United States Patent

Holmes

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[54] SEMI-AUTOMATIC CLOSURE APPLICATOR

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[73] Assignee: **Kwik Lok Corporation,** Yakima, Wash.

[22] Filed: **Feb. 8, 1971**

[21] Appl. No.: **108,401**

[52] **U.S. Cl.** .....**53/67,** 53/131, 53/138 A

[51] **Int. Cl.** **B65b 51/00,** B65b 57/02

[58] **Field of Search** .....53/14, 67, 137, 138, 138 A, 53/198 A

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Assistant Examiner—Neil Abrams
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[57] **ABSTRACT**

A power-cycled machine triggered by the manual vertical presentation thereto of a bunched bag neck, to apply in confining relation to said neck a "Kwik Lok" type of bag closure. The machine receives closures in strip form, each closure having a narrow forward opening connecting with a heart-shaped closure aperture forming jaws preventing escape of the bag neck forced through said opening into said aperture. This strip is advanced during the second half of each cycle to feed the foremost closure into a slot in a closure applying rocker with the latter rocked upwardly into horizontal position. As the cycle is concluded, the rocker is rocked 60° downward to thus incline downward the foremost closure. The next cycle is initiated by presenting a vertically bunched bag neck manually to the middle of the rocker, the bag neck engaging a trigger starting the motor which rocks the rocker to swing the foremost closure back up to horizontal position, thus flexing the jaws thereof about the bunched bag neck and trapping the latter in the closure aperture. The motor automatically stops when this occurs, and starts again to complete the cycle when the closed bag is pulled forwardly to separate the foremost closure from the strip. The next following closure then becomes the foremost in the strip and is automatically fed into the rocker and swung downwardly 60° in readiness to be applied to a bag in the next following cycle. An automatic indexer prevents escape rearwardly of the foremost closure while being applied to a bag neck. The indexer also secures the balance of the closure strip against being pulled forwardly by the separation of the closure on the bag from the rest of the closure strip. Provision is also made for optionally feeding through the machine bare closures in strip form or strips of such closures having labels glued on the individual closures. The machine also has a printer for printing dates or code markings on the individual closures or labels as they pass through the machine.

14 Claims, 27 Drawing Figures

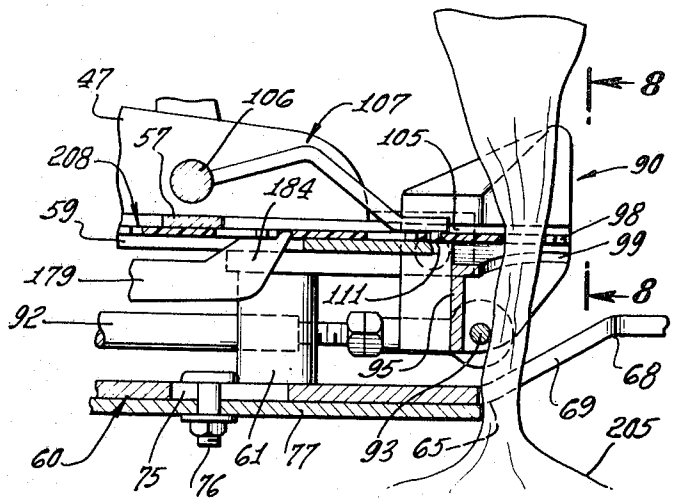


FIG. 1.

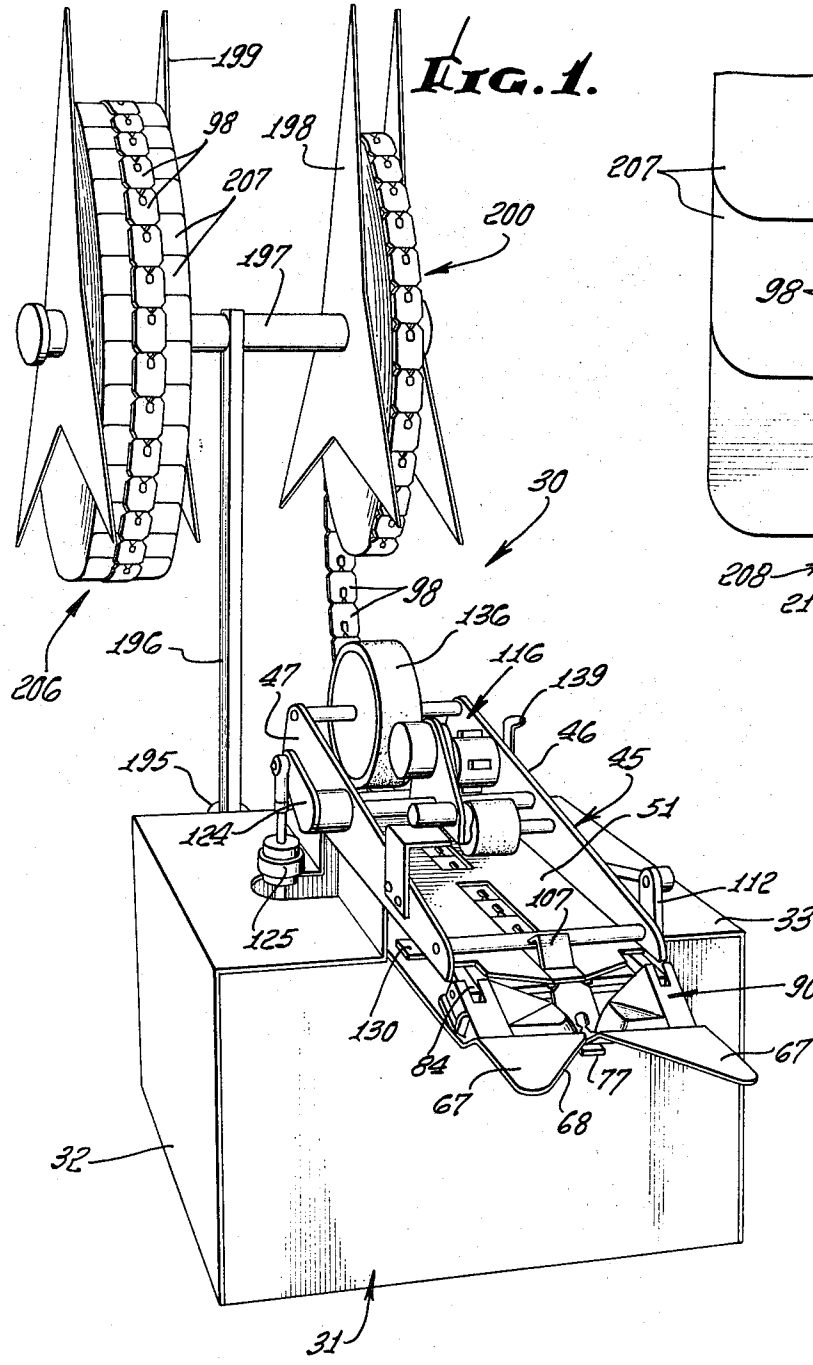


FIG. 3.

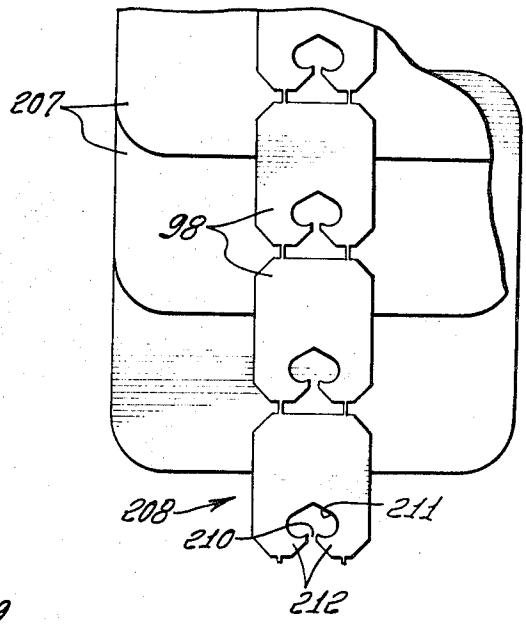
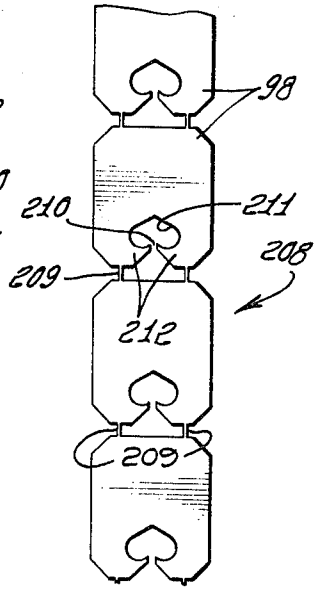


FIG. 2.



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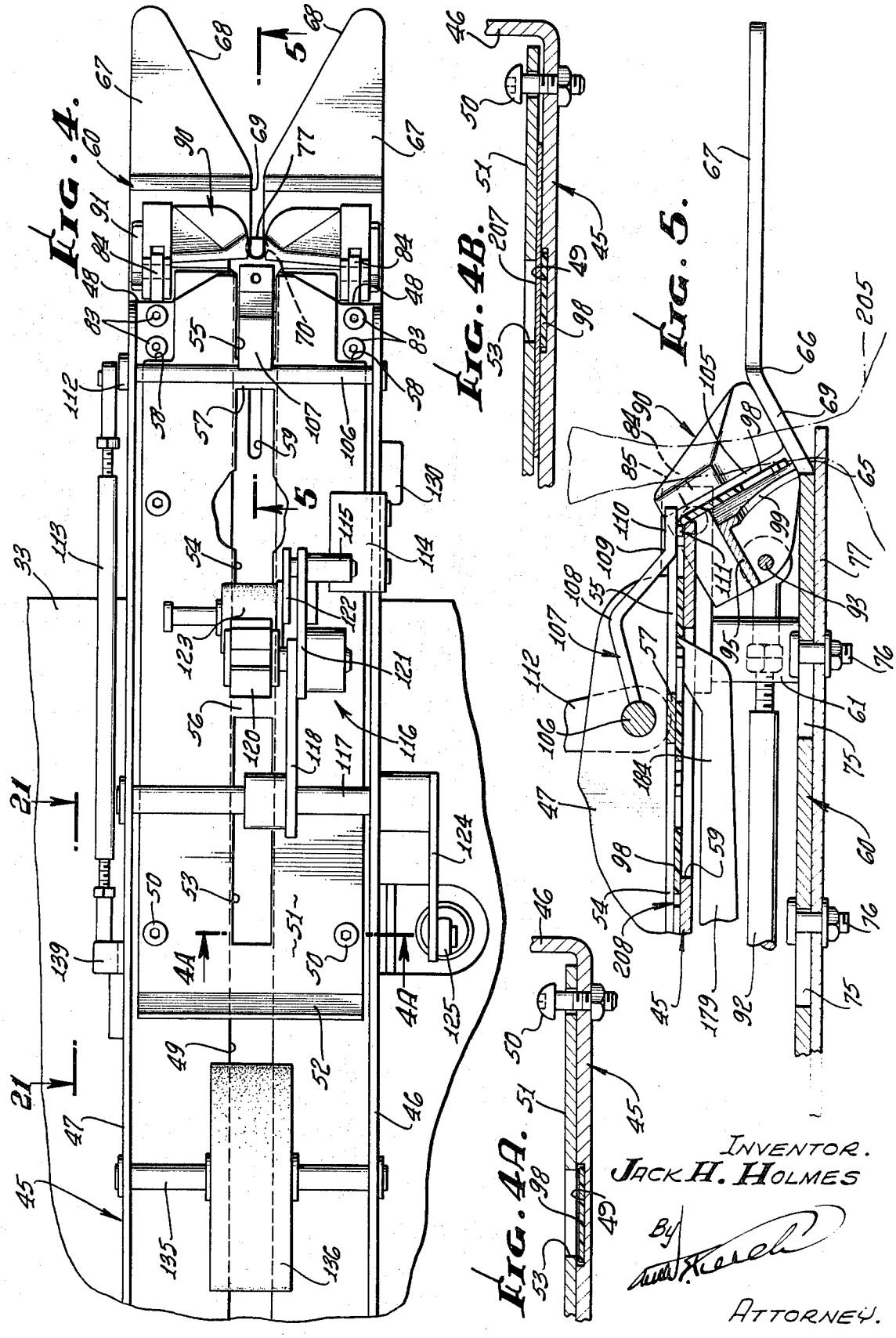
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FIG. 4B.
FIG. 5.
FIG. 4A.
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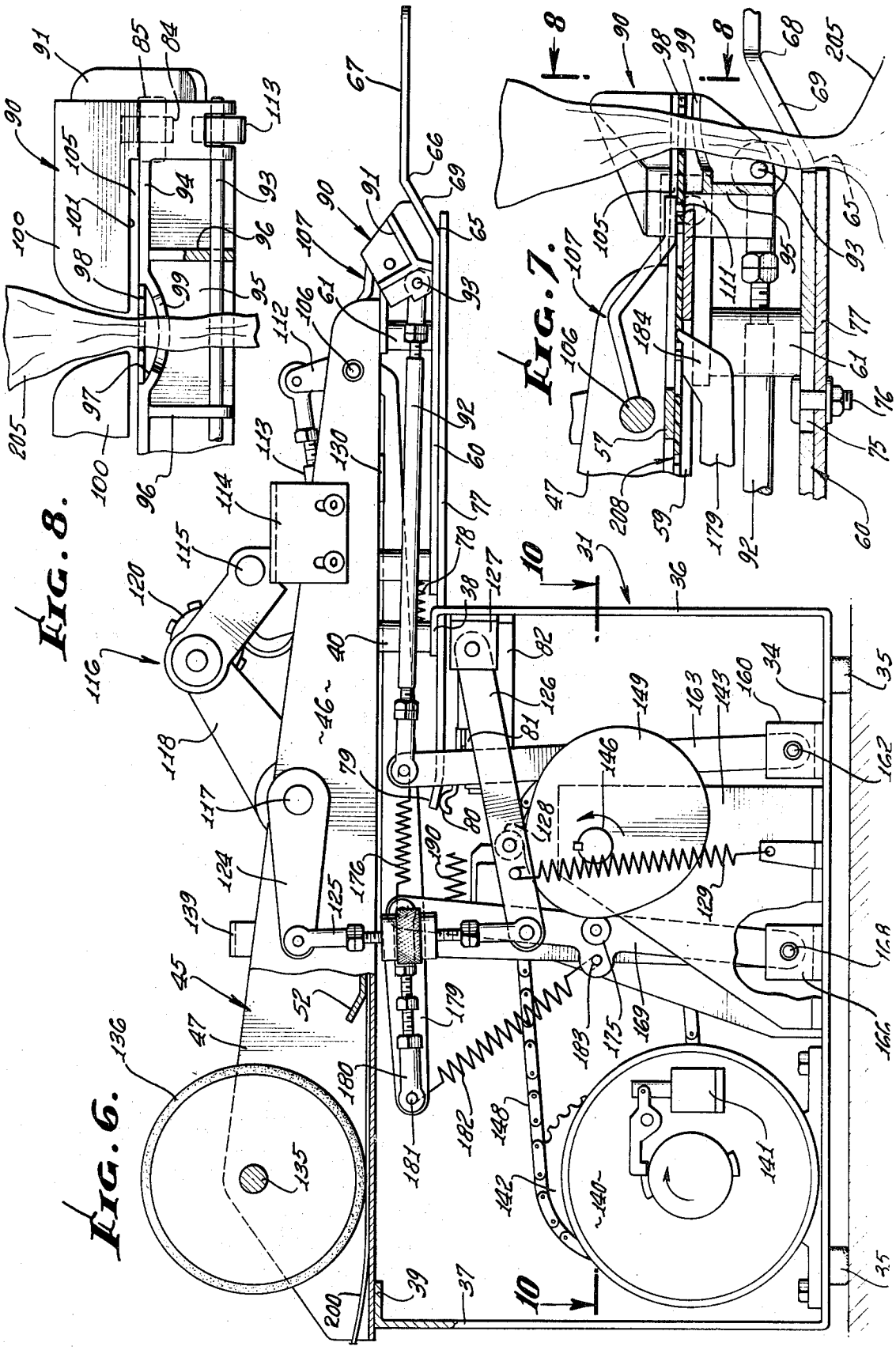
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FIG. 8.

FIG. 10.

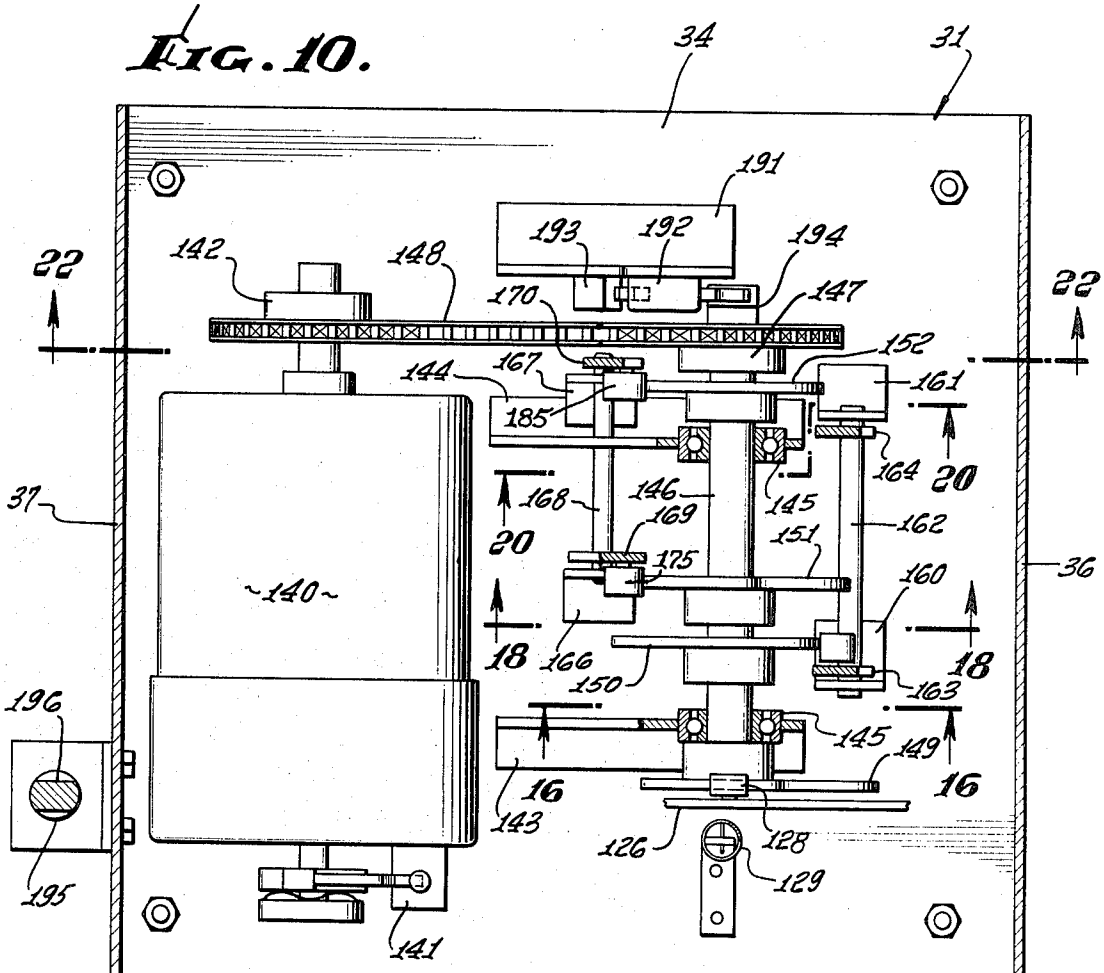
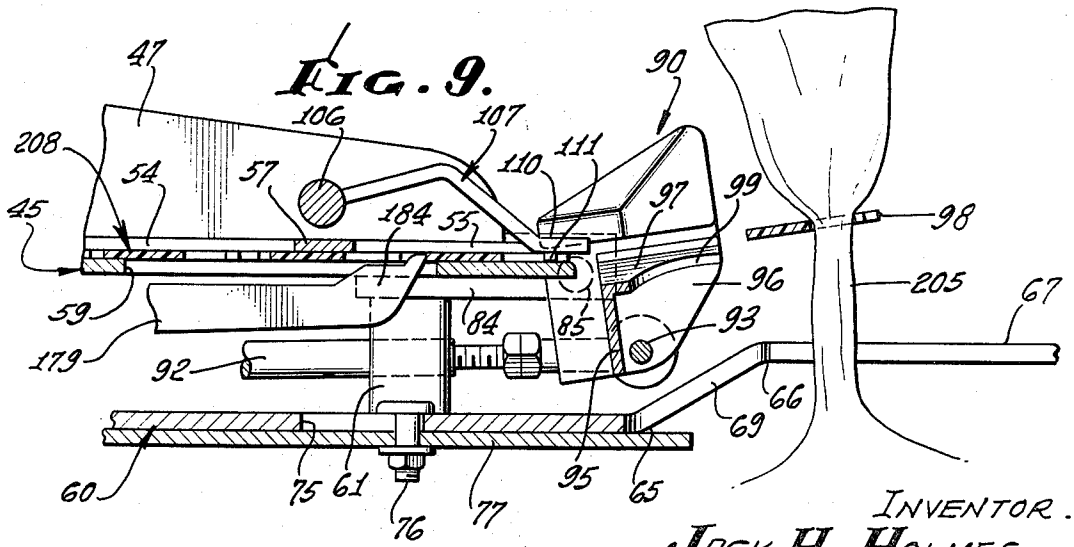


FIG. 9.



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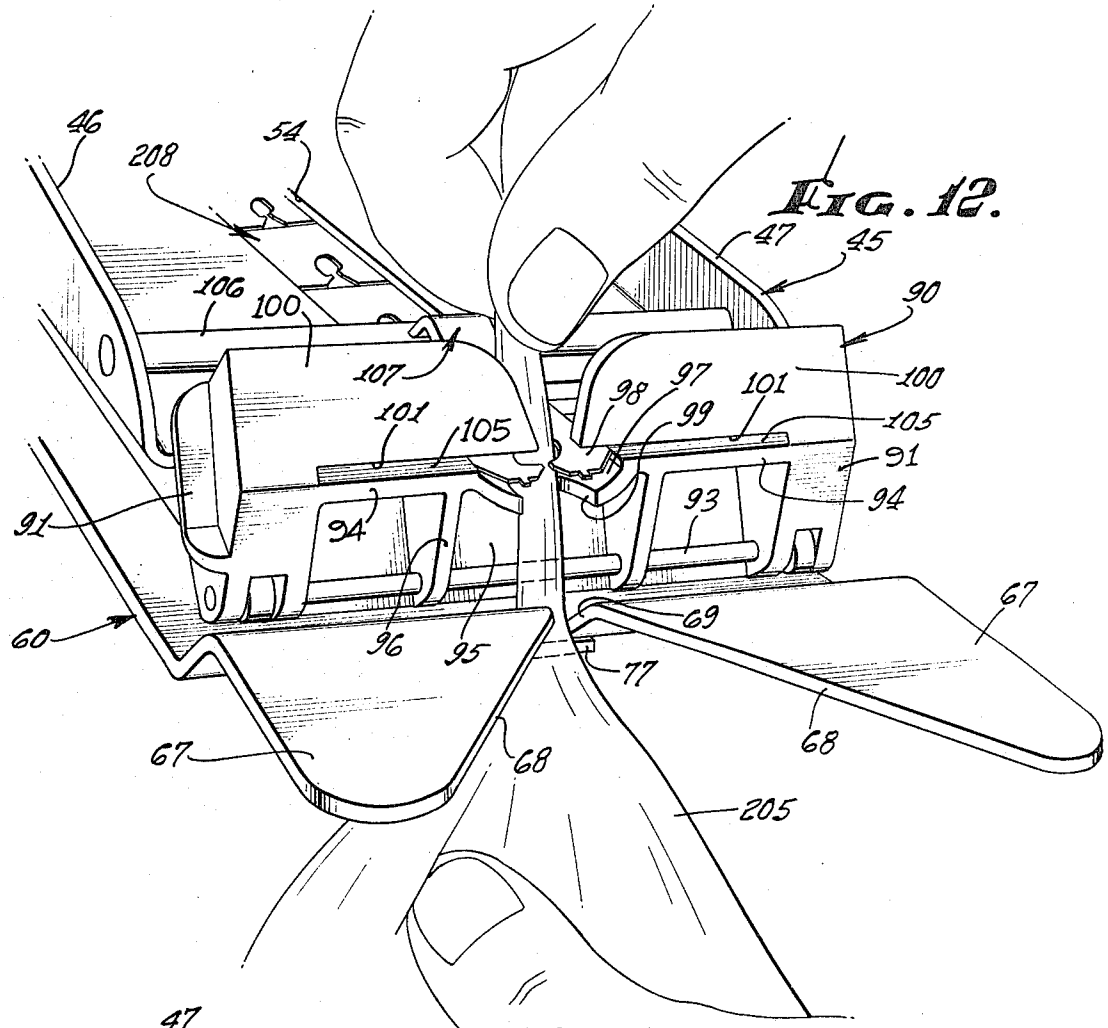

FIG. 12.

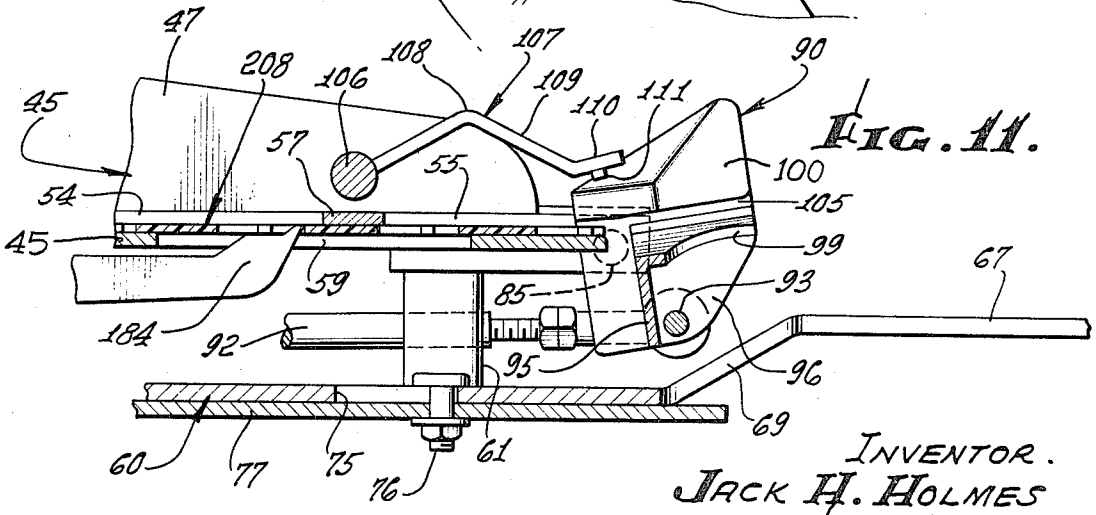

FIG. 11.

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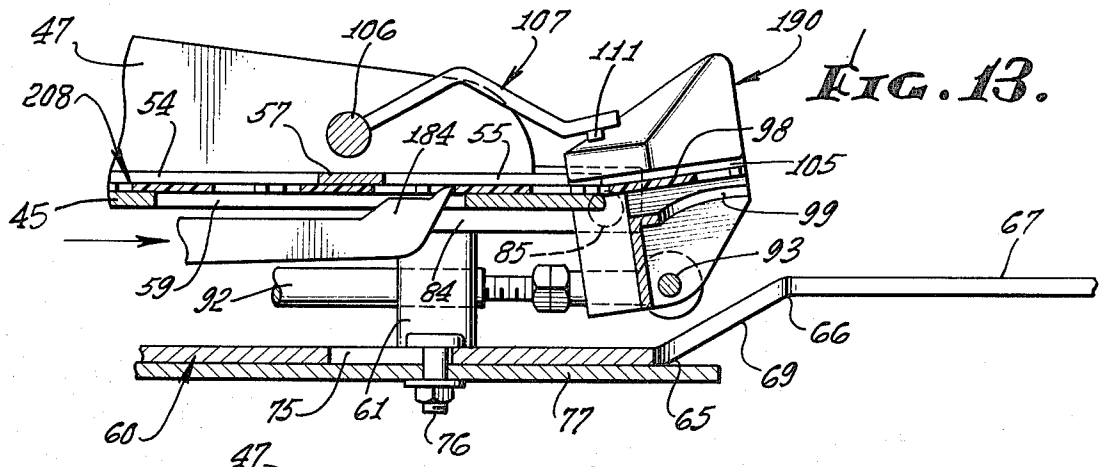

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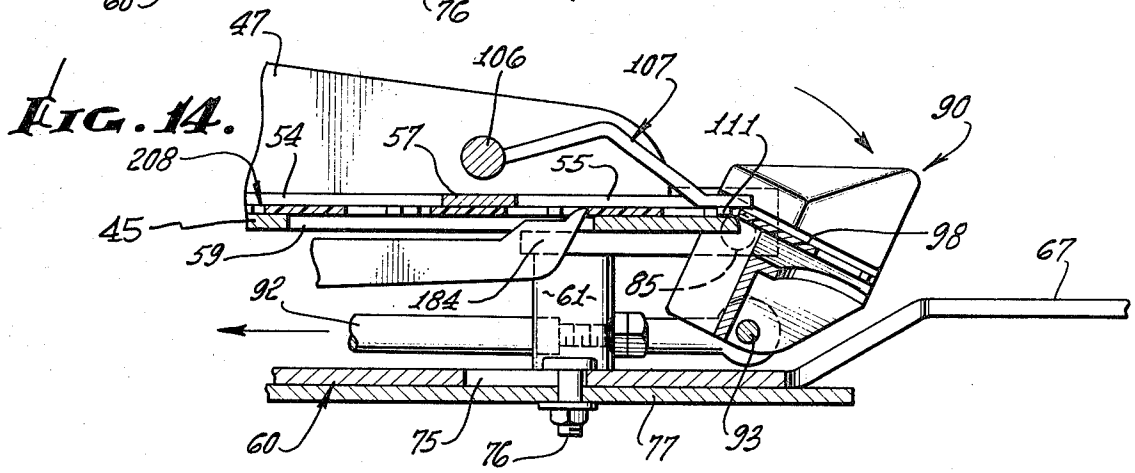

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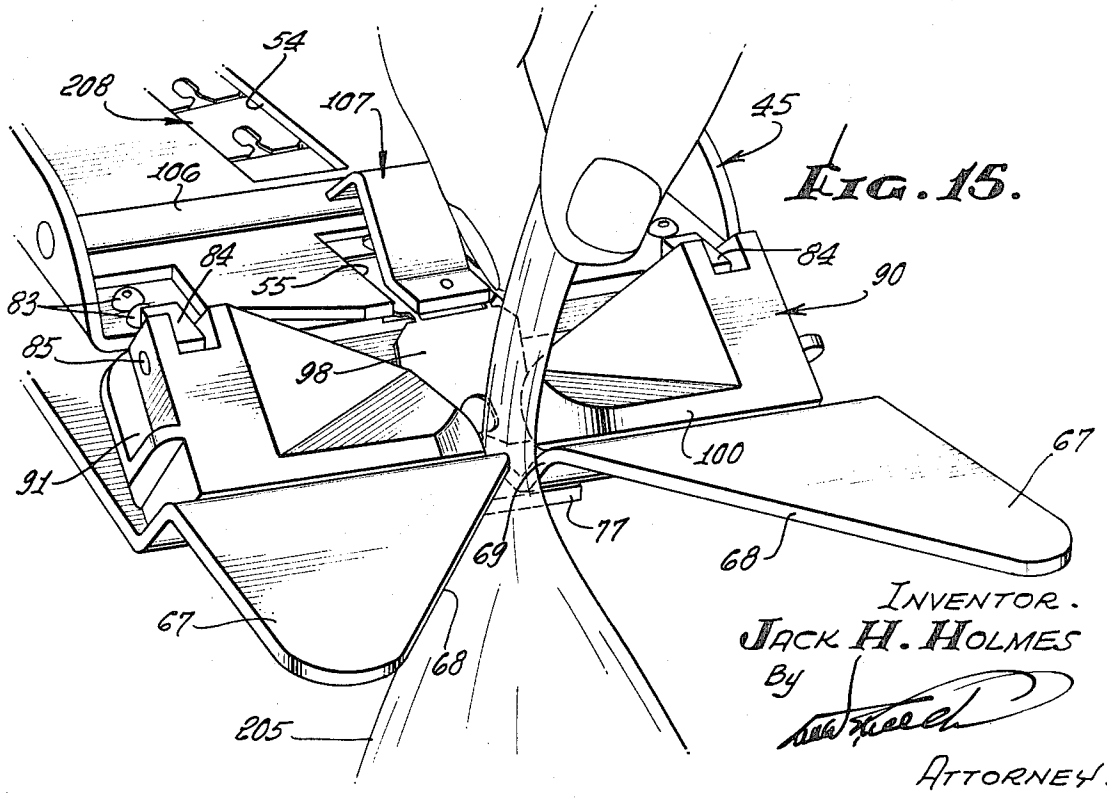

FIG. 15.

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FIG. 16.

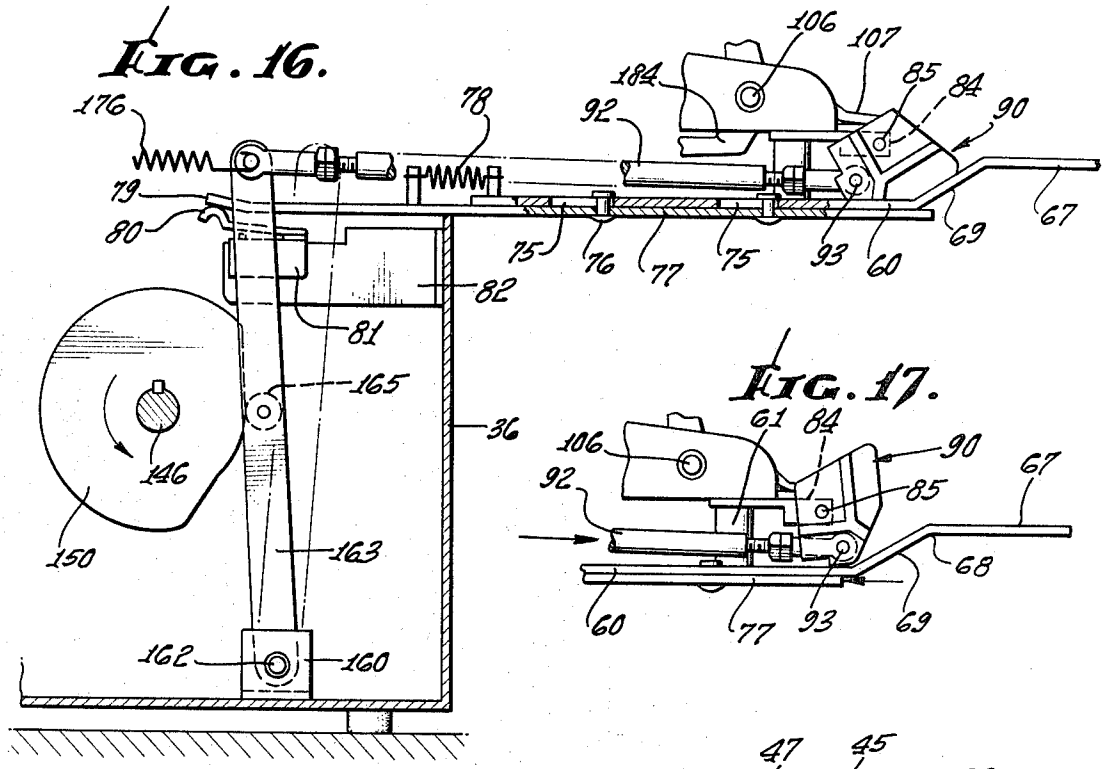

FIG. 17.

FIG. 18.

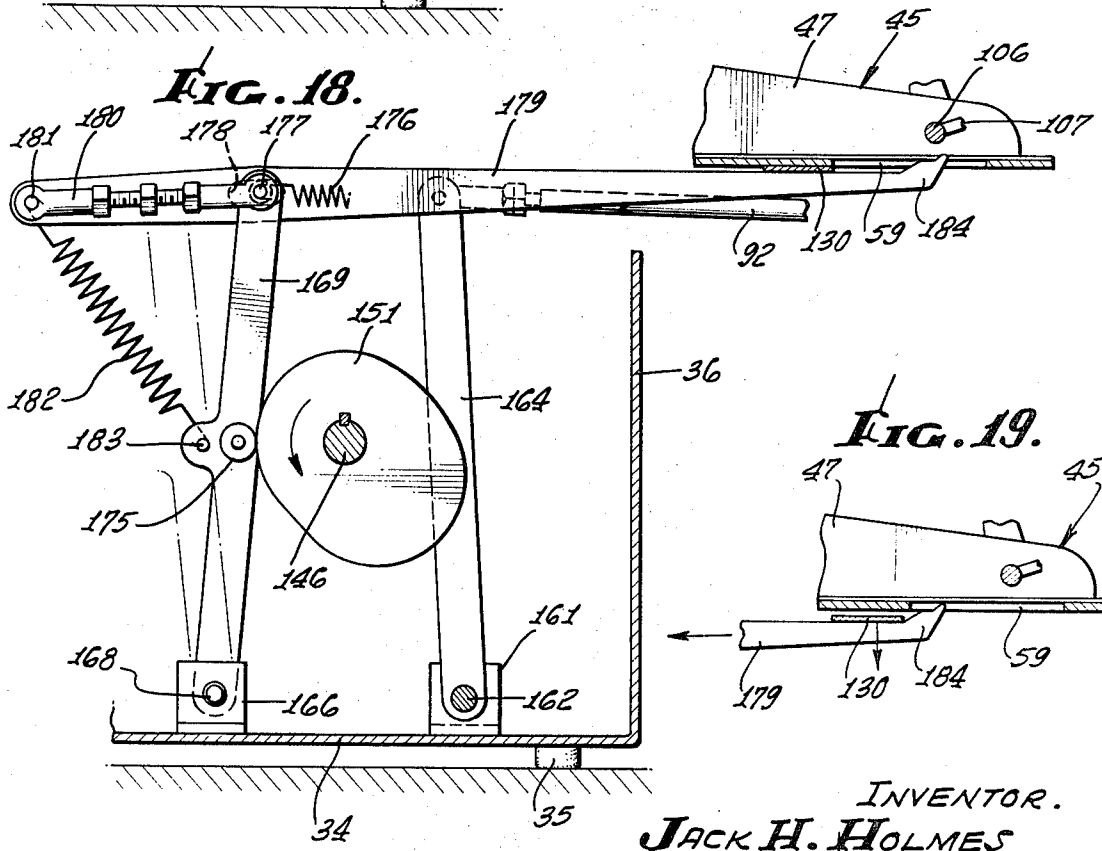

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FIG. 20.

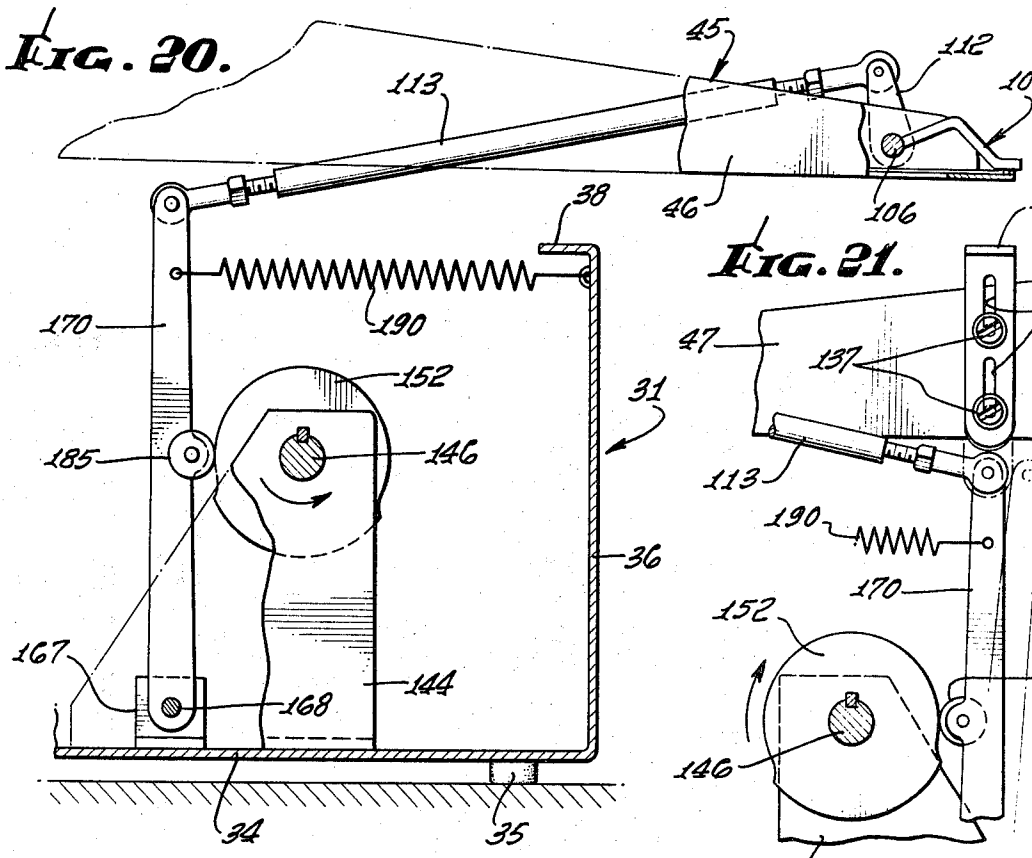

FIG. 21.

FIG. 22.

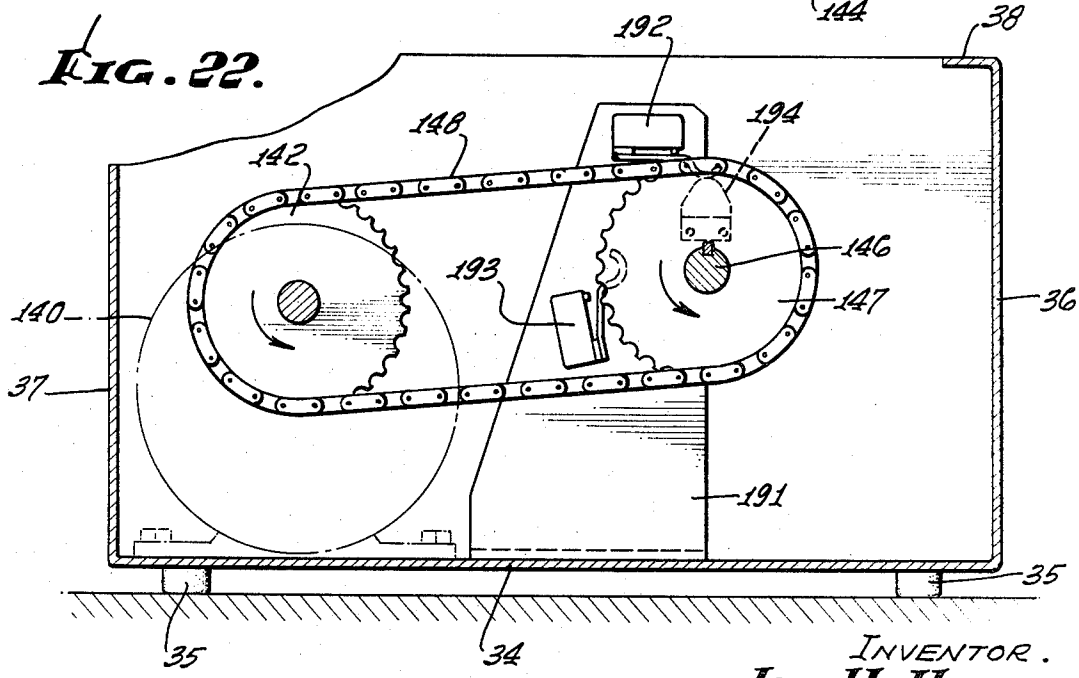

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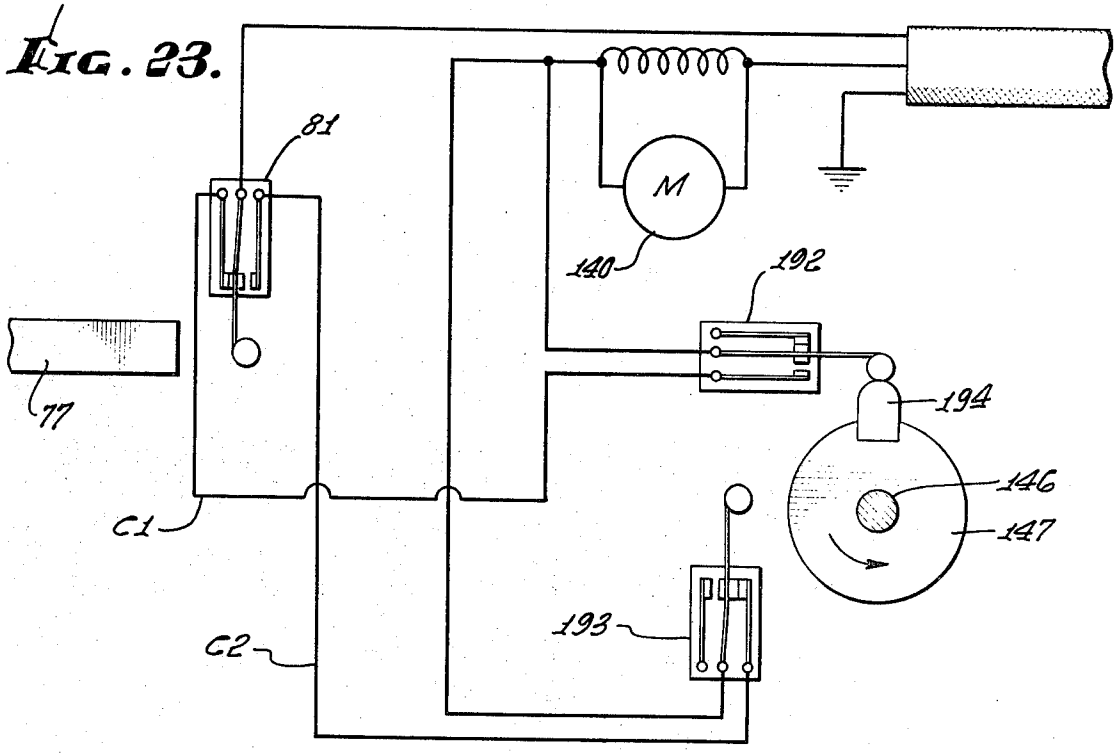
FIG. 23.



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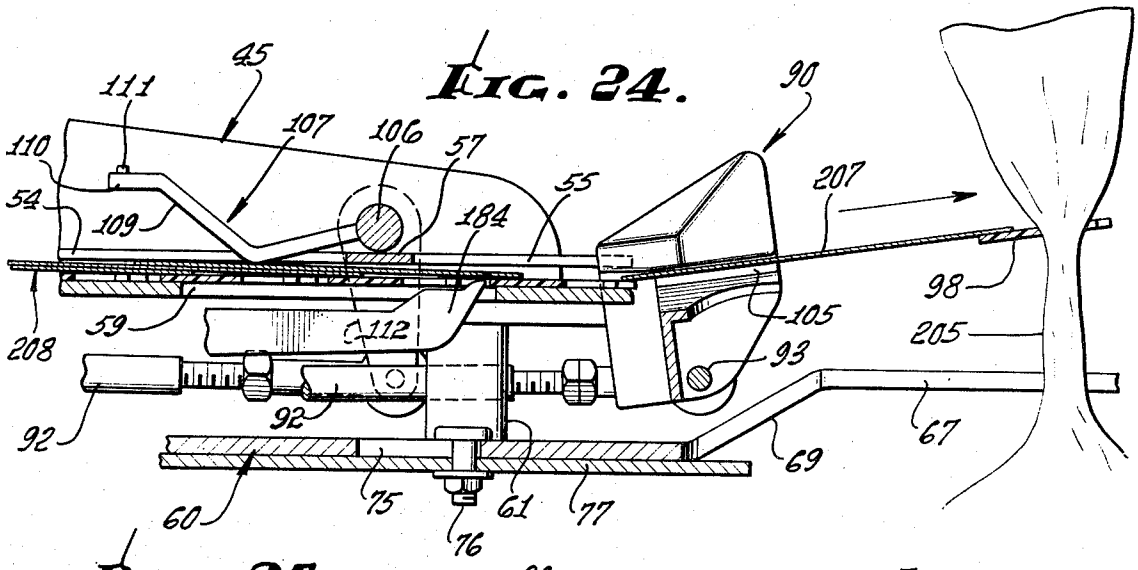
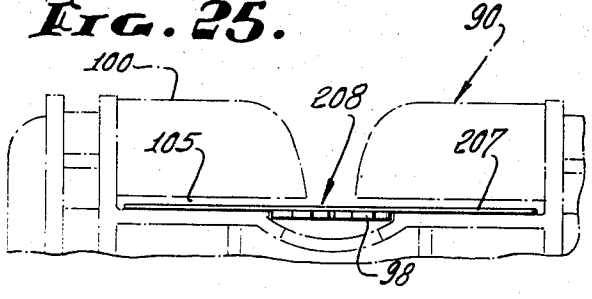


FIG. 25.



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SEMI-AUTOMATIC CLOSURE APPLICATOR

SUMMARY OF THE INVENTION

Fully automatic power driven closure applicators have been heretofore available which receive Kwik Lok type closures in strip form and apply these successively to the necks of polyethylene bags containing products of various kinds and conveyor-fed to the machine. Hand powered semi-automatic machines have also been provided to which this type of bag closures have been fed in strip form which positions the leading closure in the strip and properly supports the same so that the operator may manually apply the bunched neck of the bag vertically to the foremost closure in the strip so that the jaws of the closure will be deflected to admit the bag neck into the closure aperture, after which this closure may be separated from the balance of the strip by pulling the bag from the machine, this withdrawal operating to pull the strip forward to properly position the next closure in the strip for application to the next bag neck presented to the machine.

It is an object of the present invention to provide a semi-automatic closure applicator the strip feeding and closure applying functions of which are power driven, thus decreasing the labor required and speeding up the operation.

It is another object of the present invention to provide such a semi-automatic closure applicator which provides the ready option to the operator of applying either the bare closure to a bag or to apply to the bag a closure having a label glued to the closure.

A further object of the invention is to provide such a machine having power actuated means for printing dates or code marks on the closures or on the labels carried by closures being fed through the machine.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a preferred embodiment of the invention showing the same in starting position with a strip of plain Kwik Lok type closures threaded into operative position in the machine.

FIG. 2 is a full scale view of a section of a strip of Kwik Lok type bag closures such as is shown threaded into the machine in FIG. 1.

FIG. 3 is a full scale view of a section of a strip of Kwik Lok type closures, on the individual closures of which labels are glued and a roll of which strip is provided on said machine for optional threading into the machine for the application of label-carrying closures to bag necks.

FIG. 4 is a fragmentary plan view of the invention drawn approximately to one-half scale.

FIG. 4A is an enlarged vertical sectional detail view taken on line 4A—4A in FIG. 4 and illustrates the guiding of a strip of naked closures in the strip guide base.

FIG. 4B is a view similar to FIG. 4A showing a strip of label bearing closures being so guided.

FIG. 5 is an enlarged fragmentary vertical sectional view taken on the line 5—5 of FIG. 4 and shows, approximately at full scale, the parts of the invention at the beginning of a power cycle in the application of the foremost naked closure of a strip of these being fed into the machine, and shows in broken lines the manner in which the bunched neck of a polyethylene bag is presented vertically to the machine so as to trigger the latter in starting a power cycle in which said foremost closure will be applied to said bag neck.

FIG. 6 is a fragmentary left side elevational view of said machine partly broken away and with the outer cover removed to show the inner working parts thereof, the elements of the machine being shown as these are related at the start of a power cycle, or at the end of such a cycle.

FIG. 7 is a view similar to FIG. 5 and illustrates the relationship of the machine parts shown therein just before the conclusion of the first quarter of a power cycle of the machine which results in the motor being automatically stopped.

FIG. 8 is a fragmentary front elevational view of FIG. 7 taken on line 8—8.

FIG. 9 is a view similar to FIG. 7 and illustrates the starting of the second operative portion of a power cycle by withdrawal of the closed bag from the machine thereby separating from the front end of the closure strip the closure just applied to said bag and freeing the motor control trigger from the pressure of the bag, thereby starting the motor.

FIG. 10 is a horizontal sectional view taken on the line 10—10 of FIG. 6 and illustrates in plan the cam shaft and geared drive motor of the invention.

FIG. 11 is a view similar to FIG. 9 and shows the next succeeding relationship between the parts in a power cycle of the machine in which the strip indexer releases the strip from downward pressure thereagainst and the closure strip pick is retracted the length of a single closure and is spring pressed upwardly into position for starting a feeding stroke.

FIG. 12 is a perspective view of the rocker corresponding to the sectional view of FIG. 7.

FIG. 13 is a view similar to FIG. 11 and illustrates the conclusion of the closure strip feeding stroke with the indexer still lifted.

FIG. 14 is a view similar to FIG. 13 and shows the closing of the indexer on the strip after the strip feeding movement is completed and while the rocker jaw is just starting to return downwardly to its cycle closing position shown in FIG. 5.

FIG. 15 is a perspective view of the rocker corresponding to the sectional view of FIG. 5, with a bag neck starting a closing cycle.

FIG. 16 is a diagrammatic fragmentary vertical sectional view taken on the line 16—16 of FIG. 10 and illustrates the operation of the rocker actuating cam.

FIG. 17 is a fragmentary side elevational view of the rocker as rocked upwardly by said cam.

FIG. 18 is a fragmentary sectional operational view, taken on line 18—18 of FIG. 10, of the closure strip feed cam and shows the strip pick in its most advanced strip feeding position.

FIG. 19 is a fragmentary sectional view illustrating the retraction of said strip feed pick by said cam and also illustrates the release finger for releasing said pick when it is desired to withdraw a strip of closures from the machine.

FIG. 20 is a diagrammatic sectional operational view, taken on line 20—20 of FIG. 10, of the strip indexer operating cam, this view showing the indexer applying pressure downwardly on the front end portion of a strip of bare closures being fed through the machine.

FIG. 21 is a fragmentary sectional view taken on line 21—21 of FIG. 4 and illustrates the indexer neutralizing latch.

FIG. 22 is a diagrammatic vertical sectional view taken on the line 22—22 of FIG. 10 and illustrates the power actuated switches of the motor control system of the invention.

FIG. 23 is a diagram of the electrical wiring of the invention.

FIG. 24 is a fragmentary vertical sectional view similar to FIG. 9 but shows the machine applying label equipped closures to bags and with the indexer reversed to apply pressure to the labels which cover the closures.

FIG. 25 is a front edge view of a label equipped closure shown in full lines as it is being withdrawn from the closure flexing rocker of the invention as shown in FIG. 24 with the rocker shown in broken lines so as to clearly distinguish between the two and illustrates how a space is provided in said rocker for optionally handling a strip of bare closures as well as a strip, the individual closures of which have labels glued thereto.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The machine 30 shown in perspective in FIG. 1 has a sheet metal frame 31 with open sides which are covered by housing plates 32 and 33. The frame 31 includes a bottom plate 34 which is supported on four rubber feet 35 and is bent upwardly at its front and rear edges to provide front and rear end walls 36 and 37. Front wall 36 is lower than the back wall and

the upper edges of both said walls are bent towards each other to form support flanges **38** and **39**. Mounted on support flange **38** is a pair of short posts **40**, the upper ends of which are level with support flange **39** and combine with the latter to support a strip guide base **45** which is formed of sheet metal the sides of which are bent upwardly to form left and right side walls **46** and **47**. The strip guide base **45** extends for about one-third of its length forwardly beyond front end wall **36** and has notches **48** formed in the front end thereof as clearly shown in FIG. **4**. Milled in the upper surface of the strip guide base **45** throughout its length is a closure strip guide channel **49**.

Resting on top of strip guide base **45** and loosely secured thereto by bolts **50** is a strip guide cover plate **51**. The rear edge of this plate is flared at **52** and the plate is provided centrally with a series of slots **53**, **54** and **55** which are spaced from each other by webs **56** and **57**, slot **55** opening from the front end of cover plate **51** which is flush with the front end of strip guide base **45**. The front corners of cover plate **51** are notched at **58** as clearly shown in FIG. **4**.

Formed centrally in the strip guide base **45** which is to say in the middle of strip guide channel **49**, near the front end of the latter, is a pick receiving slot **59**.

Secured at their upper ends to strip guide base **45** and at their lower ends to a bag neck guide shoe **60** are four posts **61** which are equal in length to posts **40** whereby the shoe **60** is supported on the same level as support flange **38** on the front wall **36**. The shoe **60** is bent upwardly at **65** at an angle of 30° and is then bent reversely at a similar angle at **66** to form a pair of horizontal guide arms **67**, the inner edges **68** of which diverge at an angle of 60°, these edges terminating at their rear ends in the side walls of a slot **69** which extends from the bend **66** to the bend **65** where said slot terminates in a circular end portion **70**. Formed centrally in the shoe **60** is a pair of slots **75** for receiving bolts **76** which loosely mount a switch actuating bar **77** for free endwise sliding movement on the shoe **60** and with the front end of bar **77** extending about a half inch forwardly of the rear end of the slot **69** when said bar is in its most advanced position on said shoe. The rear end portion of bar **77** extends through a suitable slot formed in the upper edge of front frame wall **36** and is provided with a coil spring **78** which biases said bar into its forward position whenever said bar is disengaged. The rear end portion **79** of bar **77** is inclined upwardly to have a camming relation with the arm **80** of a switch **81** mounted on a bracket **82** which is secured to the inner face of frame wall **36**.

Secured to the front corner portions of strip guide base **45** in the areas thereof uncovered by notches **58**, in front corners of strip guide cover plate **51**, by bolts **83**, is a pair of bearing arms **84**. These arms have aligned pins **85** on which a closure rocker **90** is pivotally mounted. This element is preferably die-molded of bakelite and includes end heads **91** which are recessed in the planes of bearing arms **84** to receive the latter and also have bores to receive the pins **85** so as to rockably support the rocker **90** on the axis of these pins. The end heads **91** are also recessed in the planes of bearing arms **84** to receive the apertured forward ends of a pair of turnbuckle pitmen **92** which underlie side portions of strip guide base **45**. The rocker heads **91** are also provided with bores to receive a pin **93** which extends transversely entirely through rocker **90** and the opposite end portions thereof penetrate the apertured ends of pitmen **92** so as to pivotally connect said pitmen with the rocker on the axis of said pin.

The axis of the pins **85** approximately coincides with the front edge of the strip guide base **45** so that this axis is somewhat eccentric relative to the mass of the rocker **90**. Forwardly and downwardly from said axis, the end heads **91** of the rocker **90** are connected by a floor **94** and a downwardly extending wall **95** which is integral with the rear edge of said floor. The floor **94** and the wall **95** are reinforced by webs **96**. A central portion of the floor **94** has an arcuate channel **97** formed therein which is just wide enough and slightly depressed at its side edges to neatly receive a Kwik Lok type closure **98** within said channel so that the upper face of the closure is flush with the upper face of floor **94** but the body of the closure is unsupported except at its side edges and is thus free to be flexed downwardly to the limits provided by the arcuate channel **97** therebeneath. In the area of the channel **97** the floor **94** is recessed from the front end thereof to form a deep notch **99**, the purpose of which will be made clear hereinafter.

Extending inwardly from upper portions of the end heads **91** so as to overlie substantial portions of the floor **94** are cantilever guides **100**, the lower surfaces **101** of which are parallel with the floor **94** and closely spaced therefrom to form aligned slots **105** between said guides and said floor on opposite sides of the arcuate channel **97**. Juxtaposed inner ends of the guides **100** overlie edge portions of the channel **97** to loosely confine a closure **98** in said channel as shown in FIG. **8**. The juxtaposed ends of guides **100** are shaped to flare outwardly away from each other as shown in FIG. **4** so as to cooperate with the converging edges **68** of the guide arms **67** of the shoe **60** to bunch a loose neck portion of a plastic bag when the same is advanced into slot **69**, the importance of which will be pointed out in describing the operation of the machine.

Fixed on a shaft **106** which journals in suitable bearings provided in side walls **46** and **47** is an index arm **107** having bends **108** and **109** therein so that when said arm is turned forwardly from shaft **106**, an end portion **110** thereof will be horizontal. Outstruck downwardly from the end portion **110** is a cylindrical stud **111** the purpose of which will be made clear hereinafter. Extending upwardly from the shaft **106** just outside right side wall **47** is an arm **112**, the upper end of which pivotally connects with the forward end of a turnbuckle pitman **113**.

Secured to left side wall **46** of strip guide base **45** is a printer guide track **114** on which a roller **115** of a printing device **116** is supported. Journalling in suitable bearings provided on walls **46** and **47** is a shaft **117** having an arm **118**, the outer end of which supports a rotary printing head **120** which is superimposed over slot **54** in the strip guide cover plate so that when it is depressed it can print a selected indicia on a closure strip travelling in guide channel **49**. Pivotally mounted on the arm **118**, concentrically with the mounting of rotary printing head **120** on said arm, is a guide arm **121** on the lower end of which roller **115** is rotatably mounted. Pivotally mounted on the same axis with the roller **115** on guide arm **121** is an arm **122** the opposite end of which carries an inking roller **123** which is spring biased by suitable spring means (not shown) into inking contact with the rotary printing head **120**. Mounted on the outwardly extending end of shaft **117** is an arm **124**, with the outer end of which the upper end of a turnbuckle pitman **125** is pivotally connected. The lower end of pitman **125** is pivotally connected to the outer end of a cam roller supporting link **126** the opposite end of which is pivotally mounted on a bracket **127** which is mounted on the inner face of front end wall **36**. Link **126** carries a cam roller **128** and is constantly biased downwardly by a spring **129**.

Mounted at one end on the bottom of the strip guide base **45** and extending across this base and outwardly from the left hand side thereof is a pick release arm **130** made of thin spring material.

Freely rotatable on a shaft **135** which is mounted at its opposite ends on strip guide base side walls **46** and **47** is a cushion tired roller **136** which is rotated by a closure strip travelling in guide channel **49** and holds said strip in said channel. Mounted on right side wall **47** on bolts **137** which are vertically aligned and extend through slots **138** thereof is an indexer neutralizing latch **139**, the purpose of which will be made apparent hereinafter.

Referring now to FIGS. **6**, **10**, **14**, **16**, **18** and **20**, the frame bottom plate **34** has mounted thereon an electric motor **140** having a solenoid stop mechanism **141**, which halts rotation of the motor when the same is deenergized, and a gear driven sprocket **142**. Also fixed on bottom plate **34** are main cam shaft bearing brackets **143** and **144** which carry ball bearings **145** in which a cam shaft **146** journals. Fixed on cam shaft **146**

is a driven sprocket **147** which is connected to sprocket **142** by an endless chain **148**. Also fixed on cam shaft **146** are cams **149, 150, 151** and **152**. As shown in FIG. **6**, the cam roller **128** rides on cam **149** and the printing device **116** is thus actuated by the rotation of said cam during each cycle of operation of the machine **30**. Journaling in brackets **160** and **161** is a shaft **162** on which are welded arms **163** and **164**, the upper ends of these arms being pivotally connected to the rear ends of turnbuckle pitmen **92** (see FIG. **16**). Mounted on arm **163** is cam roller **165** which bears against cam **150**.

Journalling in bearings provided by brackets **166** and **167** which are mounted on the bottom plate **34** is a shaft **168** having arms **169** and **170** individually rotatable on said shaft. Rotatably mounted on arm **169** is a cam roller **175** which rests against cam **151**. The upper ends of arms **163** and **169** are connected together by a spring **176** so as to constantly bias cam roller **165** against cam **150** and cam roller **175** against cam **151**. Arm **169** has a bolt **177** at its upper end which extends through an elongated slot **178** in a pick bar **179** so that the pick bar is horizontally adjustable on the upper end of arm **169**. The spring **176** connects to an extension of the bolt **177**. This bolt also penetrates an apertured end of a turnbuckle **180**, the opposite end of which is connected by pin **181** to to the rear end of pick bar **179**. The pin **181** is connected by a coil spring **182** to a pin **183** provided in arm **169** so as to spring bias the forward end of the pick bar **179** upwardly. The front end of pick bar **179** has a pointed end **184** which extends upwardly through the pick slot **59** and is constantly biased by spring **182** into operative engagement with any closure strip which may be fed along the closure strip guide channel **49**. The pick point **184** has two positions, a retracted position as shown in FIG. **19** and a forwardly extended position as shown in FIG. **18**. The pick point **184** is constantly in operative relation with a strip being fed through the machine excepting when it is depressed by the pick neutralizer finger **130**, which is shown in FIG. **19** as depressing the pick point **184** to permit withdrawal of a strip of closures from the machine.

Referring now to FIG. **20**, the upper end of arm **170** is shown as pivotally connected with the rear end of indexer turnbuckle pitman **113**. Arm **170** is also provided with a cam following roller **185** which is constantly biased towards cam **152** by a coil spring **190**. The upper end of arm **170** is in vertical alignment with the indexer neutralizing latch **139**, as shown in FIG. **21**, when positioned as shown in full lines in this view. When it is desired to neutralize the indexer arm **107**, the arm **170** is pulled rearwardly to lift the arm **107** and the neutralizer **139** is shifted downwardly into the broken-line position in which it is shown in FIG. **21** in which it holds the indexer in a lifted inoperative relation with any closure strip being fed through the machine. This is for the purpose of freeing a closure strip when it is desired to remove this from the machine for replacing it with a different kind of strip.

Referring now to FIGS. **10** and **22**, a bracket **191** having contact switches **192** and **193** mounted thereon is fixed in parallel spaced relation with driven sprocket **147**. This sprocket carries a switch actuating lug **194** which successively engages the operating arms of the switches **192** and **193** as the sprocket **147** rotates with the cam shaft **146**.

Referring now to the wiring diagram shown in FIG. **23**, switches **192** and **193** are single poled switches each of which is closed when not actuated by engagement by the lug **194** and is open when engaged by said lug. Switch **81** is a double pole switch. Motor **140** has two energizing circuits, C1 which contains switch **81** and switch **192**, and C2 which contains switch **81** and switch **193**. When the machine **30** is halted, between operating cycles, the bar **77** is spring biased forwardly as shown in FIGS. **5** and **6**, thus closing switch **81** on circuit C1 and opening switch **81** on circuit C2. At this time lug **194** has opened switch **192** which interrupts circuit C1 so that both circuits are interrupted and motor **140** is de-energized.

Rotatably mounted on a vertical bearing **195** provided on the rear end wall **37** of the machine **30** is a standard **196** with suitable indexing means (not shown) permitting said standard to be rotated **180°** from the position in which this is shown in FIG. **1**. A shaft **197**, extending diametrically in opposite directions from the upper end of standard **196**, is provided at its outer ends with reels **198** and **199**, the first of which is relatively narrow and accommodates a roll **200** of Kwik Lok closures **98** which are bare of labels and which is shown in FIG. **1** as oriented with the machine **30** and supplying a strip of such closures which is threaded through the machine to place the latter in readiness for operation in applying such bare closures one at a time to flexible polyethylene bags **205**. The reel **199** is somewhat wider than the reel **198** and contains a roll **206** embodying a strip of closures **98**, each individual closure of which has a label **207** glued thereto.

It is to be noted that the closures **98** in either of the rolls **200** and **206** are united end-to-end in a strip **208** by adjacent closures being connected by webs **209**. Each closure **98** has a narrow opening **210** at the forward end thereof with flared edges to assist in delivering a bag neck through said opening into an interior aperture **211** with which said opening connects. This aperture may be any shape but is preferably heart shaped as shown in FIGS. **2** and **3** to form inwardly pointed jaws **212** on each side of the opening **210**. These jaws are effective in resisting the removal of a closure **98** from any object to which it has been applied by introducing a portion of the object or the entirety of it through the opening **210** into the aperture **211**.

OPERATION

When threading the machine **30** with the strip **208** of closure **98** as shown in FIG. **1**, the pitman **113** may be pulled rearwardly to lift the index arm **107** to form a clear space beneath this and held thus elevated by use of the index neutralizing latch **139**. The strip **208** of closure **98** is then uncoiled from the reel **198** and fed downwardly under the cushioned roller **136**, along the closure strip guide channel **49** and underneath the strip guide cover plate **51** until this strip reaches the front end of the strip guide base **45**. The rocker **90** is then manually rocked upwardly against the biasing tension of the spring **176** to place the slot **105** in horizontal position as shown in FIG. **13** whereupon the strip **208** may be manually fed forwardly to insert the endmost closure of the strip into the rocker **90** after which the rocker may be relaxed allowing the spring **176** to rock this into its downward position in which it is shown in FIG. **5**. The latch **139** is then lifted to release indexer arm **107** causing this to be pressed down against the closure strip as shown in FIG. **5**.

The procedure just described is optional as the rocker **90** may be provided with a closure **98** without neutralizing the indexer arm **107** and merely by pushing the strip along channel **49** until the front end of the strip hits the lug **111** extending downwardly from indexer arm **107** and then push the switch actuating bar **77** rearwardly to engage the switch **81** so as to open this switch as to circuit C1 and close it as to circuit C2 whereby the latter circuit will be energized through normally closed switch **193** thereby starting the motor **140** causing it to rotate cam shaft **146** in the direction of the arrow shown adjacent thereto. As the shaft **146** starts to rotate the switch operating lug **194** is moved out of contact with switch **192** and after the shaft **146** is rotated 90° lug **194** engages and opens switch **193** thereby de-energizing circuit C2 and stopping the motor **140**. This amount of movement of the cam shaft **146** operates to swing the rocker **90** from its depressed position as shown in FIG. **5** to the position in which it is shown in FIG. **7** and with the slot **105** practically in alignment with the closure strip guide channel **49**. The rocker **90** will still not have a closure delivered thereto so pressure on the bar **77** will now be released resulting in the same disengaging switch **81**, causing this to close as to circuit C1 whereby the latter circuit will be energized, starting motor **140** and causing cam shaft **146** to rotate another three quarters of a revolution until lug **194** engages switch **192** and de-energizes circuit C1, thereby again stopping motor **140**.

During the last mentioned three-quarter revolution of cam shaft **146**, the guide strip indexer arm **107** is lifted and the pick bar **179** is retracted to the position in which this is shown in FIG. **11** and then advances to deliver a closure **98** into the rocker **90** while the latter is still in raised position as shown in FIG. **13**. The rocker then starts downward concluding with the rocker positioned as shown in FIG. **5**. During the final quarter revolution of the cam shaft **146** in any power cycle, the indexer arm **107** is returned downwardly into engagement with the closure strip **208**.

Where it is desired to print certain indicia on the individual closures **98** to be applied to bags, the printing device **116** is provided with the necessary type and ink so that it will print the desired indicia on the closure directly beneath the roller printing head **120** with each cycle of operation of the machine. The machine will then be repeatedly cycled after a strip **208** of closures has been fed into the machine as above described so that the closures appearing between the printing device **116** and the rocker **90**, including the foremost closure fed into the latter, will all bear the desired indicia before starting to apply closures to bags.

After the afore-described preparations have been completed, the bunched neck of a loaded bag **205** will be manually fed, in vertical position, into the middle of the rocker **90** as shown in broken lines in FIG. **5**, the lower portion of this bunched bag neck necessarily engaging and shifting inwardly the switch trigger bar **77** which, as above described, energizes the motor **140** and initiates the power cycle which will automatically apply the foremost closure **98** contained in the rocker **90** to the bag neck **205**. This application of the closure to the bag neck is completed in the first **90°** of rotation of cam shaft **146** which terminates with the halting of the motor **140** after the rocker **90** has been tilted from its downward position shown in FIG. **5** to its upper position shown in FIG. **7**. It is to be noted that no movement of the hands of the operator is required in this application of a closure **98** to a bag **205**, the upward rotation of the rocker **90** power flexing the jaws **212** of the closure about the bag neck following which the machine halts. This inactivity continues so long as the operator is pressing the bag neck against the front end of switch trigger **77**. Immediately upon the stopping of the machine, of course, the operator withdraws the bag neck from the machine which pulls the closure applied to the bag neck from the balance of the strip **208** by rupturing the webs **209** connecting the foremost closure to the next closure on the strip. The presence of the indexer lug **111** directly in front of the next foremost closure in the strip as shown in FIG. **7** prevents more than the foremost closure being removed from the machine by withdrawing the bag therefrom.

FIG. **9** shows how the closure just applied to the bag is separated from the strip as the bag is removed from proximity with the rocker **90** thus freeing the switch actuating arm to return to its normally forward biased position in which switch **81** is released from being closed in circuit C2 and is automatically closed as to circuit C1 this combining with now closed switch **192** to energize motor **140** through circuit C1 causing a further three quarter revolution of the cam shaft **146**, during which indexer arm **107** is lifted and the pick bar **179** is retracted to a position of readiness as illustrated in FIG. **11**.

FIG. **13** shows the completion of the strip feeding movement of the pick bar **179** to advance the next foremost closure of the strip into the rocker **90**.

FIG. **14** shows the lowering of the index arm **107** into engagement with the strip **208** at the front end of the strip guide base **45** and the start downward of the closure rocker **90** which terminates, when the motor stops, with this rocker depressed as shown in FIG. **5**.

Having described the operation of the machine **30** in applying bare closures **98** to the necks of plastic bags **205**, the mode by which label bearing closures **98** are applied to such bags will now be pointed out.

If the machine **30** is threaded as shown in FIG. **1** with a bare closure strip **200**, the first step in changing over, is to rock the indexer arm **107** upwardly, then swing arm **107** backward to force arm **112** downwardly over dead center, while depressing neutralizer latch **139** in the way of arm **170** to halt arm **107**, now extending rearwardly from its shaft **106**, with arm **107** spaced upward from contact with the closure strip **200**. The control bar **77** is now shifted rearward to cause machine **30** to operate for a quarter cycle and stop. The main switch of the machine (not shown) is now opened to de-energize the motor **140**, with the rocker **90** rotated to align slots **105** with strip guide channel **49**. The closure pick release finger **130** is now depressed to disengage the pick bar from closure strip **200** and the reel **198** is rotated to withdraw strip **200** from the machine and wind it up on said reel where the loose end of the strip can be taped down. Pressure on the pick release finger **130** may now be relaxed.

The standard **196** is now released from its indexing means and rotated **180°** to position reel **199** in alignment with strip guide channel **49**. The strip **206** of label bearing closures carried by reel **199** is now unrolled and threaded into the machine **30**. The closures **98** per se are accommodated by the strip guide channel **49** and the labels **207** support the guide plate **51** which is only loosely superimposed on the strip feed base **45** by bolts **50**, as shown in FIGS. **4A** and **4B**. The guide plate **51** thus confines the entire label bearing strip **206** in its guided relation with channel **49** and with only a slight retarding action due to the friction produced by the weight of guide plate **51** resting on the labels **207**.

When the foremost closure **98** in strip **206** extends just to the front end of strip feed base **45**, the index neutralizer **139** may be lifted and the main switch may be closed. This energizes motor **140** to accomplish the remaining three quarters of the cycle already started before turning off the main switch, thereby feeding the label bearing closure strip **206** forward the length of one closure to deliver the foremost closure into rocker slots **105** and then rock the rocker downward to its cycle starting position shown in FIG. **5**, where the motor **140** automatically stops.

It is to be noted in FIG. **24** that the smooth elbow **108** of the reversely functioning indexer arm **107** comes to rest rearwardly and downwardly against a multiple layer of labels **207**, the uppermost of which is the label glued to the next to the foremost closure **98** of the strip **206**. By pinching this label, indexer arm **107** holds the closure to which said label is glued against forward movement when the foremost closure is pulled from the machine, with the bag to which it has been applied.

The machine **30** will now function to apply a label bearing closure to a bunched bag neck by almost exactly the same cycle as previously described for applying a naked closure. The difference between the two cycles is found in the mode of indexing the next to the foremost closure to prevent its yielding to the pull applied thereto in withdrawing the foremost closure from rocker **90**. This mode is necessarily different because the closures **98** in strip **206** are covered by the labels **207** and application of indexer lug **111** to the labels would deface these. This is why the indexing function in applying label bearing closures in machine **30** is performed by the smooth elbow **108** of indexer arm **107** being applied to the label **107** which is glued onto the next to the foremost closure in strip **206** as shown in FIG. **24**.

If the printing device **116** is used when applying label equipped closures to bags in operating the machine **30**, the imprint must be made on successive labels of the strip **206** as this is fed beneath the printer.

To clear the machine of label bearing closures in order to return to the application of bare closures to bags, the same procedure is followed as in clearing the machine of a strip **200** of bare closures and described above, excepting that the indexer arm **107** is now lifted from behind its shaft **106** and rocked forwardly over that shaft before applying the neutralizer latch **139** to cam arm **170** to neutralize the indexer arm **107** during the withdrawal of the label bearing closure strip **206** from the guide channel **49**. This withdrawal operation

having been completed, the standard **196** is rotated **180°** to return it to the position in which this is shown in FIG. **1**. This brings the bare closure strip **200** in alignment with the strip guide channel **49** whereby the strip **200** may now be threaded into said channel as above described to ready the machine **30** for applying bare closures to plastic bags.

I claim:

1. In a device for applying to a bunched bag neck, or the like, a closure made of stiff but springy sheet plastic and having a narrow forward opening connecting with an inner aperture to form jaws which resist escape of a bag neck enclosed within said aperture, the combination of:

a rocker pivoted on an axis and having a slot parallel with and close to said axis and extending through said rocker transversely of said axis, said slot being adapted to receive and closely confine one of said closures with the forward opening thereof at an end of said slot which is relatively remote from said axis,

said rocker having also formed therein, intersecting said slot, a bag neck receiving recess,

said recess admitting a bunched bag neck into close proximity with said closure and guiding the bag neck into longitudinal alignment with the opening and aperture of said closure, and

means for rocking said rocker toward a bunched bag neck held stationary in said recess, while a closure is trapped in said slot, to cause said rocker to flex the jaws of said closure about said neck thereby applying said closure to said bag neck.

2. The combination recited in claim **1** wherein are provided

powered cycle means which successively

rocks said rocker from a primary position to a secondary position thereby applying a closure already in said rocker to a bunched bag neck held in said recess,

halts operation of said means pending withdrawal of said bag neck and applied closure from said rocker, and then

resumes operation to feed another closure into said rocker, reversely rock said rocker to said primary position and halt operation of said means.

3. The combination recited in claim **2** wherein is provided

trigger means responsive to introduction of a bunched bag neck into said rocker recess to start said powered cycle means in the performance of a new bag closing cycle.

4. In a device for applying to a bunched bag neck, or the like, a closure made of stiff but springy sheet plastic and having a narrow forward opening connecting with an inner aperture to form jaws which resist escape of a bag neck enclosed within said aperture, the combination of:

a rocker pivoted on an axis, said rocker being shaped to receive one of said closures to support the same in a plane parallel with and close to said axis, said support being applied to said closure along the side edges thereof but leaving a free space beneath said jaws, said rocker also being shaped to leave a free space in axial alignment with and directly above said closure to accommodate a bunched bag neck aligned with said closure and held stationary in juxtaposition therewith, and

means for rocking said rocker while said space above said closure is occupied by such a stationary bunched bag neck to rotate said closure about said axis and towards said bunched bag neck to apply said jaws to opposite sides of the latter whereby said jaws are flexed around said bunched bag neck to trap the latter in said aperture.

5. The combination recited in claim **4** wherein are provided

means responsive to the juxtaposing of a bunched bag neck in overlying relation with said closure to set in motion said means for rocking said rocker to apply said closure to said bunched bag neck.

6. The combination recited in claim **5** wherein are provided

means for automatically delivering another closure into said supported relation with said rocker at the close of each cycle in which said rocker has been rocked to apply a closure to a bunched bag neck.

7. The combination recited in claim **4** wherein

said rocker is adapted to receive and support a closure having a label glued thereon and apply said closure to a bunched bag neck as recited without disturbing the connection between said closure and label.

8. The combination recited in claim **6** wherein

printing means is associated with said closure feed means whereby said closures are automatically printed on as they are fed towards said rocker so that each said closure has an indicia printed thereon by said means when it is applied to a bunched bag neck.

9. The combination recited in claim **4** wherein

said rocker is provided with slot means in the plane in which said rocker supports said closure along the side edges thereof,

said slot means extending transversely through said rocker, a closure receiving end of said slot means being located close to said axis,

said slot means having a lengthwise dimension approximately equal to that of said closure.

10. The combination recited in claim **9** wherein

said rocker is positioned to incline said slot means and a closure confined therein downwardly at the start of a closure applying cycle, and is positioned with said slot means approximately horizontal at the point in said cycle where said closure has been applied to said bag neck,

means for feeding a closure into said slot means, and

means automatically causing said closure feed means to function immediately following the withdrawal from said slot means of a closure applied to a bag neck to feed another closure into said rocker and to do this while said slot means is still approximately horizontally disposed.

11. The combination recited in claim **10** wherein

said closure feed means embraces a horizontal guide means having a guide channel for guiding a strip of said closures, united end to end by frangible webs, on the same level as the receiving end of said slot means when the latter is approximately horizontally disposed, whereby

a foremost closure of said strip is fed directly from said channel into said slot means of said rocker.

12. The combination recited in claim **11** wherein

automatic indexing means is provided to hold the next closure in said strip from forward movement while the foremost closure, just applied to a bag neck, is being withdrawn from said rocker by pulling on said bag neck and thus parting the webs connecting it to said next closure.

13. The combination recited in claim **12** wherein

a strip guide plate yieldably overlies said strip guide channel to confine said strip therein,

said strip yielding to slidably admit labels glued on upper faces of the closures of said strip and substantially wider than said closures,

said slot means in said rocker providing a central, closure accommodating guide way, therebeing

laterally extending slots in said rocker for accommodating said labels.

14. The combination recited in claim **13** wherein said indexing means includes

a lug extended by said means into a void in said closure strip, when a strip of bare closures occupies said guide channel, and

a smooth braking surface pressurally applied by said

indexing means to a label carried by a next-to-the-foremost closure of a strip of label carrying closures occupying said guide channel.

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