March 13, 1962 J. E. CLEMENS ETAL 3,025,054

TAG ATTACHING MACHINES

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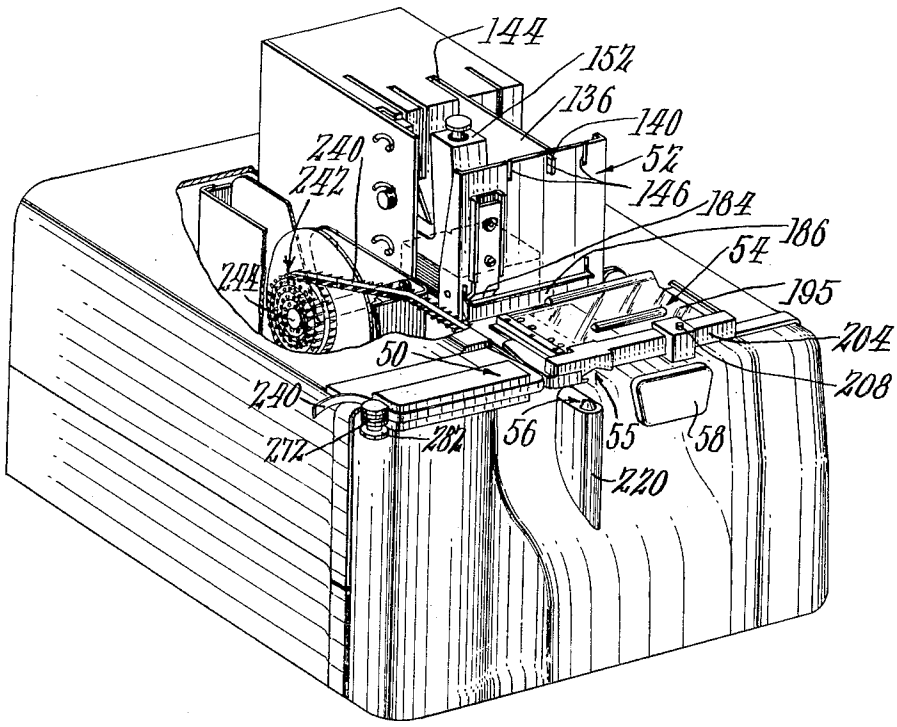
8 Sheets-Sheet 1

Fig. 1



Inventors

John E. Clemens
Roger A. Delabar
James D. Ray
By their Attorney

Vincent A. White

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Fig. 2

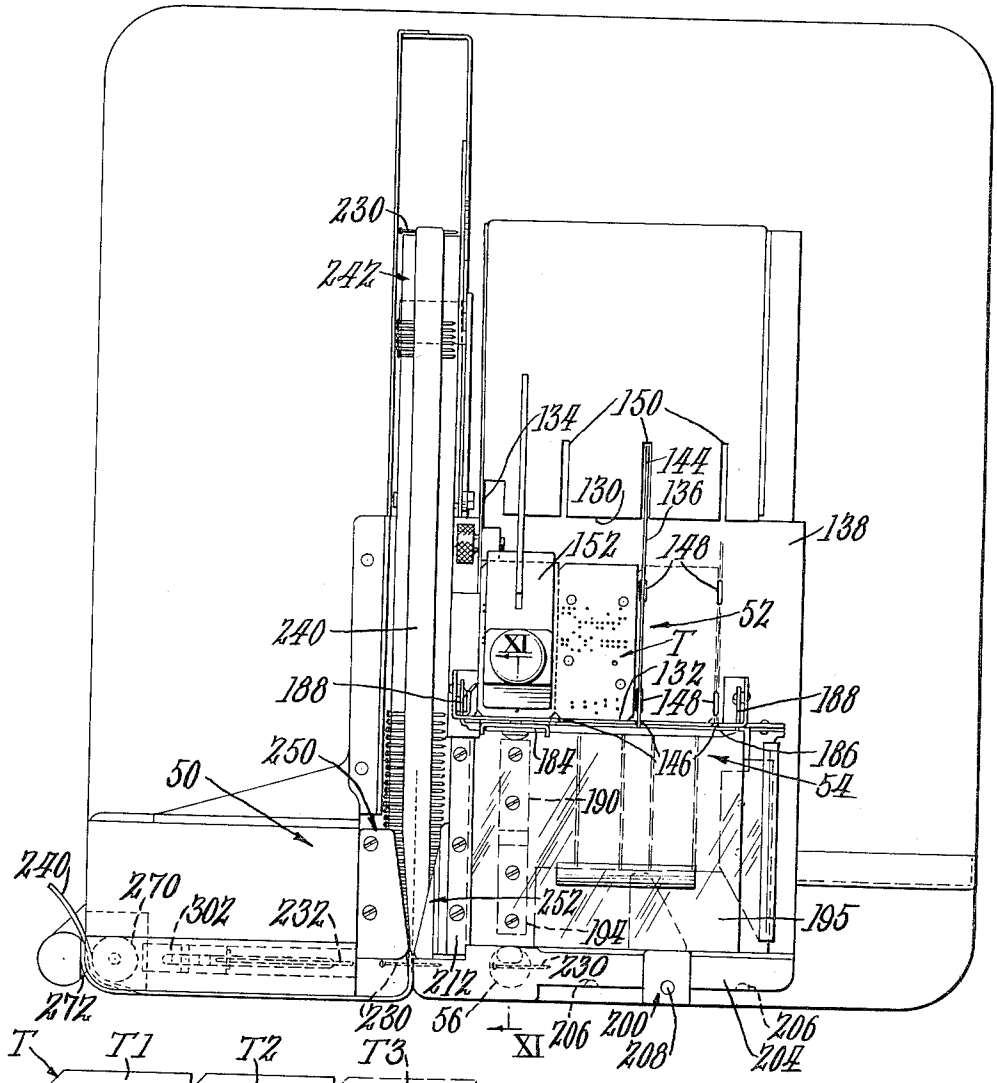
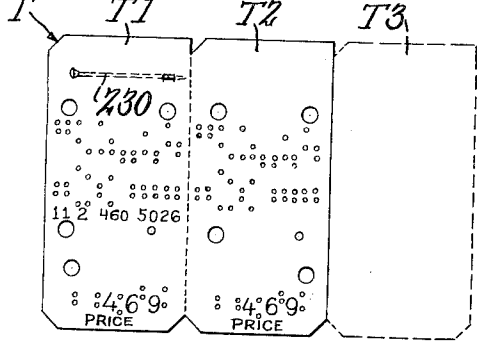


Fig. 3



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TAG ATTACHING MACHINES

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Fig. 4

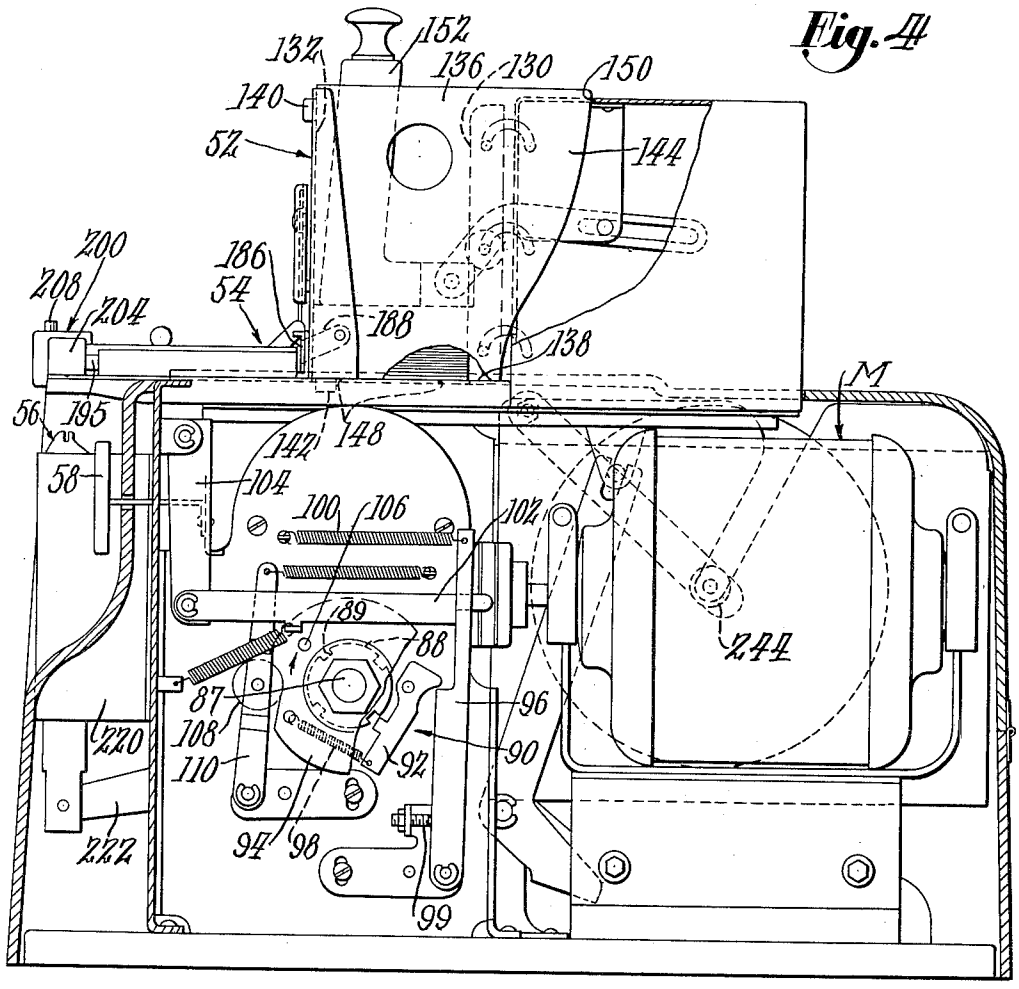

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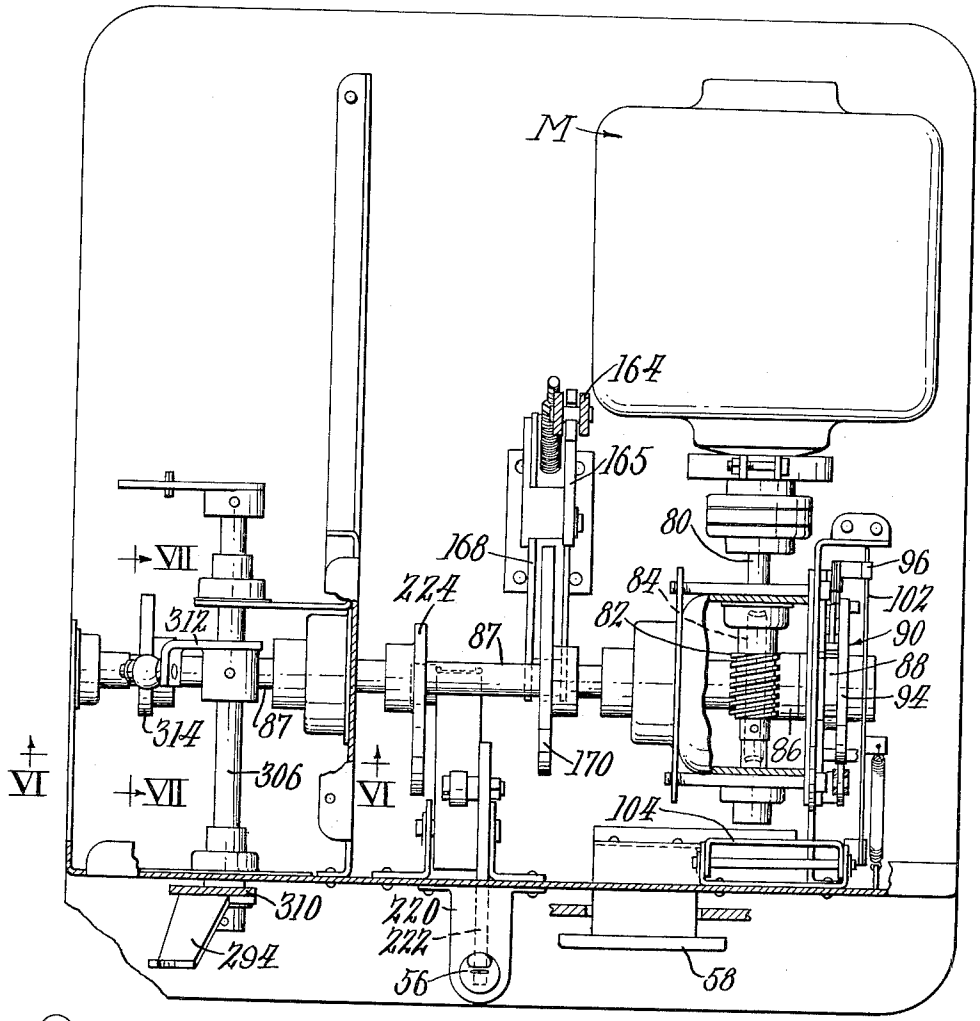
Fig. 5



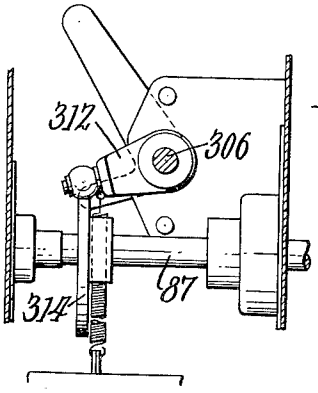
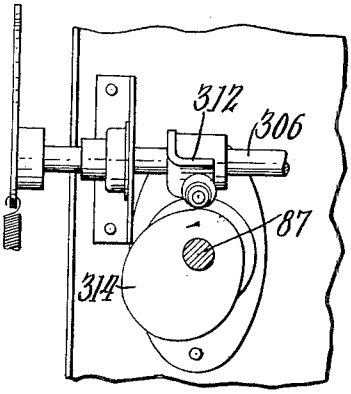


Fig. 6

Fig. 7



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TAG ATTACHING MACHINES

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Fig. 8

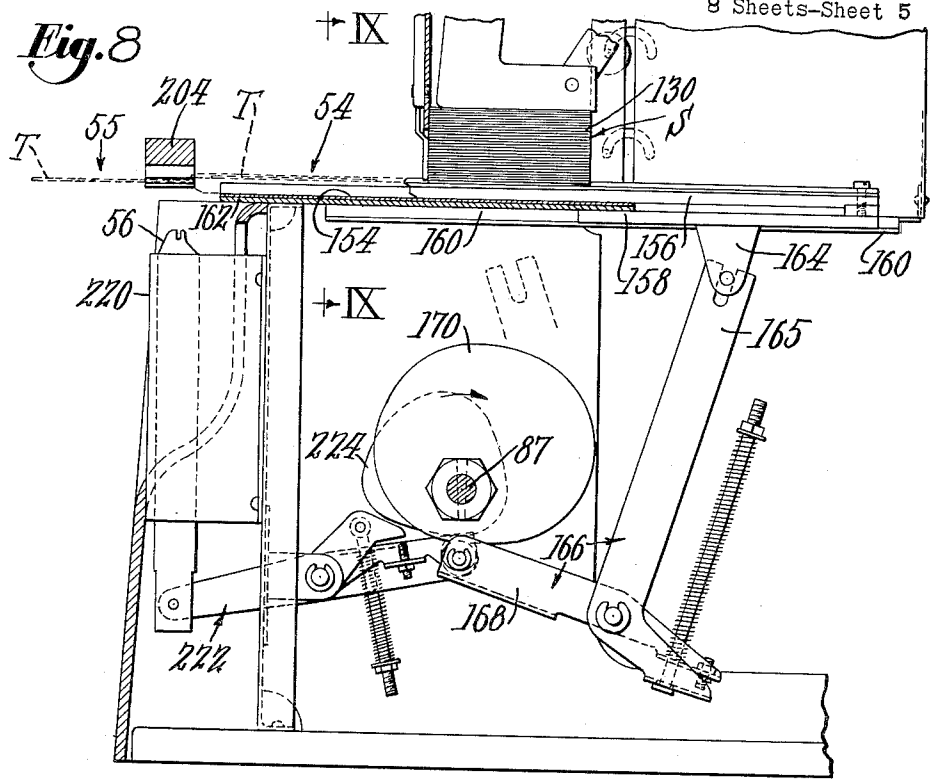

Fig. 9

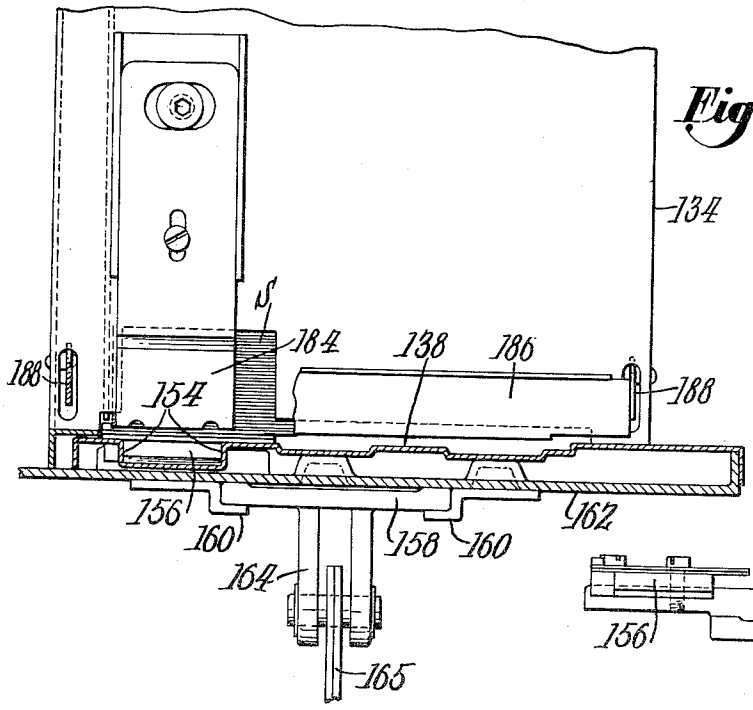

Fig. 10

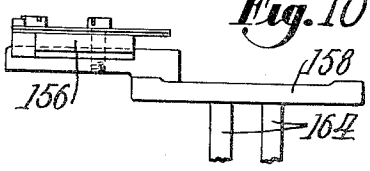

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Fig. 12

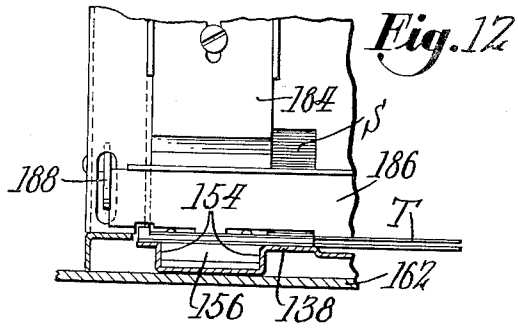


Fig. 11

Fig. 13

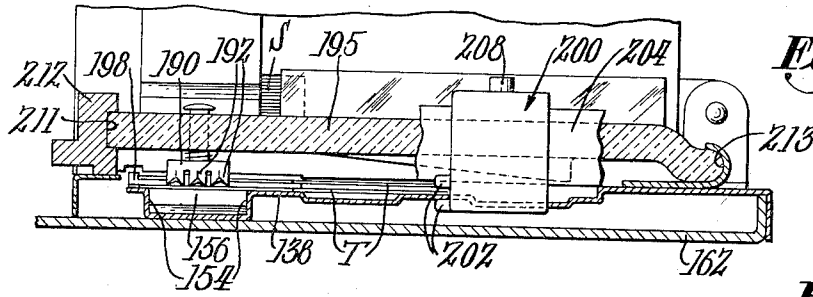


Fig. 14

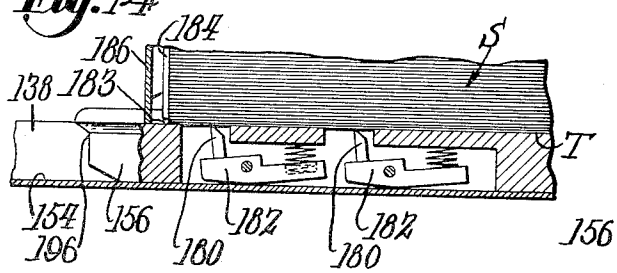
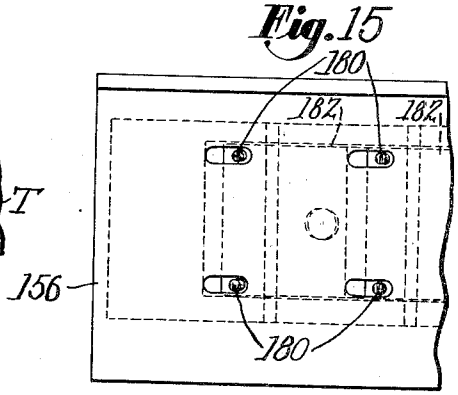


Fig. 15



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TAG ATTACHING MACHINES

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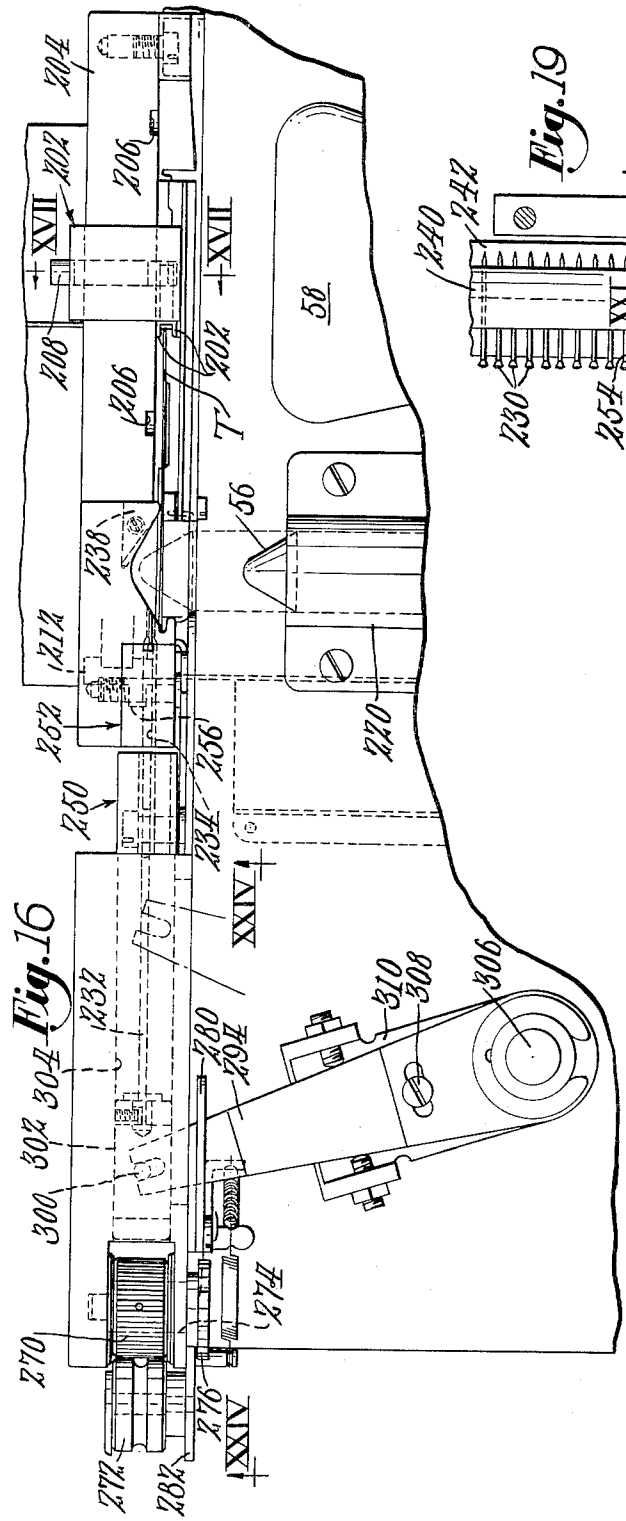

Fig. 16

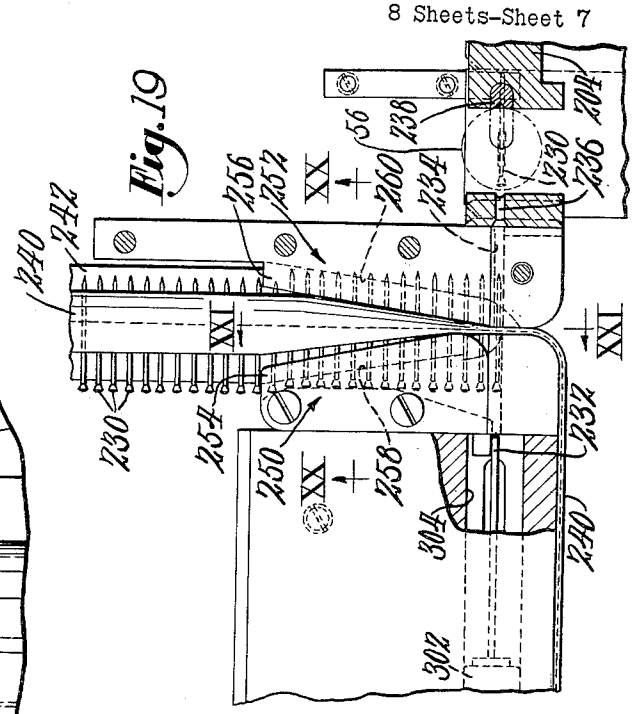

Fig. 19

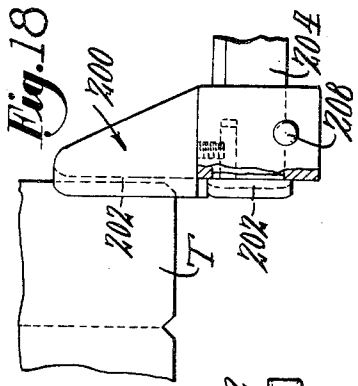

Fig. 18

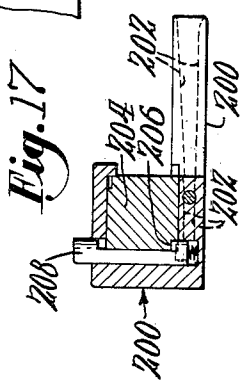

Fig. 17

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Fig. 20

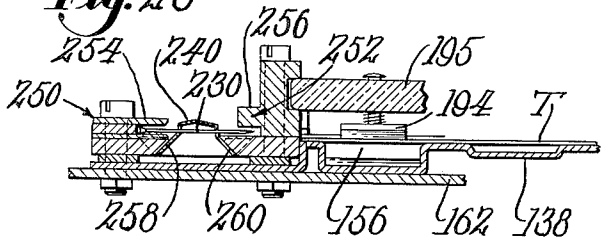


Fig. 21

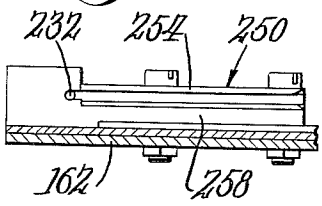


Fig. 22

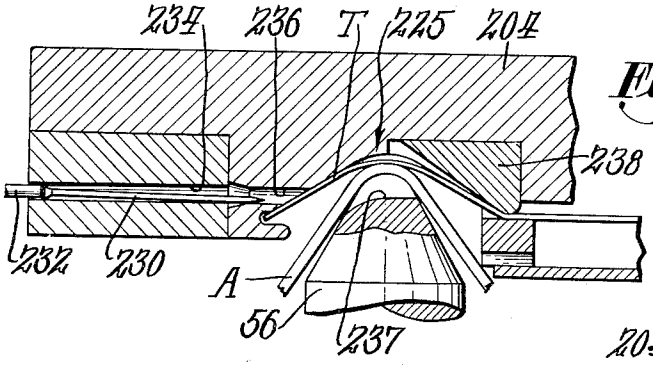


Fig. 23

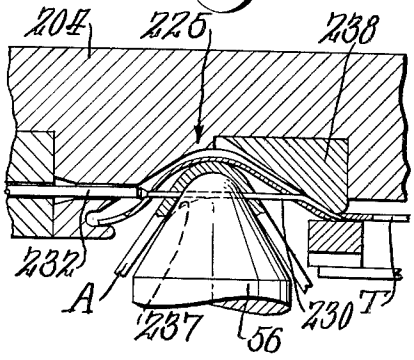
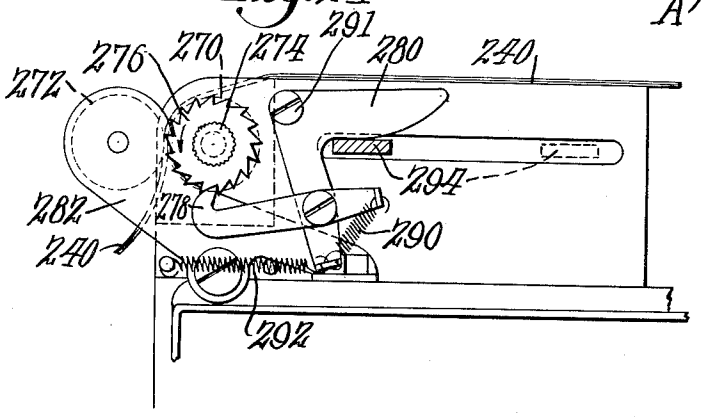


Fig. 24



United States Patent Office 3,025,054 Patented Mar. 13, 1962

3,025,054

TAG ATTACHING MACHINES

John E. Clemens, Xenia, Roger A. Delabar, Springfield, and James D. Ray, Wilmington, Ohio, assignors to A. Kimball Company, Brooklyn, N.Y., a corporation of New York

Filed July 14, 1959, Ser. No. 827,079
4 Claims. (Cl. 271—44)

This invention relates to machines for attaching tags to articles. More particularly the invention is directed to devices for separating and feeding individual tags from a stack in preparation for an attaching operation.

Machines of this type are commonly in use but generally are adapted for handling tags in strip form. Many tags, however, are precut and handled in stacks prior to attachment. When stacked, such as in a hopper, it is impossible for an operator to determine that information printed on the tags properly relate to the articles to which they are to be attached. Another problem concerned with handling precut stacked tags arises in reliably separating each tag individually from a stack so that each tag fed from the hopper is exposed for visual checking before attachment. Alternatively, it may be desirable to perform an additional operation, such as printing, before the tag is attached. In overcoming the above problems it was found that hopper feeding devices presently in use were not suited for such an operation.

Accordingly, it is an object of the invention to provide a machine in which tags are fed individually from a stack to an intermediate station before being fed to an attaching station.

Another object of the invention is directed to the provision of devices for reliably separating and feeding individual tags from a stack. To this end and in accordance with a feature of the invention, the machine is provided with a hopper which is adjustable for accommodating tags of different sizes. The lowermost tag in the hopper rests on a slide which is reciprocable and which is provided with means for affixing the tag to the slide during movement in one direction to separate the tag from the stack and feed it from the hopper to an intermediate station. During movement of the slide in the opposite direction the tag is released from the slide and restrained against retrograde movement.

According to another feature of the invention the affixing means comprises needles which are operative to engage the tag during movement of the slide in one direction and which are retractable during movement in the opposite direction.

Another feature of the invention provides for exposure of the tag at the intermediate station for visual checking or for the performance of an additional operation. Also while at this station the tag is depressed into the path of movement of the slide so that during the next cycle of operation the tag is fed by the leading edge of the slide from the intermediate station to an attaching station.

The above and other features of the invention including various details of construction and novel combinations of parts will now be described with reference to the drawings and thereafter pointed out in the claims.

In the drawings,

FIG. 1 is a perspective view of one form of machine embodying the invention;

FIG. 2 is a plan view of the machine;

FIG. 3 shows a tag which may include one or more parts;

FIG. 4 is a side elevation with portions of the casing broken away;

FIG. 5 is a plan view with the top portion of the machine removed;

FIG. 6 is a section on the line VI—VI of FIG. 5;

FIG. 7 is a section on the line VII—VII of FIG. 5;

FIG. 8 is a sectional elevation showing the tag hopper and feeding mechanism;

FIG. 9 is a section generally taken along the line IX—IX of FIG. 8;

FIG. 10 is a view showing a portion of the mechanism in FIG. 9;

FIG. 11 is a sectional view on the line XI—XI of FIG. 2;

FIG. 12 is a section along the line XII—XII of FIG. 11;

FIG. 13 is a section generally along the line XIII—XIII of FIG. 11;

FIG. 14 is a view partly in section of the means for separating the bottom tag from the hopper;

FIG. 15 is a plan view of the means shown in FIG. 14;

FIG. 16 is a front elevation in enlarged scale of a portion of the machine;

FIG. 17 is a section on the line XVII—XVII of FIG. 16;

FIG. 18 is a plan view of the mechanism shown in FIG. 17;

FIG. 19 is a plan view partly in section of the pin handling mechanism;

FIG. 20 is a section along the line XX—XX of FIG. 19;

FIG. 21 is a section generally along the line XXI—XXI of FIG. 19;

FIGS. 22 and 23 are sections showing progressively the driving of a pin for fastening a tag to an article; and

FIG. 24 is a bottom view taken generally along the line XXIV—XXIV of FIG. 16.

The machine is generally illustrated in FIGS. 1, 2 and 4, and includes a pin feeding and handling mechanism **50**, a tag hopper **52** with its associated tag feeding mechanism, an intermediate station **54** at which a tag to be attached is exposed, and an attaching station **55** having a plunger mechanism **56** to position the tags and articles to which they are to be attached. In order to pin a tag to an article the operator places the article over the plunger **56** at the attaching station **55** and thereafter operates a start button **58** to initiate a single cycle of the machine. During such cycle a tag is fed from the intermediate station **54** to the attaching station **55** and into position over the plunger with the article thereon. The plunger rises to bend the article and tag, and a pin is driven through the tag and article.

Referring to FIGS. 4 and 5, it may be seen that power is supplied to drive the various mechanisms of the machine by a motor M which is constantly operating whenever the machine is to be used. The motor is connected to a shaft **80** (FIG. 5) having fixed thereto a worm **82** which drives a worm gear **84**. The gear is fixed to a sleeve **86** which rotates freely on a cam shaft **87** and which also has formed thereon a flange **88**. Thus, whenever the motor M is operating, the flange **88** is constantly rotating and forms the driving portion of a clutch **90**. The driven portion of the clutch includes a pawl **92** (FIG. 4) pivotally mounted on a generally circular plate **94** secured to the cam shaft **87**. The pawl is provided with a lug adapted to be received in one of four notches **89** in the flange **88** and is also provided with a tailpiece which is engaged by a latch **96** to hold the pawl against the action of a spring **98** and disengaged from the flange **88**. When the clutch is disengaged, as seen in FIG. 4, the latch is held against a stop **99** and in engagement with the pawl by a spring **100**. Near its upper end the latch **96** is slotted to receive one end of a bar **102** having a shoulder engaging the forward side of the latch. The bar **102** at its opposite end is connected to the lower end of an arm **104** which also has fixed thereto the start

button 58. It is apparent from FIG. 4, that rearward movement of the start button causes the latch 96 to be disengaged from the pawl 92 allowing the pawl to engage one of the notches in the flange 88 to drive the cam shaft 87. Rotation of the plate 94 causes a pin 106 projecting from the plate to raise the bar 102 so that its shoulder releases the latch 96 for engagement with the tailpiece of the pawl at the end of a single revolution of the plate 94. To prevent overthrow of the clutch and to ensure that the cam shaft always stops in the same position, the periphery of the plate 94 is provided with a depression adapted to receive a detent roll 108 when the shaft 87 is in its stop position, the roll being carried by a spring biased arm 110.

The tag hopper will now be described with particular reference to FIGS. 2, 4, 9 and 12–15. As illustrated, the hopper forms a receptacle for a stack S of tags T which may include one, two or three parts T1, T2, and T3, as seen in FIG. 3. The hopper comprises a rear wall 130, a front wall 132, a fixed side wall 134, an adjustable side wall 136 and a platform 138. The wall 134 is open for a considerable portion of its height to facilitate loading and removal of a stack of tags. The adjustable wall 136 is formed by a removable plate having tabs 140, 142 and 144 which are received in any one of a plurality of sets of slots 146, 148 and 150, respectively. As seen in FIG. 2, the wall 136 is placed for guiding tags having two parts T1 and T2. The bottom tag of the stack rests on the platform 138 (FIG. 4) with a weight 152 resting on the top of the stack.

The platform 138 is provided with a slideway 154 adapted to receive a T-shaped slide 156 which, as best seen in FIGS. 8–11, is secured to an underlying parallel but offset slide 158. The slide 158 is guided for forward and rearward reciprocating movements by a pair of ways 160 fixed to a plate 162 supporting the platform 138. The slide 158 is provided with depending ears 164 which are connected by a pin and slot connection to one arm 165 (FIG. 8) of a yieldable two-piece lever forming a bell crank 166. Another arm 168 of the bell crank carries a roll which rides on the periphery of a cam 170 fixed to the cam shaft 87. As is apparent from FIG. 8, one revolution of the cam shaft 87 causes the slides 156 and 158 to be moved forward to the intermediate tag station 54 as indicated in broken lines and to be returned to the hopper as indicated in full lines. Referring to FIGS. 14 and 15, the slide 156 is provided with needles 180 pointed in the feed direction and carried in spring biased rocking arms 182 pivoted in the slide. As seen in FIG. 14, the pointed ends of the needles engage the bottom tag T of the stack S in the hopper. During forward movement of the slide 156 the bottom tag is fixed to the slide by engagement with the needles and is fed forwardly from the hopper through a slot 183 formed in the forward wall of the hopper by an adjustable plate 184 which allows only the lowermost tag to be moved from the hopper. The leading edge of the tag, as it is fed forward, engages and lifts a gate 186 (FIG. 11) having ears 188 pivotally mounted to the side walls of the hopper. After passage of the tag, the gate drops behind the tag to prevent accidental return of the tag to the hopper. During its forward movement, the tag moves under a spring-pressed plate 190 which at its forward end is provided with a plurality of pointed portions 192, and also moves under a spring-pressed plate 194. During the return movement of the slide 156 retrograde movement of the tag is prevented by the pointed portions 192 of the plate 190 and when the slide 156 has been fully returned to the hopper, spring pressure acting through the plates 190 and 194 causes the tag to drop to a lower level onto portions of the support 138 so that the tag T is positioned at the intermediate station 54 as shown in FIGS. 11 and 13. The plates 190, 194 are yieldingly mounted on a transparent plate 195 which is removably mounted as seen in FIGS. 11 and 13. Thus, when positioned at the intermediate station, the tag to be attached on the next cycle of the machine is visible to the operator. While in the embodiment illustrated, the intermediate station is utilized for checking the tag before attaching, it should be obvious that suitable mechanism could be placed at the station for performing an operation such as printing before the tag is attached.

During the next cycle of the machine in which the slide 156 is moved forward to feed another tag out of the hopper to the intermediate station, the leading edge 196 (FIG. 11) of the slide engages the previously fed tag at the intermediate station and moves the tag to the attaching station indicated at 55 in FIG. 8. Thus it may be seen from the foregoing, that each individual tag is moved successively from the tag hopper to the intermediate station outside of the hopper during one cycle of the machine and then during the next cycle is moved to the attaching station where the tag is pinned to the article positioned over the plunger 56. During the forward movements of the tag, one edge is guided by a shoulder 198 of the slide 156 (see FIG. 13) and the other edge of the tag is guided by an adjustable edge guide 200. The guide is provided with a groove 202 which confines the tag in edgewise and heightwise directions. For adjusting the guide 200 to accommodate tags having various number of parts (see FIG. 3), the guide is slidably mounted on a horizontal bar 204 (FIGS. 2 and 16–18) which is provided with a plurality of notches 206 adapted to receive a portion of a spring-pressed plunger 208 mounted in the guide 200, as seen most clearly in FIGS. 16 to 18. Thus to adjust the guide 200 for accommodating tags having a predetermined number of parts, the operator first depresses the plunger 208 for release from one of the notches 206 and then moves the guide along the bar 204 until the plunger reengages a notch 206 in the appropriate position whereupon the plunger locks the guide on the bar 204.

When the tag has been moved to the attaching station 55, as indicated in broken lines in FIG. 8, the rearward edge of the tag is positioned over the plunger 56. The plunger is mounted for heightwise sliding movements in a guide block 220 carried by a portion of the machine frame. At its lower end the plunger is connected to a two-piece yieldable lever 222 which at its rearward end carries a cam roll riding on the periphery of a cam 224 fixed to the cam shaft 87. It is apparent from the shapes of the cams 170 and 224 in FIG. 8 that as soon as the cam shaft commences rotation the slide 156 is moved forward to feed a tag from the intermediate station to the attaching station over the plunger 56 during which time a dwell on the cam 224 maintains the plunger in its lowermost position. Thereafter, the plunger is moved upwardly to press an article A (see FIGS. 22 and 23) placed over the plunger 56 up into engagement with the tag T, the tag and article being bent into the positions generally indicated in FIG. 22 against an anvil portion 225 formed in the bar 204. While in this position, a pin 230 is moved by a driver 232 through guide passes 234, 236 and, through the tag T and article A to the position shown in FIG. 23, the pin passing through a groove 237 in the plunger 56. The pointed end of the pin 230 is deflected near the end of its movement by a hardened anvil 238 in the bar 204 in a direction which causes the pointed end of the pin to be embedded in the tag T.

The pins 230 are fed into driving position on a strip 240 (FIGS. 1 and 2) from a roll 242 carried by a spindle 244 projecting from one side of the hopper. The strip is fed forwardly between two guides 250 and 252 (FIGS. 19 and 20), the guide having flanges 254, 256 which overlie the heads and points of the pins, respectively. The guide 250 has a groove which receives the headed ends of the pins and acts to align all heads of the pins as they are fed forwardly, the guide 252 also being provided with a similar groove for receiving the pointed ends of the pins. The guides 250 and 252 are provided with

plow shaped guide surfaces **258, 260**, respectively, which act to fold the paper strip upon itself along an incised line. During each cycle of the machine, the paper strip is fed intermittently, by means to be described, a sufficient distance to move one pin into alignment with the driver **232** and guide passage **234**.

The means for feeding the paper strip includes a serrated roll **270** (FIGS. 16 and 24) and a pressure roll **272** between which the folded strip is directed, as seen in FIGS. 2 and 24. The roll **270** is provided with a stub shaft **274** (FIG. 24) to which is fixed a ratchet wheel **276**. A pawl **278** carried by a bell crank **280** co-acts with the ratchet wheel to drive the feed roll **270** in a counterclockwise direction, as seen from below in FIG. 24, to feed the paper strip in uniform increments. The pressure roll **272** which holds the folded strip in close engagement with the feed roll **270** is carried by an adjustable bracket **282** secured to the underside of the feed mechanism. The pawl **278** is pivotally mounted on one arm of the bell crank **280** and is held in engagement with the ratchet wheel **276** by a spring **290**. The bell crank is fulcrumed at **291** and is urged in a clockwise direction by a spring **292** to maintain the other arm of the bell crank in engagement with one side of an arm **294**. As will presently appear, the arm **294** is moved from the full line position to the broken line position, as seen in FIG. 24. The spring **292** causes the bell crank **280** to move clockwise, as seen in FIG. 24, when the arm **294** moves out of engagement with the bell crank, thus also causing the pawl **278** to engage another tooth on the ratchet wheel. During the return movement of the arm **294**, the bell crank is moved counterclockwise causing the pawl to rotate the ratchet wheel and feed roll **270** for moving the paper strip to feed another pin into alignment with the driver. The arm **294** (FIG. 16) at its upper end is slotted to receive a pin **300** carried by a driver block **302**. The driver block is mounted for reciprocating movements in a bore **304** coaxial with the passage **234** and has fixed thereto the driver **232**. The lower end of the arm **294** is pivotally mounted on a shaft **306** journaled in a portion of the machine frame. The arm is adjustably secured by means of a screw **308** to an arm **310** fixed to the shaft **306**. As best seen in FIGS. 5–7, the shaft **306** has fixed thereto an arm **312** which has a cam roll riding on the periphery of a cam **314** fixed to the cam shaft **87**. Thus, during one cycle of the cam shaft and through the arms **312** and **294**, the driver is moved to the right, as seen in FIG. 16, to drive a pin **230** through the paper strip **240** and through the passageways **234, 236** and into the tag and article positioned over the plunger **56**. During such movement of the driver, the pawl **278** (FIG. 24) moves over one tooth of the ratchet wheel **276**. During the return movement of the arm **294**, the driver is retracted to the left, as seen in FIG. 16, and the bell crank **280** is moved counterclockwise to drive the feed wheel **270** causing the pin strip to be advanced to carry another pin into driving position.

The general operation of the machine will now be described. It will be assumed that the hopper **52** has been loaded with the proper type of tags to be attached to particular articles and that a tag has been fed to the intermediate station as shown in broken lines in FIG. 8. While in such station the operator can visually check the tag to be attached. It should be obvious that while at this station any additional operation such as printing could be performed with addition of suitable equipment. The operator places an article to which a tag is to be attached over the plunger **56** and thereafter moves the start button **58** rearwardly to cause the clutch **90** to be engaged for rotating the cam shaft **87** one complete cycle. As soon as the shaft begins to rotate, the cam **170** (FIG. 8) causes the bell crank **166** to be rocked counterclockwise moving the slide **156** forwardly. During such movement, the forward end of the slide engages the tag in the intermediate station moving the tag forward to the attaching station over the article positioned on the plunger **56**. At the same time another tag is fed from the hopper to the intermediate station. At the end of the forward movement of the slide **156** the cam **224** acting through the arm **222** moves the plunger **56** and the article thereon up into engagement with the tag, bending the tag to the position shown in FIG. 22. The cam **314** thereupon acts on the arm **312** to rock the arm **294** clockwise, as seen in FIG. 16, to move the driver **234** to the right to drive a pin **230** through the passages **234, 236**. The pin thereupon is driven through the bent tag and article, the point of the pin being deflected by the anvil **238** into the tag, as seen in FIG. 23. During such movement the pin passes through the groove **237** in the plunger **56**. During the clockwise movement of the arm **294** the pawl **278** moves over a single tooth of the ratchet wheel so that when the arm returns to its initial position, the feed roll **270** will be rotated to feed another pin into driving position.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. A tag feeding and separating device comprising a hopper for holding a stack of tags, a slide engaging the bottom tag in said stack, means for reciprocating the slide in directions edgewise of said tag, means for affixing the tag to the slide during movement in one direction for causing the tag to be separated from the stack and fed from the hopper, said affixing means being released from the tag during movement in the opposite direction, and means acting on the tag after it is fed from the hopper for depressing said tag into the path of movement of the slide upon return of the slide to its initial position for causing the leading edge of the slide to engage an edge of said tag during its next cycle of movement to impart an additional feeding movement to said tag.

2. A tag feeding and separating device comprising a hopper for holding a stack of tags, a slide engaging the bottom tag in said stack, means for reciprocating the slide in directions edgewise of said tag, means for affixing the tag to the slide during movement in one direction for causing the tag to be separated from the stack and fed from the hopper, said affixing means being released from the tag during movement in the opposite direction, and means acting on the tag after it is fed from the hopper for preventing retrograde movement of the tag during the return movement of the slide, said preventing means also acting to depress said tag into the path of movement of the slide upon return of the slide to its initial position whereby the leading edge of the slide engages an edge of said tag during its next cycle of movement to impart an additional feeding movement to said tag.

3. In a machine having a delivery station, a hopper for holding a stack of precut tags, and an intermediate station at which an individual tag is exposed before being fed to the delivery station, intermittent tag feeding means including a slide on which rests the bottom tag in said hopper, means for moving said slide between the hopper and the intermediate station, needles in said slide, means for causing said needles to engage said tag for fixing the tag to the slide during forward movement of the slide toward said intermediate station and for causing said needles to be disengaged from the tag during return movement of the slide toward the hopper whereby the bottom tag in the hopper is separated from the stack in the hopper and fed to the intermediate station during the forward movement of the slide, and means at said intermediate station for depressing said tag into the path of movement of the leading edge of said slide during the return movement of the slide whereby during the successive cycles of movement of the slide tags are fed by engagement of the needles from the hopper to the intermediate station for exposure and thereafter are fed

by engagement with the leading edge of the slide to the delivery station.

4. In a machine having a delivery station, a hopper for holding a stack of precut tags, and an intermediate station at which each individual tag is exposed before being fed to the delivery station, tag feeding means including a slide underlying said hopper and movable between the hopper and the intermediate station, rocking needles in said slide engageable with the bottom tag in the hopper fixing said tag to the slide during movement from the hopper to the intermediate station, said needles rocking out of engagement with the tag during the return movement of the slide to release the tag from the slide, said slide also having a leading edge engageable with the trailing edge of a tag at the intermediate station whereby during another cycle of movement of the slide the tag at the intermediate station is moved by

said edge to the delivery station while another tag is simultaneously fed from the hopper by said needles.

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