Oct. 5, 1943. S. E. VAN TUYL 2,331,251

TAG PRINTING MACHINE

Filed Aug. 29, 1941 3 Sheets-Sheet 1

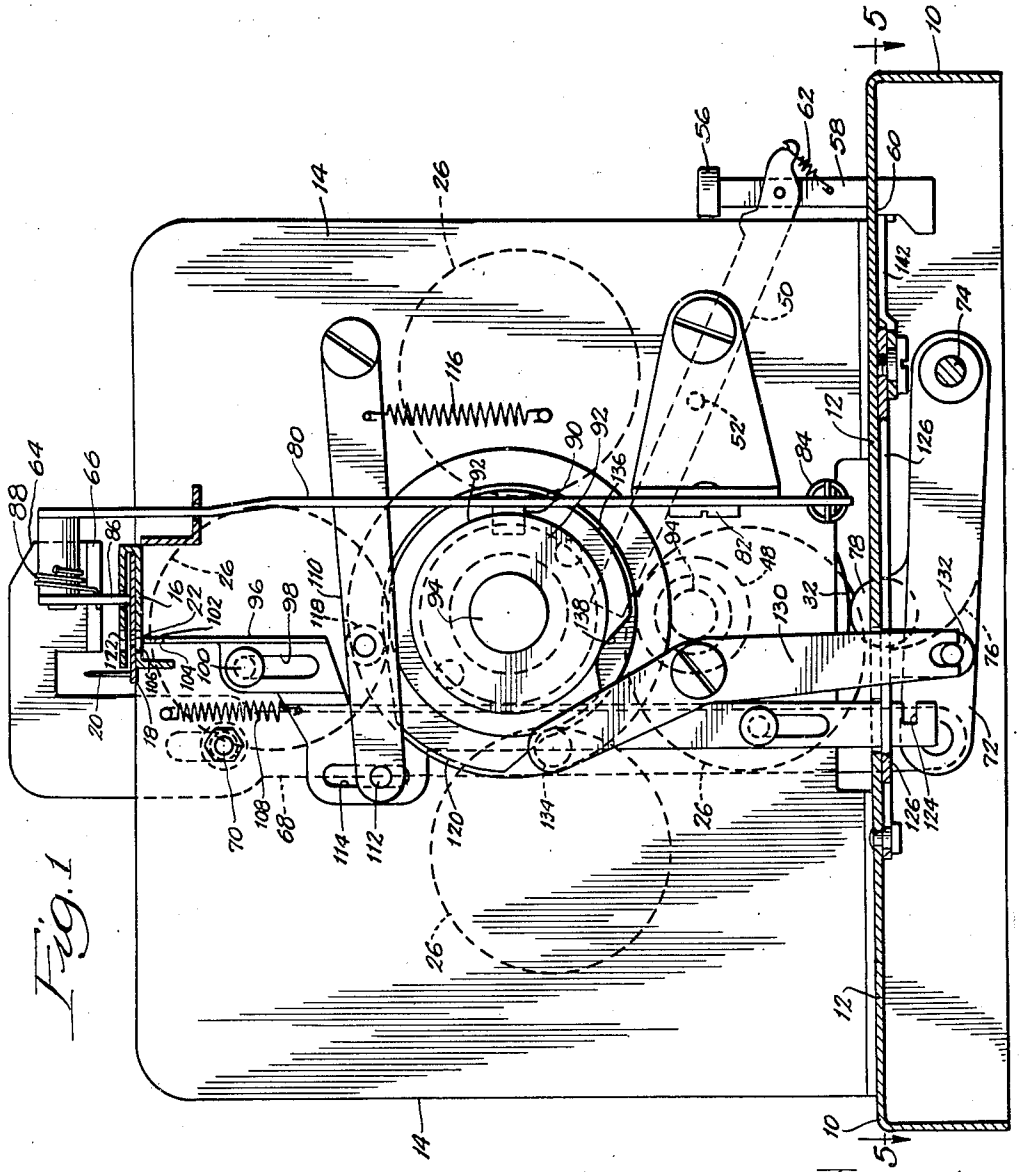


Fig. 1

Inventor:
Sidney Van Tuyl,
By Dawson Coms & Booth
Attorneys.

Oct. 5, 1943. S. E. VAN TUYL 2,331,251

TAG PRINTING MACHINE

Filed Aug. 29, 1941 3 Sheets-Sheet 2

Fig. 2

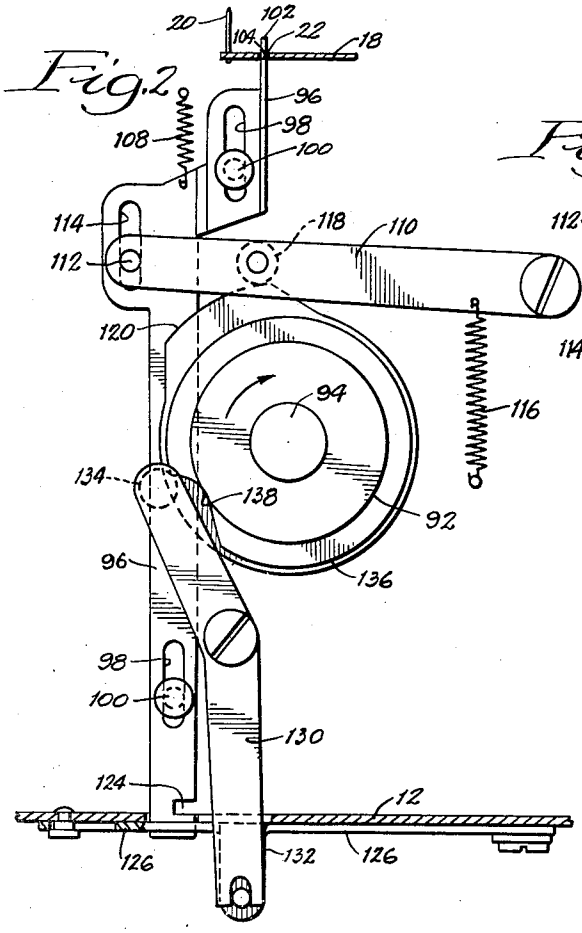


Fig. 3

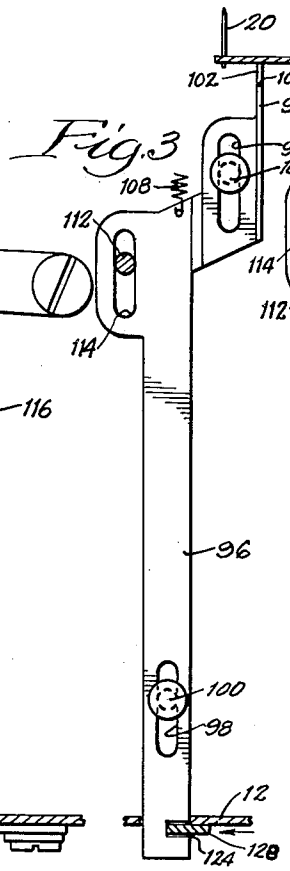


Fig. 4

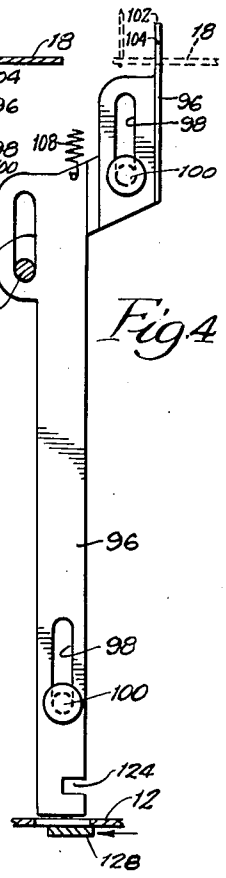
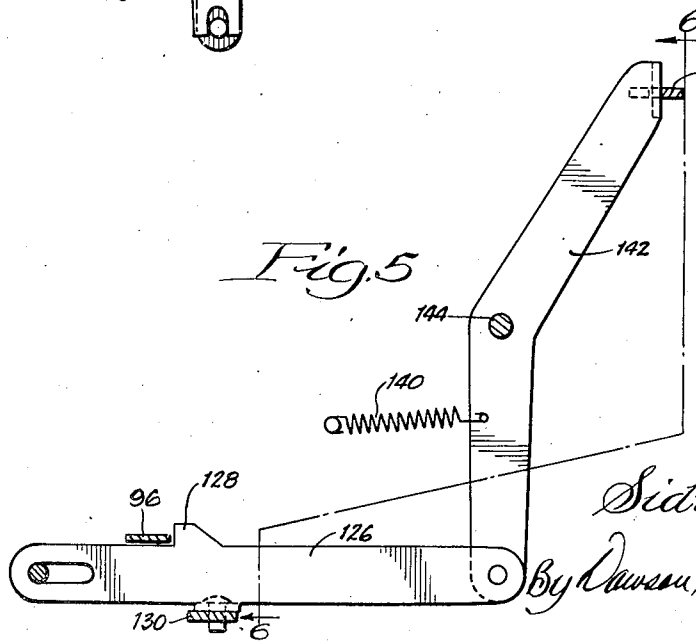


Fig. 5



Inventor:
Sidney Van Tuyl,
By Dawson, Owens & Booth,
Attorneys.

Oct. 5, 1943. S. E. VAN TUYL 2,331,251

TAG PRINTING MACHINE

Filed Aug. 29, 1941 3 Sheets-Sheet 3

Fig. 6

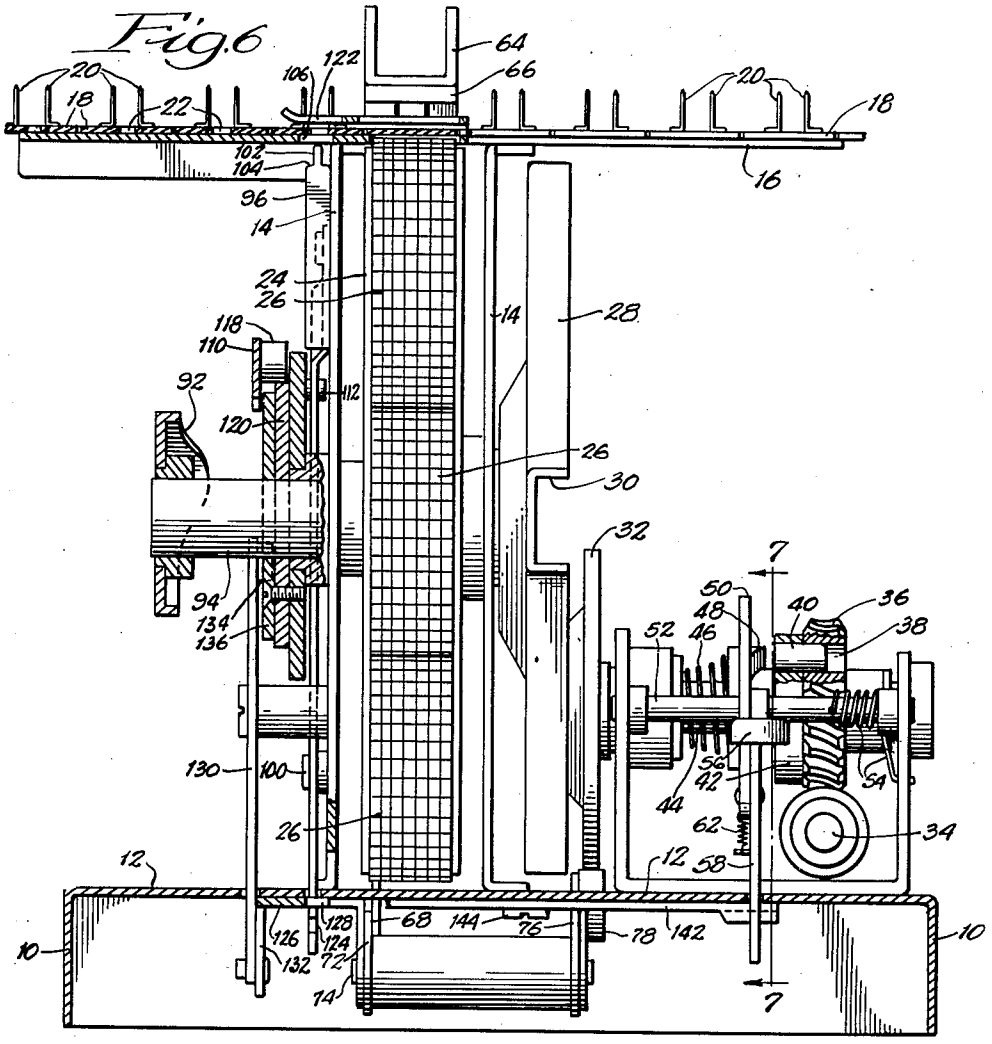
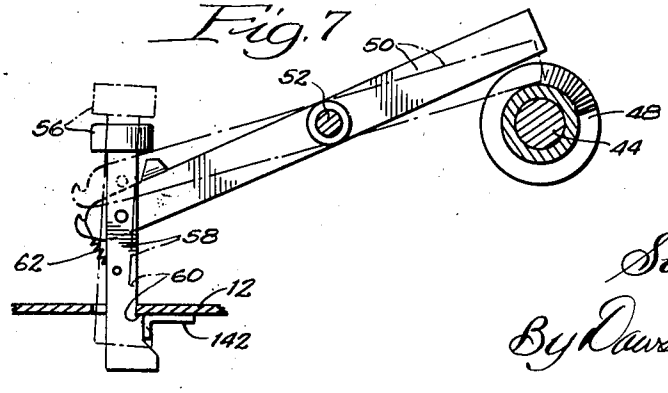


Fig. 7



Inventor:
Sidney Van Tuyl,
By Dawson, Owens & Booth,
Attorneys.

Patented Oct. 5, 1943 2,331,251

UNITED STATES PATENT OFFICE

2,331,251

TAG PRINTING MACHINE

Sidney E. Van Tuyl, Riverside, Ill., assignor to American Tag Company, Chicago, Ill., a corporation of Illinois

Application August 29, 1941, Serial No. 408,772

6 Claims. (Cl. 101—322)

This invention relates to tag printing machines and more particularly to machines for printing a plurality of lines on a tag adapted to be attached to garments.

In prior machines for printing tags the tags have frequently been spoiled because of improper register with the printing mechanism caused by failure of the feeding means to feed the tags properly into the machine. Difficulty has also been caused by operating the machine when there are no tags in it so that the platen is inked and offsets on the back of the tag. When the tag is thereafter fastened to a garment the ink carried by the back thereof is quite apt to be transferred to the garment, thereby damaging the garment.

It is one of the objects of the present invention to provide a tag printing machine in which the above difficulties are overcome and in which proper register of the tags with the printing mechanism is insured.

Another object of the invention is to provide a tag printing machine which will stop when there are no tags therein so that offsetting on the backs of subsequently printed tags is prevented.

Still another object of the invention is to provide a tag printing machine which will be stopped when a tag therein is in an improper position.

The above and other objects and advantages of the invention will be more readily apparent from the following description when read in connection with the accompanying drawings, in which:

Figure 1 is a side view with parts broken away and in section of a machine embodying the invention; Figure 2 is a view similar to Figure 1 of the cam and feeler finger mechanism showing the parts in a different position; Figures 3 and 4 are partial views similar to Figure 2 showing different positions of the feeler finger; Figure 5 is a section on the line 5—5 of Figure 1; Figure 6 is a section at right angles to Figure 1 on the line 6—6 of Figure 5; and Figure 7 is a section on the line 7—7 of Figure 6.

The machine as shown comprises a frame formed by a hollow base 10 having a top closure plate 12 on which a pair of upright side plates 14 are supported in spaced relation. The upright plates 14 support at their upper ends a guide plate 16 adapted to support a strip of tags and having an opening in the central portion of the machine, as shown in Figure 6, through which the tags are exposed to the platen and the printing rolls.

A strip of tags of the type more particularly described and claimed in my co-pending application, Serial No. 408,771, filed August 29, 1941, is adapted to be supported on the plate 16 and the tags may be fed successively into register with the printing means so that the tags will be successively printed. The tags, as best seen in Figure 6, comprise an elongated strip of paper or like material 18 cut at the edge to define separate tags and carrying wire staples 20 by which the tags may be secured to the merchandise. Each tag is formed in its central portion with an elongated substantially rectangular opening 22 adapted to cooperate with feeler mechanism for determining the position of the tags, as will be described hereinafter.

Between the upright plates 14 there is rotatably mounted a printing turret comprising a pair of side plates 24 supporting between them a plurality of type wheels indicated generally at 26. As shown, four type wheels are provided for printing four lines of type, but it will be understood that more or less type wheels could be employed as desired. Each type wheel includes a plurality of rollers rotatably mounted between the plates 24 and separately adjustable to expose any desired combination of type characters in the printing position, as is more particularly described in my co-pending application, Serial No. 391,872, filed May 5, 1941. The type exposed in printing position on the type wheels may be inked as disclosed in said co-pending application, or a ribbon may be provided lying between the type wheels and the tags, as desired.

The turret is adapted to be driven by an intermittent drive mechanism of the Geneva type, shown as including a channeled plate 28 formed with four intercommunicating channels 30 to receive a drive pin carried by a plate 32. The plate 32 is driven by a suitable motor, not shown, which drives a worm 34 which in turn turns a worm wheel 36. The worm wheel 36 is provided with a plurality of openings 38 adapted to receive clutch pins 40 carried by a collar 42 which is slidable on a shaft 44 carrying the plate 32. A spring 46 normally urges the collar 42 into engagement with the worm gear 36 and is adapted to be moved to the left as seen in Figure 6 to disengage the driving pin 40 by means of a face cam 48 rigidly connected to the collar.

The clutch is disegaged by means of a lever 50 pivoted on a shaft 52 and normally rocked toward the face cam by a spring 54. When the lever is released its end drops into the path of the face cam so that as the cam turns it will move to the left and will move the collar 42 to the left to disengage the driving pin 40 from the

worm gear 36. It will be noted that the cam 48 has only a single raised lobe so that the clutch will be disengaged always in the same position at the end of a complete revolution.

The lever 50 for controlling the cam is operated by a finger button 56 carried by a latch bar 58 which is pivoted to the opposite end of the lever 50. The latch bar is formed with a latching shoulder 60 adapted to engage beneath the base plate 12 when it is rocked in a counterclockwise direction, as seen in Figure 7, a spring 62 tending to rock the latch bar in the opposite direction so that it will be released. When the latch bar is depressed the end of lever 50 will be disengaged from the face cam 48, permitting the collar 42 to slide to the right so that the driving pin 40 will engage in the driving hole 38 and the plate 32 will be drivably connected to the worm gear 36. The driving connection will be maintained as long as the button 56 is held in depressed position by the latch mechanism and when the button is released the end of the latch 50 will move into engagement with the face cam so that the clutch will be cammed into disengaged position at the end of a complete revolution.

The tags are adapted to be pressed against the type wheels by means of a platen 64 supported above and in register with the opening in the plate 16. The platen preferably has a facing 66 of the rubber or like adapted to engage the top surface of the tags and to press the lower surface thereof into engagement with the type wheels. The platen is supported by a bar 68 having an elongated slot therein fitting over a bolt or pin 70 carried by the frame members 14. At its lower end the bar 68 is pivotally connected to a lever 72 pivoted at 74 and rigidly connected to a second lever 76 also pivoted at 74. At its free end the lever 76 terminates in a roller 78 engaging the edge of the plate 32 which is formed as a cam to depress the platen each time it is desired to print a line of type on a tag.

The tags are fed through the machine by a feeding mechanism, shown in Figure 1 as including an elongated arm or rod 80 pivoted at 82 and urged in one direction by a coil spring 84. At its upper end the arm 80 pivotally carries a feed finger 86 urged against the tags by a coil spring 88 so that the free end thereof will engage the tags and feed them into register with the platen and type wheels. Intermediate its ends the bar 80 carries a roller 90 engageable with a face cam 92 (Figure 6) carried by an extension of the shaft 94 on which the printing turret is mounted. The cam 92 is formed with a single lobe so that the feeding mechanism will be operated once for each complete revolution of the turret, thereby to feed a new tag into register with the printing means after the completion of each full printing operation.

In order to insure that the tags are in proper register with the printing mechanism and to prevent operation of the machine when it is empty there is provided, according to the present invention, a feeler finger 96 slidably supported on one of the end plates 14 by means of elongated slots 98 fitting over pins 100. At its upper end the feeler finger terminates in a reduced end portion 102 below which is a suitable shoulder 104. The feeler finger registers with an opening 106 in the guide plate 16 and is in a position to register with the opening 22 in a tag which is in position to be fed into the printing means when the tag is properly positioned in the machine.

The feeler finger is normally urged upwardly toward the tags by a coil spring 108 and is urged downwardly by a lever 110 having a pin 112 fitting in an elongated slot 114 in the feeler finger. The lever 110 is rocked in a direction to move the feeler finger downwardly by means of a spring 116 which is stronger than the spring 108 so as to overcome its tension.

The lever 110 carries a roller 118 engaging the edge of a cam 120 supported on the shaft 94 and having a single lobe to rock the lever 110 clockwise upon each revolution of the turret mechanism. When the cam rocks the lever 110 as described the pin 112 moves up away from the bottom of the slot 114, thereby permitting the spring 108 to raise the feeler finger through the opening 106 and into engagement with a tag in the machine.

In the normal operation of the machine the end portion 102 of the feeler finger passes through the opening 22 in the tag and the stop shoulders 104 engage the lower surface of the tag to limit upward movement of the feeler finger. The tag may be held against the plate 16 at this time by a guide plate 122 which has an opening therein to permit passage of the end of the feeler finger. This is the normal operating position when the machine is properly filled with tags and the tags are in the proper feeding position in the machine. If a tag should be fed too far or not far enough, or if it should become twisted on the guide plate so that the opening 22 therein fails to register with the upper end of the feed finger, or if a tag of an improper type having no opening therein should be employed, the upper end of the reduced portion 102 of the feeler would engage the lower surface of the tag as indicated in Figure 3. Thus the feeler finger would not be permitted to move upwardly to its normal position. Another abnormal condition occurs when the machine is empty, the feeler finger continuing to move upwardly at this time until the lower end of the slot 114 engages the pin 112 in its raised position, the feeler finger at this time moving farther upwardly than is normal to the position illustrated in Figure 4.

Under either of the abnormal conditions described above the machine is stopped to prevent improper printing of a tag or printing against the platen when the machine is empty. For this purpose the lower end of the feeler finger 96 is formed with a notch or groove 124. In the normal position, as shown in Figure 2, the notch 124 lies substantially in register with the top of the base plate 12, while in the position of Figure 3 it lies just below the base plate, and in Figure 4 it lies a substantial distance above the base plate.

A slide bar 126 is adapted to cooperate with the notch 124 and is slidably supported on the underside of the base plate 12 by means of a pin and slot connection. Intermediate its ends the slide bar is formed with a projection 128 movable toward and away from the feeler finger 96 by means of a rock arm 130 pivoted intermediate its ends and connected at its lower end by a pin and slot connection to a flange 132 on the slide bar. At its upper end the rock arm 130 carries a roller 134 engaging the edge of a cam plate 136 which is rigid with the cam plate 120. The cam plate 136 is circular throughout the major portion of its periphery and is formed with a single depression as indicated at 130, permitting the rock arm

130 to turn in a clockwise direction, as seen in Figures 1 and 2. When the roller 134 is in register with the depression 138 the rock arm will be moved and the slide bar 126 will slide to the left as seen in Figure 5 under the influence of a coil spring 140 which is connected to a second lever 142 pivoted intermediate its ends at 144 and pivotally connected at one end to the slide bar 126. The opposite end of the lever 142 is adapted to register with the latch bar 58 to rock it in a direction to release the latch shoulder 60 from the plate 12.

In operation, the finger button 53 is depressed and is rocked in a direction to bring the latch shoulder 60 beneath the plate 12 to hold the cam lever 50 in an elevated position out of registry with the face cam 48. At this time the motor is connected to the printing mechanism through the clutch and operates to turn the plate 32 and through the Geneva mechanism intermittently to turn the printing turret and the several cams 92, 120 and 136. If a strip of tags is placed in the machine in proper position they will be successively printed by being brought into contact with the type wheels through operation of the platen 64, it being understood that the type wheels are offset on the turret so as to print the desired lines of type in different positions on the tag. During movement of the turret between the next to the last and the last printing operations on a tag in register with the platen and type wheel, the cam 120 will raise the lever 110, permitting the feeler to move upwardly into engagement with the tag in a position to be fed into register with the printing mechanism. If a proper tag is in the machine and is properly in position, the feeler finger will move to the position shown in Figure 2 with a solid portion thereof below the notch 124 in register with the bar 126. At this time the roller 134 comes into register with the depression 138 of the cam 136 to permit the bar 126 to move to the left, and with the feeler finger in this position, the projection 128 will engage a solid section of the feeler finger, thereby stopping movement of the bar 126 before the lever 142 has rocked far enough to disengage the latch bar 58. This indicates that a proper tag is properly positioned in the machine and the operation will continue as long as this condition prevails.

In the event of an improper tag or improper positioning of a tag in the machine, the reduced end 102 of the feeler will engage the lower surface of the tag and stop the feeler in the position shown in Figure 3. When the slide bar 126 moves to the left, the projection 128 thereon will enter the notch 124, thereby permitting rocking of the lever 142 through a sufficient distance to enable its free end to engage the latch bar 58 and rock it far enough to disengage the latch shoulder 60 from the plate 12. This will enable the lever 50 to move into engagement with the face cam 48 so that when the face cam completes a revolution the clutch will be disengaged as described above to stop operation of the machine before the platen can descend again so as to pick up ink from a type wheel. It will be understood that the cam 48 is so positioned that printing of a tag in register with the type wheel and platen will be completed before the machine is stopped.

In the event that the machine is empty the feeler finger 96 will move to the position shown in Figure 4 in which the lower end thereof is above the bottom of the plate 12 so that when the slide bar 126 moves toward the feeler the projection 128 thereon will pass under the feeler, thereby permitting movement of the lever 142 sufficient to disengage the latch bar 58 as described above. Thus operation of the machine is stopped upon completion of the printing of a tag in register with the printing means in the event that the machine is empty or in the event that an improper tag or an improperly positioned tag is in the machine.

After a strip of tags has been printed by the machine as described above they may be cut from the strip and secured to garments by the fastening machine disclosed and claimed in my copending application, Serial No. 408,773, filed August 29, 1941.

While one embodiment of the present invention has been shown and described in detail, it will be understood that this is illustrative only and is not to be taken as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. A tag printing machine comprising printing means, feed means for feeding tags to be printed to the printing means, means for operating the printing and feed means, a finger slidably supported for movement toward and away from a tag in the machine and having an end shaped to enter an opening in a tag in the machine and a stop shoulder to engage the tag and limit movement of the finger toward it, said finger being stopped in an abnormal position when said end engages a tag or when said stop shoulder fails to engage a tag, a member movable into engagement with the finger when it is in normal position, said finger being shaped to permit said member to move past the position in which it normally engages the finger when the finger is in abnormal position, and means operated by said member when it moves past said last named position to stop operation of the machine.

2. A tag printing machine comprising printing means, a platen, means for periodically moving the platen and printing means together and apart, means for feeding a strip of interconnected tags between the platen and printing means to be impressed thereby, a feeler finger resiliently urged into engagement with a tag in the machine and having a reduced end to enter an opening in the tag and a shoulder to engage and be stopped by the tag, means operated synchronously with the means for moving the platen and printing means together periodically to move the feeler finger away from the tags and releasing during a time when the feeding means is inoperative to allow the finger to move toward the tags, an arm movable toward the feeler and normally stopped by the feeler when said end enters an opening in a tag and said shoulder engages the tag around the opening, the feeler being constructed and arranged to permit additional movement of the arm when the feeler is stopped in an abnormal position by engagement of said end with a tag or by failure of said shoulder to engage a tag, and means operated by such additional movement of the arm to stop operation of the machine.

3. A tag printing machine comprising a plurality of printing units movable successively into register with a tag in printing position in the machine to print a plurality of markings there-

on, a platen movable relatively toward and away from the printing units, feed means successively to feed tags into said printing position, a feeler operated synchronously with said printing units and feed means to engage each tag prior to its being moved into printing position, said feeler having an end shaped to enter an opening in a tag and a stop shoulder to engage the tag around the opening, an arm movable toward the feeler and normally stopped by the feeler when said end enters an opening in a tag and said shoulder engages the tag around the opening, the feeler being constructed and arranged to permit additional movement of the arm when the feeler is stopped in an abnormal position by engagement of said end with a tag or by failure of said shoulder to engage a tag, and means operated by such additional movement of the arm to stop operation of the machine.

4. A tag printing machine comprising printing means, a platen, means for periodically moving the platen and printing means together and apart, means for feeding a strip of interconnected tags between the platen and printing means to be impressed thereby, each of said tags having an opening therein in a predetermined position, a feeler finger movable periodically toward and away from the tags and having a reduced end shaped to enter the opening in a tag and a shoulder portion to engage the lower surface of the tag to stop the feeler finger in a normal position, an arm engaging the feeler finger and stopped thereby in a normal position when the feeler finger is stopped in its normal position, the feeler finger being shaped to permit movement of the arm to an abnormal position when the feeler finger is in an abnormal position, and means operated by movement of the arm to said abnormal position to stop operation of the machine.

5. A tag printing machine comprising a plurality of printing units movable successively into register with a tag in printing position in the machine to print a plurality of markings thereon, a platen movable relatively toward and away from the printing units, feed means successively to feed tags into said printing position, a feeler operated synchronously with said printing units and feed means to engage each tag prior to its being moved into printing position, said feeler having an end shaped to enter an opening in a tag and a stop shoulder to engage the tag around the opening, an arm movable toward the feeler and normally stopped by the feeler when said end enters an opening in a tag and said shoulder engages the tag around the opening, the feeler being constructed and arranged to permit additional movement of the arm when the feeler is stopped in an abnormal position by engagement of said end with a tag or by failure of said shoulder to engage a tag, power means, a clutch connecting the power means to the machine, and means operated by such additional movement of the arm to stop the machine with the platen and printing units separated.

6. A tag printing machine comprising printing means, a platen, means for periodically moving the platen and printing means together and apart, means for feeding a strip of interconnected tags between the platen and printing means to be impressed thereby, each of said tags having an opening therein in a predetermined position, a feeler finger movable periodically toward and away from the tags and having a reduced end shaped to enter the opening in a tag and a shoulder portion to engage the lower surface of the tag to stop the feeler finger in a normal position, an arm engaging the feeler finger and stopped thereby in a normal position when the feeler finger is stopped in its normal position, the feeler finger being shaped to permit movement of the arm to an abnormal position when the feeler finger is in an abnormal position, power means, a clutch connecting the power means to the machine, and means operated by movement of the arm to said abnormal position to stop the machine with the platen and printing units separated.

SIDNEY E. VAN TUYL.