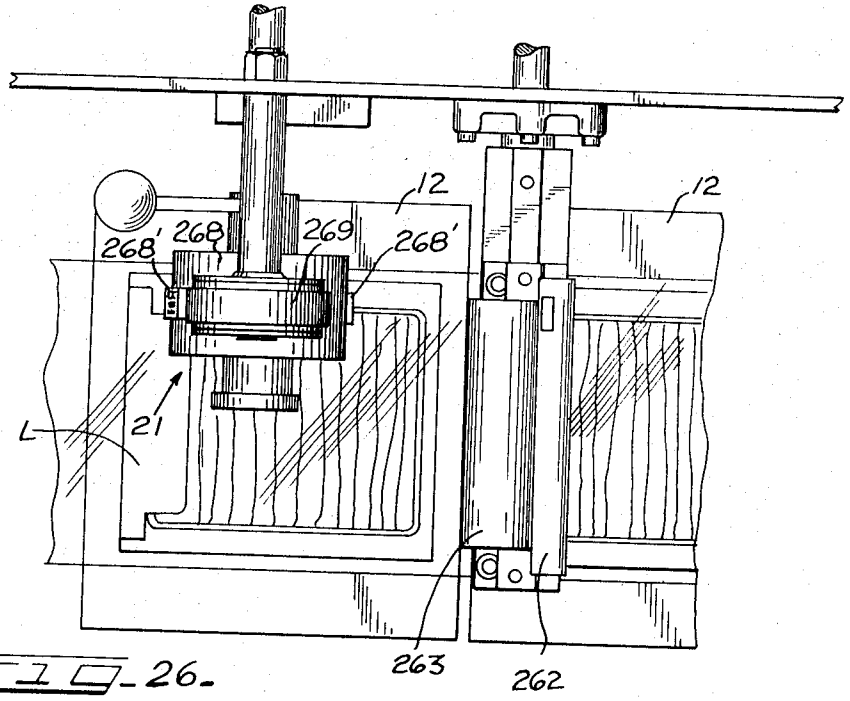
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FIG. 26.

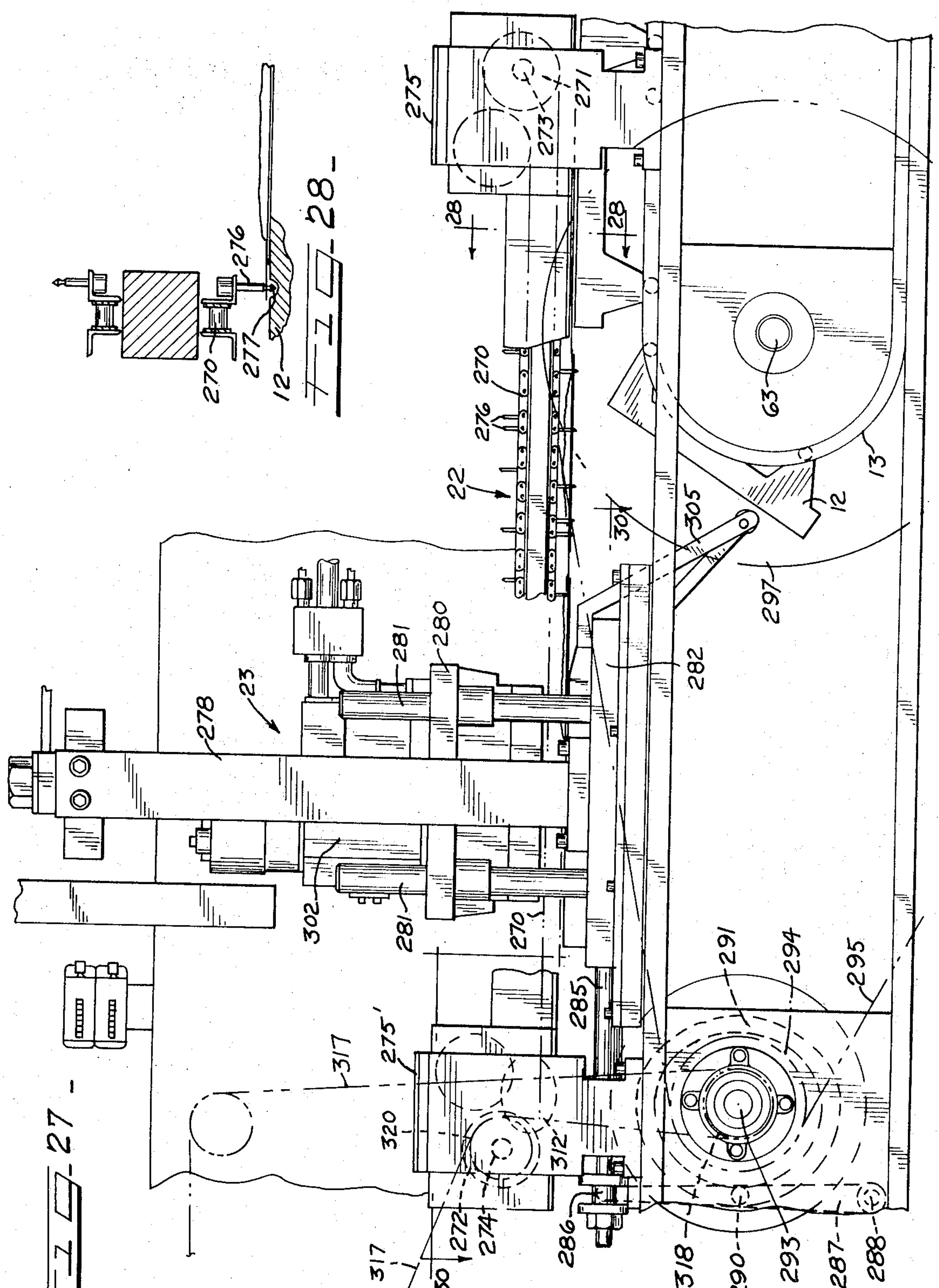
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FIG. 27

FIG. 28

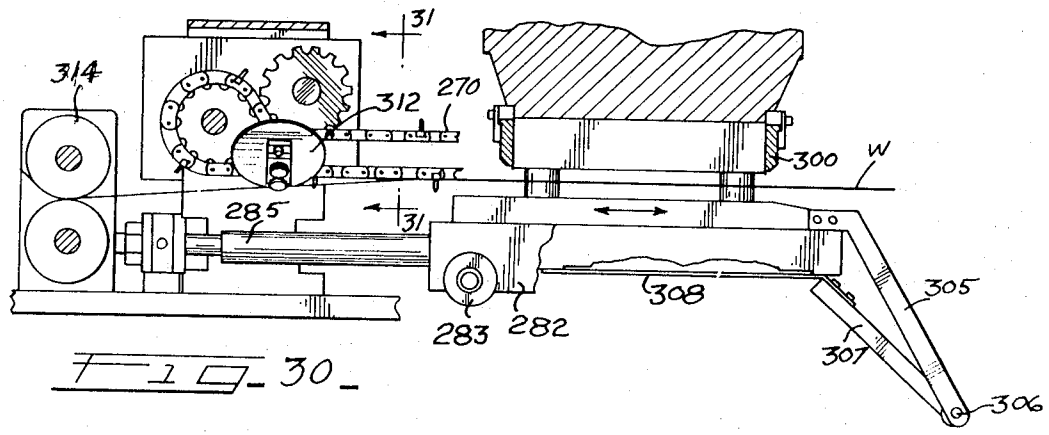

FIG. 30

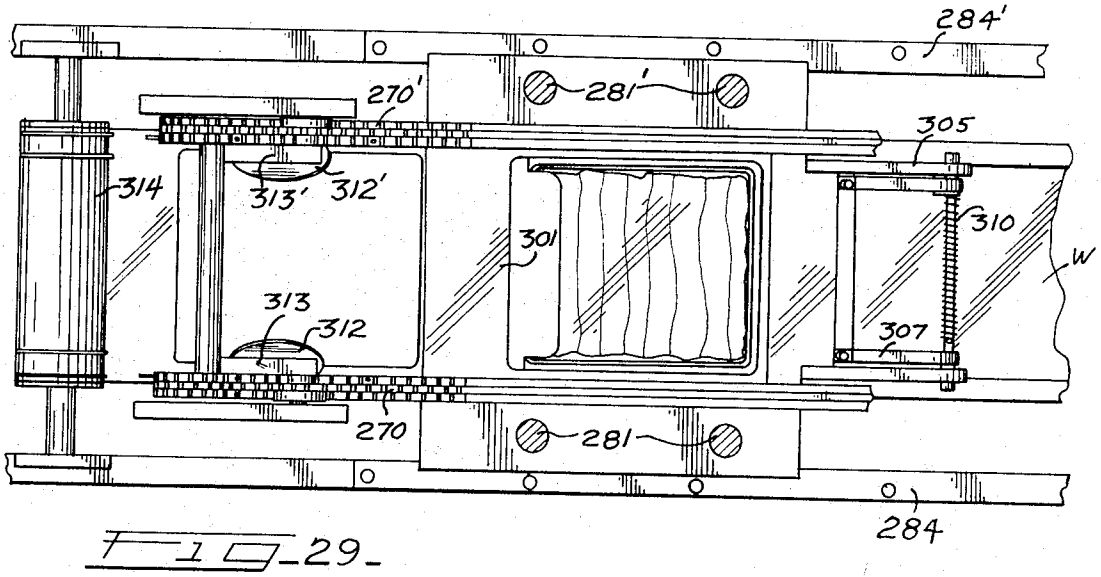

FIG. 29

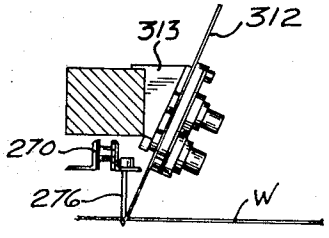

FIG. 31

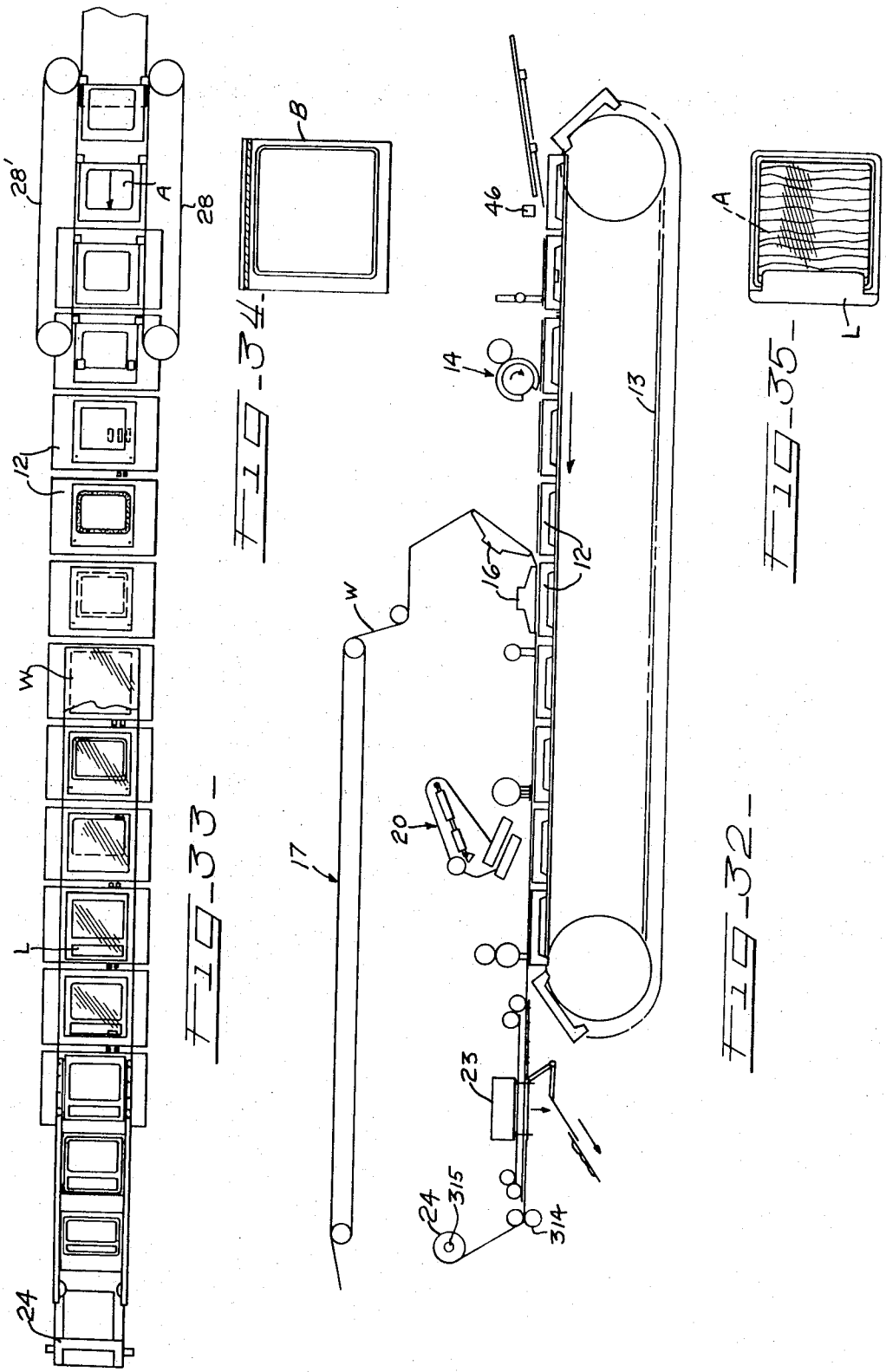

FIG-33-

FIG-34-

FIG-32-

FIG-35-

METHOD OF PACKAGING

This application is a division of our application Ser. No. 16,787, filed Mar. 5, 1970 which issued on Feb. 29, 1972 as U.S. Pat. No. 3,645,065.

This invention relates to a method and apparatus for automatically packaging and labeling products which are advanced on backing boards bearing identifying indicia which is utilized to control the packaging and labeling operations.

In the packaging of certain products such as, for example, sliced bacon or similar products, which may be taken from a supply source in batches of predetermined uniform weight or size but which may be of varying grade or quality, it may be desirable to enclose successive batches of the product in identical packaging materials and place on the packages different labels according to the identifying indicia on the product assemblies. This may, of course, be done by seggregating the product assemblies which are to have the same label applied and packaging and labeling them separately, or by providing for seggregation and separate labeling after the product is enclosed in the packaging elements. These procedures, however, which involve separate lines for the packaging and/or labeling operations do not lend themselves to high speed production. It is a general object, therefore, to provide a system and apparatus for packaging products of the character described which enables all of the packaging and labeling operations to be carried out automatically with provisions for initial product identification and control of the means for accomplishing the package forming operations and selective label application in accordance with the product identification.

It is a more particular object of the invention to provide a method and machine for packaging assemblies of bacon slices, or the like, which assemblies are provided with an identifying means which is employed to control subsequent packaging and label applying operations so as to form uniform packages and apply a label to each package according to the identifying means.

It is another object of the invention to provide a method and machine for packaging a product such as groups of bacon strips or the like which are adapted to receive labels from at least two separate stacks thereof which product assemblies having identifying means thereon are advanced in random order to a packaging area where successive assemblies are enclosed in a packaging material after which a label is automatically drawn from a stack in accordance with the identifying means and pressed onto each package.

It is a further object of the invention to provide a method and machine for packaging a product such as groups of bacon strips or the like which involves product assemblies of different character requiring different labeling wherein the product assemblies are provided with identifiable marking and advanced to a sensing device which identifies the particular assembly and sets up a mechanism for controlling the packaging and labeling operations subsequently carried out so as to automatically apply the proper label to each package according to the marking on the product assembly and to disable certain operations when there is an interruption in the advance of the product assemblies.

It is still another object of the invention to provide a method and a machine for packaging and labeling products or groups of products which are not uniform as to quality or the like and which require the application of different labels for purposes of identification wherein the products or groups of products are provided with an identifying means and advanced to a wrapping and labeling apparatus which includes a sensing device actuated by the identifying means and a mechanism for controlling the operation of the wrapping and labeling devices which is responsive to the sensing device so as to automatically accomplish the wrapping and labeling of the packages in a continuous single line operation at relatively high speed.

A still further object of the invention is to provide a method and apparatus for packaging groups of bacon slices or the like which are initially provided with an identifying means according to grade or other criteria, wherein the package forming groups or assemblies are advanced in random succession to an identifying area where each assembly is identified by a sensing device and fed to a package forming and label applying apparatus and wherein control mechanism is provided for subsequent packaging and labeling operations which is adapted to be set in response to the operation of the sensing device, with the label applying apparatus including a dual stack label magazine and associated mechanism for automatically feeding a label from one of the stacks according to the product grade as determined by the setting of the control mechanism by the sensing device.

A still more specific object of the invention is to provide a method and apparatus for packaging groups or assemblies of bacon slices or similar products wherein the products are initially examined and placed on backing boards which are provided with an identifying means, the backing boards with the products thereon are fed in random order to a package and labeling apparatus in which the backing boards are first advanced through an area where the identification of the board is accomplished by a sensing device which operates to set a series of control cams carried on each of a series of package forming platters on a continuously moving conveyor on which the backing boards are carried past a printer which applies a continuous marginal adhesive pattern to each board as it is advanced to a cooperating package forming, platter carrying conveyor, the platters on the latter laying down a continuous web of covering film over the package assemblies carried on the platters on the first conveyor and mating with the same, with provision for evacuating and sealing the package assemblies, after which the connected packages are advanced past a platter identification printer to a label applying device which includes a dual label magazine and associated mechanism operative under the control of the preset cams to selectively apply labels to the packages, the labeled packages are passed beneath a code dater and transferred to an outfeed conveyor which advances the connected packages beneath a cutting die which is operated to trim each package and release the same from the web with the remaining material in the web being wound on a waste-receiving reel at the end of the machine.

These and other objects and advantages of the invention will be apparent from a consideration of the method and apparatus which is illustrated in the accompanying drawings wherein:

FIGS. 1A and 1B constitute a plan view of a machine for packaging assemblies of bacon slices or similar products which embodies the principal features of the invention;

FIGS. 2A and 2B constitute a side elevation of the packaging machine of FIGS. 1A and 1B, with portions thereof broken away;

FIG. 3 is a side elevational view to a larger scale at the entrance end of the machine as shown in FIG. 2B with the side plates removed and with portions broken away or omitted;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3, to a larger scale, and with portions broken away;

FIG. 5 is a view taken on the line 5—5 of FIG. 3 with portions broken away and to a larger scale;

FIG. 6 is a cross sectional view taken on the line 6—6 of FIG. 3, to a larger scale;

FIG. 7 is a fragmentary cross sectional view taken on the line 7—7 of FIG. 3, to a larger scale;

FIG. 8 is a view taken on the line 8—8 of FIG. 3, to a larger scale and with portions broken away;

FIG. 9 is a fragmentary cross section taken on the line 9—9 of FIG. 8, to a larger scale and with portions broken away;

FIG. 10 is a cross sectional view taken on the line 10—10 of FIG. 2B to a larger scale and with portions broken away;

FIG. 11 is a fragmentary cross section showing a portion of FIG. 10, to a still larger scale;

FIG. 12 is a view taken on the line 12—12 of FIG. 11, to a larger scale;

FIG. 13 is a fragmentary view taken on the line 13—13 of FIG. 12;

FIG. 14 is a fragmentary cross section taken on the line 14—14 of FIG. 12, showing the far side of the apparatus as viewed in FIG. 12;

FIG. 15 is a fragmentary plan view taken on the line 15—15 of FIG. 12;

FIG. 16 is a fragmentary sectional view taken on the line 16—16 of FIG. 2B, to a larger scale;

FIG. 17 is a fragmentary cross section taken on the line 17—17 of FIG. 11, to a larger scale;

FIG. 18 is a fragmentary cross section taken on the line 18—18 of FIG. 11, to a larger scale;

FIG. 19 is a largely elevational view showing a portion of the apparatus in FIG. 2A, to a larger scale and with portions broken away and in section;

FIG. 20 is a side elevational view showing a portion of FIG. 2A to a still larger scale;

FIG. 21 is a side elevation showing another portion of FIG. 2A to a larger scale;

FIG. 22 is a plan view of a portion of the apparatus shown in FIG. 21, the view being taken on the line 22—22 of FIG. 21;

FIG. 23 is a cross section taken on the line 23—23 of FIG. 21;

FIG. 24 is a cross section taken on the line 24—24 of FIG. 21;

FIG. 25 is a side elevation showing a portion of FIG. 2A to a larger scale;

FIG. 26 is a plan view of the apparatus shown in FIG. 25;

FIG. 27 is a partial side elevational view at the outfeed end of the machine, the view being taken with the side plates removed and showing part of the apparatus shown in FIG. 2 to a larger scale;

FIG. 28 is a fragmentary cross section taken on the line 28—28 of FIG. 27, to a still larger scale;

FIG. 29 is a view taken on the line 29—29 of FIG. 27;

FIG. 30 is a view, partly in longitudinal section and partly in side elevation, of the apparatus shown in FIG. 29;

FIG. 31 is a fragmentary sectional view taken on the line 31—31 of FIG. 30, to a larger scale;

FIG. 32 is a side elevational view, largely schematic, showing the packaging and labeling operations which are carried out by the machine illustrated in FIGS. 1 to 30;

FIG. 33 is a plan view, largely schematic, showing the operations illustrated in FIG. 20;

FIG. 34 is a plan view of a packaging board on which the product is supported as it is fed into the machine; and

FIG. 35 is a plan view of the completed package produced with the illustrated method and machine.

The method and apparatus which is illustrated in the drawings is particularly designed for the packaging of assemblies of bacon slices which are advanced on a discharge conveyor from a bacon slicing machine with the assemblies being such as to constitute, for example, a 1 pound package and being subject to visual inspection permitting the assemblies to be judged as to the quality or grade under which they should be marketed. The operator or inspector, in the packaging system illustrated, checks the weight of each assembly of the bacon slices and makes any correction necessary, after which each assembly is placed on a backing board B (FIGS. 33 and 34) which bears on its margin an identifying insignia, the different grades of the product, as determined by the inspector, being placed on backing boards of the same structural character except for grade identification insignia or marking. The product assemblies A with supporting boards B are then advanced to the packaging machine in random order, that is, in no particular order of succession with regard to the identifying indicia on the supporting boards B. The package assemblies A enter the infeed portion 10 (FIGS. 1B, 2B and 3) on a chute-like conveyor assembly 11 which was associated means for identifying the grade indicia on the package assembly as the latter is positioned on a bottom package forming platter 12 advancing on the top run of a lower conveyor 13, each board supporting platter 12 having an associated set of cam plates, the position of which is controlled by operation of a scanning device responsive to the indicia on the backing board B as it passes the same. The cam plates control subsequent operations on the assembly A which is carried on the platter 12. The conveyor 13 advances the platters 12 past an adhesive applicator apparatus, indicated at 14, which prints on the margin of the backing board a continuous adhesive pattern, the adhesive apparatus being inoperative if no backing board is present. The conveyor 13 extends beneath a top conveyor 15 which carries package forming platters 16 adapted to mate with the platters 12 on the lower conveyor 13 and to lay down on the latter a convering web W which is delivered by a web infeed conveyor assembly 17 and guided around the infeed end of the upper packaging conveyor 15. The platters 16 which are carried on the conveyor 15 have associated means for evacuating the packages which are formed between the mating platters and for sealing around the margins of the same. As the conveyor 13 advances the platters 12 beyond the upper platter conveyor 15 the sealed packages are advanced beneath a printing device 18 (FIG. 2A) which applies to the margin of each package numbers, or the

like, for identifying the pair of mating platters between which the particular package has been formed. Further advance of the bottom conveyor moves the packages beneath a label L applying mechanism **20** which is operated in response to the setting of the control cams to apply the proper label to the leading side of each of the packages. The label applying control includes a no-package no-label feature. The packages then pass beneath a code dater **21** and approach the end of the conveyor **13** where they are transferred to a take-off or transfer conveyor **22.** The take-off or discharge conveyor **22** carries the connected packages beneath a cutting or trimming head **23** which is operated to cut the successive packages free of the web, allowing the packages to drop out of the machine while the balance of the web material, which is waste, is released from the conveyor **22** and wound on a collecting reel **24.** The operation of the conveyors is continuous and the control arrangements provide for operation of the different devices in proper timed relation to the advance of the conveyors and in response to the initial setting of the control cams which are positioned according to the indicia on the backing board B so as to omit some of the operations when there is no package assembly delivered to a platter **12** on the conveyor **13** and to apply the proper label to each package formation regardless of the order in which the assemblies A enter the machine.

Referring now to the details of the machine, the entire apparatus is supported on an upright frame **25** with the infeed conveyor assembly **11** extending on an auxiliary frame **26** projecting from the infeed or entrance end of the machine (FIGS. 1B and 2B).

Referring more in detail to the infeed conveyor assembly **11,** there is provided a guide chute **27** (FIG. 1B) in which the product and associated backing board assemblies are advanced to the lower platter conveyor **13** by a pair of side chains **28, 28'** which are carried on end sprockets **30, 30'** and **31, 31'** for operation in a common plane. The chains **28, 28'** are at opposite sides of the chute **27** and have co-operating pusher fingers **32, 32'** which engage the trailing edge of the backing boards B and advance the same to the lower end of the inclined chute **27.** The sprockets **30, 31** are driven by suitable angle drive connection with a cross shaft **33** (FIGS. 1B and 3) having an end sprocket **34** which is driven by chain **35** which is in turn driven by connection with the power drive to the lower platter conveyor **13,** the drive being indicated in FIG. **3.**

At the lower end of the infeed chute **27** there is mounted, on suitable supports, a cross shaft **36** carrying a pair of aligned and axially spaced bars **37,** the ends of which serve to force the boards B down into proper position on the platters **12.** Each of the platters **12** is provided with a pair of board engaging needles or pins **38, 38',** one at each side edge (FIG. **6**) on which the boards B are impaled by the arms **37,** the latter being rotated in proper timed relation with the movement of the platters **12** and the infeed chains **28, 28'** to press the boards down on the impaling pins **38, 38',** the latter being located near the leading edge of each platter **12.** Side guide plates **39, 39'** (FIGS. **6** and **14**) project above the platter surfaces outboard of the pins **38, 38'.**

Each of the platters **12** also carries beneath its board receiving face a series of cam plates **40, 41** and **42** (FIG. **4**) which are mounted on a cross rod or bar **43.** The cam plate supporting bar **43** is carried in aligned slots in the brackets **44, 44',** the latter being spaced apart in the direction laterally of the movement of the conveyor **13.** The bar **43** is slidable in the slots and each of the brackets **44, 44'** is provided with a compression spring **45** which bears on an end portion of the bar **43** and frictionally holds the latter in the position in which it is set. The cam plates **40, 41** and **42** are spaced axially on the bar **43** and the bar **43** is arranged in the brackets **44, 44'** so as to allow for setting at predetermined positions in an axial direction. The positioning of the bar **43** and the associated cams **40, 41** and **42** is determined by electric eye scanning devices **46** and **46'** (FIGS. 1B and **3**) which are mounted at opposite sides of the guide chute **27** and at the lower or discharge end of the infeed assembly **11.** The scanning devices **46** and **46'** are connected through suitable electric circuitry and associated fluid valves for operating a setting mechanism **47** for the cam plate carrying bar **43.** The setting mechanism **47** (FIGS. **3, 4** and **5**) comprises a cross bar or slide plate **48** forming a support with its ends slidably mounted in side frame members **50** and **50'** which constitute part of a guideway for the conveyor **13.** A pair of setting plates **51** and **51'** are mounted for movement in a horizontal plane on brackets **52** and **52'** extending upwardly of the slide plate **48** with the plates **51** and **51'** having tapered edges confront each other and adapted for camming engagement with the ends of the cross rod **43** so that by transverse movement of the slide plate **48** the cross rod **43** may be adjusted to predetermined position in the brackets **44, 44'** and the plates **40, 41** and **42** moved to predetermined position transversely of the platter **12** for subsequent operation of control valves for mechanism along the path thereof, which will be hereinafter described. Dual spaced fluid cylinders **53** and **53'** are mounted beneath the cross bar **48** which are operated by solenoid valves **54, 54'** (FIG. **3**) responsive to the electric eye scanning devices **46, 46'.** The one cylinder **53** is connected to the slide plate **48** by a pin **55** and the other cylinder **53'** is connected to the frame plate **50'** by the pin **56** so that operation of the cylinders **53** and **53'** which are connected by the rod **57** will move the slide plate **48** and the cam bar adjusting plates **51** and **51'** which are carried thereon. The cam carrying bar **43** is adjusted in accordance with the presence or absence of marking on each back board B of the product assemblies A so as to obtain the desired operation of the package forming and labeling mechanisms which are controlled by various valves and switches disposed along the paths of the cam plates **40, 41** and **42** so as to be actuated when the cam plates are in predetermined positions.

The lower platter conveyor **13** extends very nearly the full length of the frame **25.** It comprises laterally spaced chains **58** and **58'** (FIGS. **4, 9** and **10**) on which the platters **12** are mounted with the product receiving face in the outboard direction. The chains **58** and **58'** are supported at opposite ends on pairs of sprockets **60** and **61** with the sprockets of each pair thereof spaced axially on the supporting shafts **62** and **63** which are journaled in the side frame members and with the shaft **63** connectd in driving relation with a motor **64** suitably mounted on the frame **25.**

The adhesive applying apparatus **14** is mounted on suitable sub-framing **65** which extends above the top run of the conveyor **13.** The apparatus **14** is located a short distance beyond the end of the infeed conveyor mechanism **11** and comprises a printing roller **66** (FIGS. **3, 7** and **8**) having a rectangular adhesive apply-

ing pattern member 67 thereon of the configuration required to apply a continuous strip or line of adhesive on the margin of each board B. The adhesive printing roller 66 is mounted on a shaft 68 journaled in a pivotally mounted cross frame 69 and carrying a sprocket 70 which is connected by a chain 71 with a drive sprocket 72 on a stub shaft 72'. The cross frame 69 is pivoted on shaft 73. The shaft 72' carries a sprocket 74 which is driven by the chain 35, the latter being driven by a sprocket 75 on the drive shaft 62, as shown in FIG. 3. Adhesive is supplied to the pattern 67 on the printing roll 66 by an applicator or transfer roll 76 journaled in the bottom of an adhesive supply receptacle 77 which is mounted on the cross frame 69 by a transverse pivot mounting 78. A link bar 70 connects the receptacle 77 to an eccentric 80 which is carried on a vertically disposed shaft 81. Shaft 81 is journaled in an upright portion 82 (FIG. 9) of the cross frame 69 which is operable by a connection with air motor 83 to swing the adhesive receptacle 77 and associated applicator roller 76 about the pivot 78 so as to move the latter into and out of contact with the printing roller 66. An air motor 84 mounted on subframe cross member 85 operates an eccentric to tilt the cross frame 69 so as to move the printing roller 66 into and out of operative position for printing adhesive on the backing boards B which are carried on the platters 12. The air motor 83 is controlled by valves 86, 86' (FIGS. 3 and 7) while motor 84 is controlled by valves 87, 87'. These valves are mounted for actuation by the cam plates 40, 41, 42. The transfer roller 76 is driven by a chain and sprocket connection 88 with a drive motor 89 suitably mounted on the frame 65.

The bottom platter conveyor 13 advances the bottom platters 12 from the adhesive applying mechanism 14 to the package forming zone where the bottom platters 12 mate with the top platters 16 which are carried on the top platter conveyor assembly 15. The platters 16 have a covering web W of suitable packaging film laid on the face thereof as they advance along the top run of the conveyor 15 and are brought into mating relation with the bottom platters 12 at the beginning of the bottom run of conveyor 15. An upright, upwardly extending subframe 90 (FIGS. 2A, 2B and 10) supports the top platter conveyor assembly 15 and its associated mechanism. The subframe 90 also supports the delivery end of the web infeed conveyor apparatus 17. The web infeed conveyor 17 comprises an endless belt 91 supported on end rollers 92 and 93 which are journaled in suitable bearing members on frame brackets 94 and 95 with appropriate intermediate supports as shown in FIG. 2A. The web W is advanced over the end of the belt 91 over roller 92' and beneath a guide roller 96 which is journaled in suitable bearings on frame 90 above the top run of the platter conveyor 15. The web W is slid down on the face of successive platters 16 as hereinafter described.

The upper platter conveyor assembly 15 (FIGS. 1B, 2B and 10 to 14) comprises a series of articulated platter assemblies 100 supported on the subframe 90. The subframe 90 has laterally spaced, parallel, vertically disposed frames 101, 101' on the oppositely disposed inner faces of which there are mounted track forming members having straight upper and lower sections 102, 102' and 103, 103' which are connected by curved end sections 104, 104' and 105, 105' on which the articulated assemblies 100 are carried. Each platter assembly 100 comprises a platter forming member 16 secured by bolts 106 to the inner face of an elongate support forming body member 107 which extends transversely of the path of movement thereof and which has integral end members 108 and 108' forming between them a recess 110 in which the platter 16 is mounted. Each platter assembly 100 includes a pair of end plates 111, 111' which are in the form of links with opposite ends connected to the corresponding ends of the link forming members of the adjoining assemblies 100 by pivot pins 112 on the outer ends of which are carried cam rollers 113 for guiding the assemblies on the supporting tracks. Each body member 107 and its associated platter 16 is connected to the end plates 111 and 111' by a pair of parallel cross bars 114 extending along opposite sides at the bottom of the body member 107 and bolted or otherwise secured to the end members 108 and 108'. The cross bars 114 are each extended to the end plates 111 and 111' and secured thereon by headed bolts 115 which extend through suitable apertures to a point above the top edge of the plates 111 and 111' and carry springs 116 so that a resilient connection is formed with the body 107 and the associated platter 16, enabling tilting movement of the platter 16 relative to the end plates 111 and 111' when the leading edge is approaching the beginning of the bottom path where the platter 16 mates with a platter 12 on the bottom conveyor 13. A slide plate 117 rides in a guideway 118 on the outside face of each of the end plates 111 and 111' and carries a cam roller 130 which is adapted to ride on the cam members 121 and 121' (FIG. 2B) at the entrance and exit ends of the lower path of the platter 16 so as to raise the body member 107 and avoid edge contact of the platter 16 with the mating platter 12. Each of the end plates 111 and 111' carries a pin 122 which projects beyond the inboard face thereof and which is adapted to seat in a bore 123 in the lower platter 12 as the platters 12 and 16 are brought into mating relation so as to properly register the mating platters 12 and 16 with each other.

The web W is laid down on the working face of each platter 16 as the latter approaches the end of the top run of the conveyor 15 by the guide roller 96 and marginal portions of the web are forced into grooves 125 (FIG. 16) extending along the side margins of the face of each platter by a pair of wheel members 126 each having a resilient gasket or tire 127 for forcing the web W into the groove 125. The wheel members 126 are suitably mounted on the frame 90. The platter 16 has one or more pins 128 extending into the groove 125 on the pointed ends of which the web W is impaled. The platter 16 is recessed or dished at 130 (FIG. 11) on its working face to accommodate the thickness of the product and a resilient sealing gasket 131 extends about the margins of the platter.

The recess 130 in the working face of the platter 16 is adapted to be connected to a vacuum source permitting suction to be applied to draw the covering web into the recess 130. A pair of vacuum passageways, indicated at 132 and 132' (FIG. 11) are provided which are in communication, through the passageways 133 and 133' (FIG. 11), with a bore 134 (FIG. 12) in the platter supporting member 107. The bore 134 is connected at one end to a conduit 135 (FIGS. 10 and 11) leading to a manifold 136 which in turn is connected to a suitable vacuum pump or supply line. The portion of the manifold 136 to which the conduits 135 are connected is

mounted for rotation on the shaft **137** so that the conduits **135** may move with the associated platter assemblies. The vacuum supply arrangement may be the same as shown in packaging machine described in U.S. Pat. No. 3,290,858 to which reference may be had for details not fully shown and described herein. The passageways **133** and **133'** are connected to the bore **134** through identical control valve assemblies **138** and **138'** (FIG. **17**) while a center venting passageway **139** for the recess **130** is controlled by a like control valve assembly **140** (FIG. **18**). The valve assembly **138** (FIG. **17**) comprises a valve piston **141**, operative in bore **142**, which is pressed into position by spring **143** to close the smaller bore **144** which extends from bore **134**. The piston **141** slides in sleeve **145** and its outer end is slotted at **146** to receive the end of the arm **147** of the L-shaped operator which is pivoted at **148** on a mounting bracket **150** with its other arm **151** carrying a cam roller **152**. Retraction of the piston **141** against the force of the spring **143** connects the passageway **132, 133** with the bore **134**. The venting valve **140** (FIG. **18**) is of like construction and connects the passageway **139** with the passageway **153** when retracted so as to vent the recess **130** to the atmosphere.

Vacuum passageways **154** and **154'** are provided in the upper platter body **107** and extend through the end portions **108, 108'** for connected with branched passageways **155, 155'** in the bottom platter **12**. One branch of each of these passageways **155, 155'** opens into the recess **130** while the other branch opens beneath the upstanding side strip or fence **39** in the side margin of the bottom platter face over which the web W is draped so as to evacuate all around the package which is being formed. The vacuum passageways **154** and **154'** are connected to the bore **134** through passageways **157, 157'** which lead to identical valve assemblies **160, 160'** (FIG. **11**). The valve assembly **160** (FIG. **12**), which is like valve assembly **140** except for a cocking feature, has a sliding piston **161** pressed toward closed position by spring **162** and having a slot **163** in the outer end for receiving the end of an arm **164** of bell crank **165** which is pivoted at **166** on mounting block **167** and carries cam roller **168**. A device for cocking the normally unlatched valve **160** is provided which is shown in closed position in FIGS. **12** and **15** and comprises an arm member **169** pivotally mounted on a pin **170** set in a mounting block **171** and biased by a spring pressed plunger **172** operative in a recess **173** in the block **171**. The arm member **169** carries a locking washer **174** for engaging over the projecting end **175** of the pivot pin for the cam roller **168** when the latter is depressed to slide valve piston **161** to open position. A cam roller **176** projects above the top face of the locking washer **174** which is adapted to swing the arm **169** counterclockwise about pivot **170** in FIG. **15** when engaged by a cocking cam **177** (FIGS. **11** and **19**).

The valves **138,138', 140, 160** and **160'** are actuated by elongate cam rails or plates **178, 178', 179, 180** and **180'** which are pivoted at **181** on a cross frame member **182** (FIG. **19**) and extend above the path of the platter assemblies along the lower run thereof. These cam rails are mounted for sliding vertical movement on suitable brackets at the entrance end of the lower run and rails **178, 178'** and **179** are normally depressed by springs **183**. Cam rails **180** and **180'** are each normally held in the upper position by a tension spring **184** (FIG. **19**) and depressed to open position by a piston **185** which is operated by air line **186** extending from a control valve **187** which is in turn actuated by the control cam plate **41** when no package assembly is present on the lower platter **12**. This cuts off the vacuum when no product assembly is present. The platter body **107** may have a further bore, indicated at **188** in FIG. **12**, for feeding an inert gas into the package through passageways **154, 154'** prior to sealing, in the same manner as disclosed in U.S. Pat. No. 3,290,858.

The platters **12** and **16** are numbered or otherwise marked for identification and a printing mechanism **18** is disposed immediately beyond the top platter conveyor assembly **15**, which comprises a pair of printing die carrying members **200** and associated inking wheel means **201** with mechanism for operating the printing die wheels to apply to each finished package identifying numbers or marks for the particular pair of platters **12** and **16** between which the package has been formed so that in the event there is a malfunction of the package forming platter assemblies the particular platter assemblies can be immediately identified and replaced or repaired with a minimum delay. Since this apparatus is not essential to the operation of the other elements of the machine but is merely a convenience in the operation and maintenance of the apparatus, it is not further described.

The lower conveyor **13** advances from the package forming area to a label applying area or zone in which the label applying mechanism **20** is located. As viewed in FIG. **2A**, the label applying apparatus **20** comprises a heater mechanism **202** for activating adhesive on the labels, a pick-off or label applying wheel **203**, a label supply magazine **204**, and a label pressing device **205**. The magazine assembly **204** (FIGS. **21, 23** and **24**) comprises two stack holders **206** and **207** each of which is adapted to receive a stack of labels for feeding from the bottom of the holders by the pick-off wheel **203**. The label holders **206** and **207** are bolted to bracket forming blocks **208** and **209** (FIGS. **21** and **23**) which are in turn bolted to arms **210** and **211**. Arms **210** and **211** are pivoted at **212** and **213** to a link plate **214** which is of generally triangular shape. The link plate **214** is pivoted at **215** (FIG. **23**) to a rectangular frame **216** formed by parallel spaced plates. The frame **216** has secured on its back face a slide guide **217** in which a slide member **218** operates. The slide member **218** is held on the pivot **219** of a small eccentric or crank arm **220** by a screw retained washer **221**. The crank arm **220** is mounted on a shaft **222** journaled in the main frame of the machine and driven by sprocket **223** which is connected by a chain **224** to the main drive of the machine. Rotation of shaft **222** imparts an up and down movement to the slide member **218** in the guide **217**. The shaft **222** carries a sprocket **225** which drives the rotating members of the web infeed mechanism **17** and the package closing apparatus through chain **226**. The chain **226** also drives a label air control mechanism hereinafter referred to. The frame **216** is mounted on a pivot shaft at **227** and carries a pair of air cylinders **228** and **229**, arranged in tandem, with a pivot connection at one end to the frame **216** at **230** and having the other end pivoted at **231** to the arm **232** extending from the link plate **214**. The magazine supporting arms **210** and **211** have their outer ends pivotally connected at **233** and **234** to the ends of link bars **235** and **236** and the latter having their other ends pivotally connected

at 237 and 238 to the frame assembly 216. The cylinders 228 and 229 are controlled by cam operated air valves 253, 253', 253'' (FIG. 20). The air cylinders 228 and 229 are operated to swing the label holders 206 and 207, with parallel motion due to the linkage arrangement, to the proper one of three positions as determined by the setting of the cam plates 40, 41 and 42 so as to feed either one or the other of the two labels from stack holders 206 and 207 or to position the holders in an intermediate non-feeding relation relative to the pick-off wheel 203. The rotation of the shaft 222 through the crank 220 and slide 218 gives the whole magazine assembly an elliptical four motion movement. The assembly swings about pivot 227 and the magazine or label holding portion moves down and follows the pick-off wheel 203 permitting the bottom label to be picked off or out of the stack by suction cups 246, when the apparatus has been positioned for feeding from one of the stack holders.

Label pick-off wheel 203 is mounted in position for picking off the bottom label of a stack from one of the magazines 206 or 207 when the latter are swung into label feeding relation relative to the wheel 203. The pick-off wheel 203 carries a series of vacuum cups 246 on oppositely disposed bracket arms 247 which extend in a generally radial direction with the vacuum cups 246 being connected by conduits 248 (FIG. 22) to a manifold 249 having a connection with a vacuum source. The labels L are supplied with heat activatable adhesive which is activated as the wheel 203 turns and carries the back or adhesive coated face of the label past the heater 202. The heater 202 comprises a pair of hot air pipe sections 250 enclosed in a housing 251 with parallel perforated pipe sections 252 projecting from an open side which faces the wheel 203. The valves 240 and 241 are actuated by a cam 242 on a shaft 243 carrying a sprocket 244 which is driven by a chain connection 226 with the sprocket 225 on the shaft 222. The valves 240 and 241 (FIG. 20) are actuated by a cam 242 on a shaft 243 carrying a sprocket 244 which is driven by a chain connection 226 with the sprocket 225 on the shaft 222. The valves 254 and 255 (FIG. 20) are mounted in the paths of cam plates 40, 41, 42. These four valves 240, 241, 254, 255 control the timing of the hot air blast that activates the label adhesive as the label passes the hot air pipes 252. If no label is present the valves shift the air blast 90° out of time. This prevents the vacuum cups 246 from burning up when no label is present. It also puts a constant load on the heater to help maintain a constant air temperature. Shield members 256 carried on the pick-off wheel 203 protect the vacuum cups 246 from the hot air blown from pipe sections 252 when they are in the non-feeding and label applying positions (FIG. 22). The pipes 250 are connected to a suitable source of hot air.

The presser wheel 205 (FIGS. 25 and 26) comprises a supporting hub 260 having two pairs of label pressing members 261 which extend in oppositely disposed, generally radial directions for engaging the labels as the hub 260 rotates. Each pair of pressing members 261 comprises a relatively hard pad member 262 and a softer pad member 263. The pad member 262 which may be of hard rubber, for example, extends across the hub 260 and is mounted on a plurality of cylindrical rods or stems 264 which slide in bores 265 and which are pressed by the compression springs 266 towards an outermost position. The softer pad member 263 which may be foam rubber, for example, is mounted on a fixed bracket 267. It is of generally triangular cross section and extends across the hub 260 having a length slightly greater than the length of the label. The pad 262 presses down the leading portion of the label, as viewed in FIGS. 25 and 26, and the softer pad wipes down the trailing portion which extends over and laps the product.

The code dater 21 comprises a hub 268 carrying a pair of type holders 268' for receiving appropriate type or other marking elements and an associated inking wheel 269. The code dater is driven in timed relation to the movement of the platters 12 so as to apply the required marking to each of the packages on the successive platters.

As the conveyor 13 carrying the platters 12 moves beyond the code dater 21 the package assemblies which are carried on the platters 12 are transferred to the conveyor 22 for travel beneath the die cutting device 23 which cuts the individual packages free of the web. The transfer conveyor 22 comprises a pair of laterally spaced chains 270 and 270' (FIGS. 2A, 27 to 30) which are mounted on pairs of end sprockets 271 and 272 carried on shafts 273 and 274 which are journaled in brackets 275 and 275' upstanding from the main section of the frame 25. The chains 270 and 270' each carry a series of spaced pins 276 extending outboard of the path thereof. The infeed end of the conveyor 22 laps over the outfeed end of the conveyor 12 so that the lower runs of the chains 270 and 270' are in a path slightly above the path of the web and the pins 276 are forced through the web material and backing board along opposite margins thereof. The pins 276 have spearlike heads 277 (FIG. 28) and the web material and backing board is impaled thereon so that the web is advanced along the lower run of the conveyor 22 to the cut out apparatus 23.

The cut out apparatus 23 is mounted on an upright frame 278 and comprises a vertically reciprocating head 280 mounted for vertical sliding movement on upright posts 281 extending upwardly of a carriage 282 on which the frame 278 is mounted for movement in a horizontal path. The carriage 272 is provided with rollers 283 at the four corners thereof which ride in parallel, laterally spaced track members 284 extending lengthwise of the machine and forming part of the frame thereof. The carriage 282 is adapted to be reciprocated in a horizontal path and is connected to a pitman 285 which is pivotally connected at 286 to the upper end of an arm 287 having its lower end pivoted at 288 to the frame 25. The arm 287 carries a cam roller 290 which is operative in a cam track 291 in a plate cam 292 mounted on a cam shaft 293 extending between the side frame plates. The cam shaft 293 is driven by a sprocket 294 which is in turn driven by chain 295 running from the main drive shaft 296 (FIG. 2A). The chain 294 also drives a sprocket 297 on the drive shaft 63 which drives the conveyor 13. The head 280 carries on its bottom face a punch 300 (FIG. 30) and the carriage 282 has a centrally apertured die member 301 (FIG. 29) for co-operation with the punch 300 to die cut out of the web the successive packages. Both the web and the backing board are trimmed. The head 280 is reciprocated by an air cylinder 302 carried on the head 300 with its piston connected to the frame 278.

The carriage **282** carries at its trailing end a small frame **305** which is angled down from the same and supports a cross rod **306** on which there is pivotally mounted a small rectangular frame **307** extending beneath the carriage **282** and carrying a plate **308** on which the package is adapted to drop. A torsion spring **310** on the pivot rod **306** normally holds the plate **308** against the bottom anvil **301** until a package is cut out of the web and drops onto the plate. The weight of the package swings the plate **308** downwardly and the package slides off onto a take-away conveyor or the like.

The waste material which results after the packages are cut out by the operation of the head **300** advances to a point near the end of the lower run of the conveyor **22** where a pair of discs **312** and **312'** (FIGS. **29** and **31**) are mounted on brackets **313, 313'** so that the peripheral edge strikes the web material just inside of the pins **276** and forces the web material free of the pins **276** on the conveyor **22.** The waste thus freed from the conveyor is drawn beneath a pair of driven rollers **314** which are journaled between the side frame members and passes to a collecting reel **24.** The reel **24** is mounted on a shaft **315** which is journaled between side frame members and which carries a sprocket **316** driven by the chain **317.** The chain **317** is driven by a sprocket **318** on the cam shaft **293.** The chain **317** also drives a sprocket **320** on the cross shaft **274** which carries the leading end of the conveyor **22.**

We claim:

1. A method of packaging which comprises advancing in random succession products supported on backing boards which have means for identification thereon which are to be packaged and provided with a label selected from a supply thereof according to predetermined identification of the product which comprises subjecting the advancing products to a scanning device which identifies each successive product and sets a mechanism for controlling subsequent packaging and labeling operations according to identification of the product, enclosing said successive products and their backing boards to form packages by applying a covering film material in sealed relation to the margins of the backing board, advancing the successive packages thus formed to a label applying station, providing a separate stack of labels at the label applying station corresponding to each identification on said backing boards, automatically selecting a label from one of said stacks for each package in accordance with the setting of said control mechanism and the identification of the package backing board, and applying the selected label to its package.

2. A method of packaging which comprises advancing in random succession predetermined quantities of a product which are supported on individual backing boards and which are adapted to be packaged by applying a covering film over the backing board and product assemblies and providing thereon a label selected according to predetermined identification on the backing board, which method comprises subjecting the advancing assemblies to a scanning device which identifies the same and sets a mechanism for controlling subsequent packaging and labeling operations according to the identification on the backing board, applying a continuous film of packaging material over the successive assemblies, sealing portions of the film material to marginal portions of each backing board in areas surrounding the associated product, advancing the successive packages thus formed to a label applying station, selecting a label for each package in accordance with the setting of said control mechanism, applying the label to each package, transferring the packages to a trimming area and trimming away excess material in the backing board margins so as to separate the packages and trim the same to uniform size.

3. A method of packaging as set forth in claim **2** and applying the label to each package by first pressing a margin of the label into adhesive engagement with a portion of the advancing package and wiping the same down over a portion of the product.

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