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MACHINE FOR ATTACHING FLAP-SECURING MEANS TO ENVELOPS.


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To all whom it may concern:

Be it known that I, WILLARD E. SWIFT, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Machines for Attaching Flap - Securing Means to Envelops, of which the following, together with the accompanying drawings, is a specification.

My invention relates to machines for attaching flap securing means to envelopes and more particularly to a machine for automatically attaching a button or washer to the body of an envelop in such position that a string or cord carried by the flap of the envelop may be wrapped about it for the purpose of holding the flap securely closed. Automatic machines for this purpose have already been devised, but it often happens that the pull on the button by the cord is sufficient to detach the button from the envelop by tearing the eyulet or fastener which secures the two together from the envelop, this trouble being most frequently experienced in connection with envelopes formed of thin paper, which may be easily torn.

One object of the invention is to provide a machine of the class referred to with automatic means for reinforcing the envelop at the point at which the button is attached, this automatic means acting simultaneously with the button attaching mechanism so that the attaching of the button and the reinforcement by means of a suitable fastener may be completed in a single operation. The buttons, reinforcements and fasteners are all fed automatically into proper position relatively to an envelop placed in the machine so that they may be secured to the envelop during a single cycle of movements of the machine.

Another object of the invention is to provide mechanism for supplying the reinforcements in the form of small tabs of strong paper or the like, these reinforcing tabs being severed automatically by the machine from a tape or strip of suitable material.

While it is primarily intended that the reinforcing tabs shall be used in connection with the envelop flap securing buttons, it will become obvious, as the description of the machine and its advantages proceeds, that in some instances it will be desirable to fasten a tab alone to a sheet of material placed in the machine, the tab serving then as a reinforcement for the eyelet or other fastener. For instance, a shipping tag may be supplied with an eyelet to receive the string or cord for attaching the tag to an article to be tagged. The reinforcing tabs in such instances help to prevent the tag being torn from the attaching cord. When used for this purpose, the supply of buttons to the button feeding mechanism may be discontinued, or the button feeding mechanism may be omitted from the machine altogether.

Another object of the invention is to provide automatic mechanism for simultaneously supplying a button or washer and a reinforcing tab in proper positions, and at the proper time during the cycle of operation of the machine, to be secured to the envelop by the eyelet or other fastener as it is furnished by the fastener setting portion of the machine.

Another object of the invention is to supply an improved form of guard to prevent injury to an operator by the fastener setting mechanism, automatic means being provided to move the guard out of the way as the setting mechanism operates.

Another object of the invention is to provide access to the buttons or washers during their movement through their feeding mechanism for the purpose of releasing them in case they become displaced so as not to feed properly.

Another object of the invention is to provide automatic means to prevent injury to an operator by the button feeding mechanism while the operator is adjusting the positions of the washers which have been displaced so as not to feed properly.

Another object of the invention is to provide an improved form of gravity tube through which the buttons may descend during their movement toward the fastener setting mechanism, the tube being so constructed as to be easily removable from the machine, but also so as to be held securely in position while in use.

Other objects and advantages will appear from the following description taken in con-
connection with the accompanying drawings, in which Figure 1 is a side elevation of a machine constructed in accordance with my invention; Fig. 2 is a plan view of a portion of the machine on the line 2—2 of Fig. 1; Fig. 3 is a side elevation, the lower portion thereof being in section on the line 3—3 of Fig. 2; Fig. 4 is a plan view showing the arrangement of the driving mechanism of the machine; Fig. 5 is a front view of the lower end of the button feeding tube together with adjacent portions of the machine; Fig. 6 is a side view showing the construction which permits access to the buttons in the button tube and also showing the automatic means for protecting an operator from injury while adjusting the positions of the buttons within their tube; Fig. 7 is a view of an envelope after a button and reinforcing tab have been attached thereto by the machine; Fig. 8 is an enlarged sectional view of the attached button and tab on the line 8—8 of Fig. 7; and Fig. 9 is a detail sectional view of the lower end of the upper set.

Like reference characters refer to similar parts in the different figures.

In the form of the invention shown in the drawings, the frame 1 supports the various operative parts of the machine in suitable positions for proper cooperation. A common main driving shaft 2, by which the moving parts of the machine are operated, is driven by a driving wheel 3 through a one-revolution clutch 4 of any desired construction. Inasmuch as this clutch forms no part of the present invention, it is indicated diagrammatically in the drawings and no description thereof is deemed necessary.

The clutch is controlled by a lever 5 operated by a treadle 6 and a spring 7. The form of machine shown is designed to secure the buttons and reinforcing tabs to the envelopes by means of fasteners in the form of eyelets. The eyelet setting mechanism includes a removable lower die or anvil 8 secured by a set screw 9 in the upper face of the forward end of a horizontal supporting extension 10 of the frame 1. An eyelet set 11 in alignment with the die 8 is carried to and from the die by a vertically reciprocating plunger 12 moving in vertical ways 13 formed at the forward end of a horizontal extension 14 of the frame 1. The plunger 12 is supported from a fixed pivot 15 by means of a toggle-joint composed of the links 16 and 17, the toggle-joint being driven by a rod 18 pivotally attached at its forward end to the knee of the toggle-joint and at its rear end to one arm 19 of a bell crank supported by a pivot 20 carried by the frame 1. The other arm 21 of the bell crank is pivotally connected at its free end to the upper end of a driving rod 22, the lower end of the driving rod 22 being actuated by a crank pin 23 on the face of a crank plate 24 secured at the inner free end of the driving shaft 2. It is obvious that, as the driving shaft 2 rotates, the set 11 will be reciprocated toward and from the die 8 by the connecting mechanism described so as to set and properly position an eyelet. The driving rod 22 includes a yieldable joint 25 to prevent injury to the machine in case the full setting motion of the set 11 is prevented by a broken or deformed eyelet, or otherwise. Eyelets are fed automatically to the setting mechanism through an eyelet chute 26 supported by a fixed pivot 27 so that its lower end may move into and out of the path of the set 11 as the set reciprocates. The set 11 is provided with the usual form of spring pressed picker finger 28 as shown in Fig. 9 for picking the lowermost eyelet from the chute 26 as the set descends, the finger being supplied so as to engage the eyelet frictionally and prevent its dropping off after the lower end of the chute has been retracted.

The die 8 and the forward end of its horizontal support 10 are surrounded by the guard 29, this guard serving also as a guide for directing an envelop into proper position between the die and the set to receive an eyelet. Fig. 7 shows an envelop 30 with an eyelet 31 after the eyelet has been set in proper position in the envelop. The guard 29 is pointed at its forward end and its walls diverge rearwardly to surround the die 8 and the forward end of the support 10. An envelop to receive an eyelet is placed with its flap 32 below the guard and with the pointed end of the guard in the opening of the envelop. The envelop is then moved toward the machine until its upper face reaches the proper position under the set. As shown in Fig. 3, the guard 29 extends in its normal position above the die 8 so as to prevent the die 8 from interfering with the motion of the envelop into fastener receiving position.

The guard 29 is provided with a pair of rearwardly extending projections 33 supported at their rear ends upon fixed pivots 34. A lever 35 carried by the pivot 36 has a slot 37 at its forward end which receives a pin 38 projecting from the side of the guard 29 so as to determine the position of the guard about its pivots 34. A pin 39 upon the rear end of the lever 35 enters a slot 40 in the forward end of the lever 41, the lever 41 being supported by a pivot 42. The position of the lever 41 is determined by a connecting rod 43 attached at its upper end to an arm 44 of the main bell crank. When the machine is at rest and the arm 44 of the bell crank is in its normal position as shown in Fig. 1, the connecting rod 43 is raised to bring the upper end of the slot 40 against the pin 39, the guard 29
being thus held in its elevated or normal position. After the machine is started, the connecting rod 43 descends and, when the lower end of the slot 40 reaches the pin 39, the guard 29 is depressed about its supporting pivots 34 so that the envelope may drop onto the anvil or die 8 to receive the eyelet. The guard 29 has an opening 45 between the die 8 and the set 11 so that it may drop without striking the die.

The buttons or washers are fed to the envelopes are dumped into a hopper 46 and are fed from this hopper into a button tube 47 by any suitable agitating mechanism actuated by an arm 48 connected to the arm 19 of the main bell crank by a connecting rod 49. The buttons descend by gravity through the button tube 47 until the lowermost button rests upon the end of a slide 20, the lower end of the tube being separated from the shelf 51 to provide space for this slide. The slide 50 is carried by one arm 52 of a bell crank, the other arm 53 of which is actuated by a connecting rod 54 driven from a cam 55 through a bell crank including the arms 50 and 57, an antifriction roller 58 carried by the arm 57 being held in contact with the periphery of the cam 55 by the spring 59. The shape of the cam 55 is such as to allow the spring 59 to move the slide 50 so as to carry the lowermost button or washer into register with the die 8 and set 11 and to hold the button in such position until it has been entered by the spring finger 28. The cam 55 then retracts the slide 50 from the path of the set 11 so that the set may descend with the washer and with the eyelet which it has previously obtained from the chute 26. While the slide 50 is feeding the lowermost button, the remainder of the stack of buttons within the tube 47 is supported by the upper face of the slide as it moves below the tube and, when the slide has been returned to its normal position, the next button will drop into its seat in the end of the slide and, therefore, into position to be fed upon the next forward motion of the slide.

The lower end of the button tube 47 fits into a vertical opening in the frame of the machine, a flange 60 upon the tube resting against the frame to support the tube in proper position, with its lower position just clearing the upper face of the slide 50. The flange 60 is wide enough to engage a recess or slot 61 in the frame of the machine, except that at one side the flange is reduced or cut away so that, when the tube is rotated horizontally to bring this reduced portion of the flange opposite the recess 61, it will clear the frame to allow the tube to be raised vertically and removed from the machine. The shelf 61 has an opening 62 immediately below the button tube 47 so that, in case the buttons become caught in the tube so as not to descend properly, the operator may reach them with his finger to start them again. This opening 62 is closed by a plate 63 suspended by a pivot 64. The rear end of the plate 63 is extended beyond the pivot 64 and below a second opening 65 in the shelf 51. It is impossible for an operator to reach the buttons within the tube 47 without first lowering the forward end of the plate 63 away from the opening 62. This motion of the plate raises its extended rear end through the opening 65 and into the path of the arm 52 which carries the slide 50. The rear end of the plate 63, therefore, serves as a guard or protector to prevent motion of the slide 50 so as to cause injury to an operator while adjusting the stack of buttons within the tube 47. The plate 63 is held in its normal position by a spring 66.

The reinforcing tabs are fed into the machine in the form of a continuous strip or tape 67, of paper or other suitable material, carried upon a reel 68 pivotally supported at the rear of the machine. After leaving the reel 68, the tape 67 passes through a guide orFr 69 in the frame of the machine and then between a friction feed roll 70 and a presser roll 71. The shaft 72 of the feed roll 70 carries a driven gear wheel 73 which is in mesh with a driving gear wheel 74 rotatable upon the pivot 42. A ratchet 75 secured to one face of the driving gear wheel 74 is actuated by a pawl 76 pivotally attached to the lever 41. As the lever 41 moves, therefore, the feed roll 70 will be rotated to feed the tape 67 toward the die 8. The shaft of the presser roll 71 is journaled in blocks 77 mounted in guide ways 78 formed in the frame of the machine. The blocks 77 are pressed yieldingly toward the feed roll 70 by springs 79, the force of the springs being adjustable by screws 80. The tape 67 is, therefore, held yieldingly against the feed roll 70, the yielding pressure of the presser roll 71 being adjustable at will. The connection between the connecting rod 43 and the arm 41 of the main bell crank is adjustable to and from the pivot 29 of the bell crank so that the angle of movement of the lever 41 and its position at each end of its path may be adjusted to cause the pawl 76 to engage properly with the teeth of the ratchet 75.

After leaving the feed roll 70, the tape passes through a guide tube 81 pivoted at its rear end to the sides of the support 10. The forward end of this guide tube 81 is held in a recess formed between a shelf 82 and a cutter or knife 83 carried by the guard 29, the tube 81 moving about its pivotal support with the guard 29. The tape 67 passes from the tube 81 through an opening between the forward portions of the shelf 82...
and the knife 83, this shelf and knife serving to guide the forward end of the tape into a position just above the die 8 and just below the position of the upper face of an envelop when placed in the machine to receive a fastener. A second cutter or knife 84 is secured to the support 10 immediately behind the die 8 and the cutter 83 is secured adjustably to the guard 29 by screws 85 so that it may be made to register properly with the lower cutter 84.

The relation of the parts of the machine is such that, as the set 11 descends with an eyelet and a button upon its picking finger 28, the guard 29 will drop just sufficiently to allow the lower end of the picking finger 28 to press against the die 8 with the envelop and the forward end of the tape 67 between them. The lower end of the slot 49 will then engage the pin 39 to force the cutter 83 to descend farther past the cutting edge of the cutter 84 so as to sever a tab from the forward end of the tape. The tab is, therefore, not severed until it is held firmly in position by the picking finger 28 and the die 8. The set 11 then continues to descend so as to set the eyelet, thus securing the button 86 and the severed reinforcing tab 87 upon opposite sides of the upper face of the envelop, as shown in Figs. 7 and 8. The support 10 carries a stop or gage 88 to determine the proper position of the envelop upon its supporting guard 29 so that the button 86 and tab 87 may be secured to the envelop in convenient position to receive the free end of the cord 89 carried by the flap 32.

As already suggested, it may be desired at times to set an eyelet in a shipping tag, or other article, and without any button or washer, the reinforcing tab being supplied, however, to reinforce the article at the point where the eyelet is inserted. When the machine is used for this purpose, no buttons are supplied to the hopper 46, the hopper and the button tube 47 being left empty, or the button tube 47 may be removed from the machine if desired. The operation of the machine is otherwise unchanged.

While I have shown and described the details of one form of my invention, I do not wish to be limited to such details as changes may be made without departing from the spirit of the invention; but having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a fastener setting machine, fastener setting mechanism, means for feeding a button into fastener receiving position, means for feeding a reinforcing member into fastener receiving position, means for actuating the setting mechanism to secure the button and the reinforcing member to an envelop by a fastener.

2. In a fastener setting machine, fastener setting mechanism, means for feeding a button into fastener receiving position, means for feeding a reinforcing member into fastener receiving position, means for feeding a fastener to the fastener setting mechanism, and means for actuating the fastener setting mechanism to secure the button and reinforcing member to an envelop by the fastener.

3. In a fastener setting machine, fastener setting mechanism, means for feeding a button into fastener receiving position, means for feeding a tape toward the fastener setting mechanism, means for severing a reinforcing tab from the tape, and means for actuating the fastener setting mechanism to secure the button and reinforcing tab to an envelop by a fastener.

4. In a fastener setting machine, an anvil, a reciprocatory set, means for feeding a button into the path of the set, means for feeding a reinforcing member into the path of the set, and means for moving the set toward the anvil to secure the button and the reinforcing member to an envelop by a fastener.

5. In a fastener setting machine, an anvil, a reciprocatory set, means for feeding a fastener into the path of the set, means for feeding a reinforcing member into the path of the set, and means for moving the set toward the anvil to secure the button and the reinforcing member to an envelop by a fastener.

6. In a fastener setting machine, a support for one face of an envelop, an anvil adjacent said support, a reciprocatory set, means for feeding a button into the path of the set on one side of said face of the envelop, means for feeding a reinforcing member into the path of the set on the other side of said face of the envelop, and means for moving the set toward the anvil to secure the button and the reinforcing member to opposite sides of said face of the envelop by a fastener.

7. In a fastener setting machine, a support for one face of an envelop, an anvil adjacent said support, a reciprocatory set, means for feeding a fastener and a button into the path of the set on one side of said face of the envelop, means for feeding a reinforcing member into the path of the set on the other side of said face of the envelop, and means to move the set toward the anvil to secure the button and the reinforcing member to the envelop by the fastener.

8. In a fastener setting machine, a support for an envelop, means for feeding a button to a point outside an envelop on the support, means for feeding a reinforcing member to a point within an envelop on the support, and means for securing the button and reinforcing member to opposite sides of one face of the envelop by a fastener.
9. In a fastener setting machine, a support for an envelop, an envelop adjacent said support, a set, means for feeding a button toward an envelop on the support, means for feeding one end of a tape toward the envelop, means for holding the end of the tape against the envelop, means for thereupon after severing the tape to form a reinforcing tab, and means for causing the set to approach the anvil to secure the button and tab to the envelop by a fastener.

10. In a fastener setting machine, fastener setting mechanism, means for feeding a tape toward the setting mechanism, means for severing the tape to form a tab, and means for actuating the setting mechanism to secure the tab to an article by a fastener.

11. In a fastener setting machine, fastener setting mechanism, a feed roll for feeding a tape toward the fastener setting mechanism, a presser roll for holding the tape against the feed roll, means for severing the tape to form a tab, and means for actuating the fastener setting mechanism to secure the tab to an article by a fastener.

12. In a fastener setting machine, fastener setting mechanism, a feed roll for feeding a tape toward the fastener setting mechanism, a presser roll, yielding means for pressing the presser roll toward the feed roll, means for severing the tape to form a tab, and means for actuating the fastener setting mechanism to secure the tab to an article by a fastener.

13. In a fastener setting machine, fastener setting mechanism, means for feeding a tape toward the fastener setting mechanism, means for guiding the tape from the tape feeding means to the fastener setting mechanism, means for severing the tape to form a tab, and means for actuating the fastener setting mechanism to secure the tab to an article by a fastener.

14. In a fastener setting machine, an anvil, a set, a guard surrounding the anvil, a tape guide pivotally supported at one end and supported by the guard at its other end, means for feeding a tape to the pivoted end of the guide, means for severing the tape to form a tab after it leaves the other end of the guide, means for moving the guard from around the anvil, and means for actuating the set to secure the tab to an article.

15. In a fastener setting machine, a set, a fixed anvil, a fixed cutter, a guard surrounding the anvil, a cutter carried by the guard, means for feeding a tape between the cutters and toward the anvil, means for moving the guard and the cutter supported thereby to sever the tape to form a tab, and means for moving the set toward the anvil to secure the tab to an article.

16. In a fastener setting machine, an anvil, a set provided with a spring pressed finger, means for feeding a tape between the set and anvil, means for moving the set toward the anvil to cause the end of the tape to be clamped between the spring pressed finger and the anvil and then to cause the set to secure the end of the tape to an article, and means for severing the end of the tape after it has been clamped but before it has been secured to the article.

17. In a fastener setting machine, fastener setting mechanism, means for feeding a tape toward the fastener setting mechanism, means for severing the tape to form a tab, a lever for actuating both the feeding means and the severing means, and means for actuating the fastener setting mechanism to secure the tab to an article.

18. In a fastener setting machine, fastener setting mechanism including an anvil, a guard surrounding the anvil, means for feeding a tape toward the fastener setting mechanism, means for severing the tape to form a tab, a lever for moving the guard from around the anvil and for actuating the tape feeding means, and means for actuating the fastener setting mechanism to secure the tab to an article.

19. In a fastener setting machine, fastener setting mechanism, means for feeding a tape toward the fastener setting mechanism, means for severing the tape to form a tab, a lever for actuating the tape feeding means and the tape severing means, and means for actuating the fastener setting mechanism to secure the tab to an article.

20. In a fastener setting machine, fastener setting mechanism, means for feeding a tape toward the fastener setting mechanism, means for severing the tape to form a tab, a lever for actuating the tape feeding means and the tape severing means, there being a lost motion connection between the lever and the tape severing means, and means for actuating the fastener setting mechanism to secure the tab to an article.

21. A frame supporting a plunger with means for operating it, means for supplying eyelets in a position in the path of movement of said plunger, a magazine containing a quantity of disks, means for carrying the disks from said magazine to a position beneath said eyelet position to receive said eyelets that are passed through said disks by said plunger, and means to support an article beneath said disk position while being acted upon by said plunger to affix a disk to said article by means of an eyelet.

22. A frame supporting a plunger with means for operating it, means for supplying eyelets in a position in the path of movement of said plunger, a magazine for disks, a carrier to move the disks to a position underneath said plunger, means for withdrawing the carrier after the plunger has passed through a disk, and means to support an article beneath said disk position while being acted upon by said plunger to affix a disk to said article by means of an eyelet.
ing acted upon by said plunger to affix a disk to said article by means of an eyelet.

23. A frame supporting a plunger with means for operating it, means for supplying eyelets in a position in the path of movement of said plunger, a magazine containing a quantity of disks, means for carrying the disks from said magazine to a position in the path of movement of said eyelets that are passed through said disk by said plunger, and means to support an article beneath said disk position while being acted upon by said plunger to affix a disk to said article by means of an eyelet.

24. A frame supporting a plunger with means for operating it and having means to support an article, means for supplying eyelets in a position to be affixed to said article by said plunger, a disk magazine, a carrier mounted for reciprocating movement from the magazine to the plunger to supply disks to the latter beneath said eyelet position, said carrier resting normally underneath the plunger, and means for moving the carrier to a position underneath the magazine in the downward movement of the plunger.

25. A frame supporting a plunger with means for operating it, means for supplying eyelets in a position in the path of movement of said plunger, a magazine containing a quantity of disks, a carrier to convey the disks from said magazine to a position to receive said eyelets that are passed through said disks by said plunger, said carrier being arranged to support said disks as said eyelets are passed through them, and means to support an article beneath said disk position while being acted upon by said plunger to affix a disk to said article by means of an eyelet.

26. A frame supporting a plunger with means for operating it, means for supplying eyelets in a position in the path of movement of said plunger, a magazine containing a quantity of disks, a carrier to convey the disks from said magazine to a position to receive said eyelets that are passed through said disks by said plunger, said carrier acting as a support for the disks as the eyelets are passed through them, means for removing the carrier from underneath the plunger after the eyelets have been forced through the disks, and means to support an article beneath said disk position while being acted upon by said plunger to affix a disk to said article by means of an eyelet.

27. A machine of the class described having, in combination, cooperating setting dies, a holder for washers in strip form, means for feeding the strip to position the endmost washer in alignment with the dies, and means for severing said washer from the strip after it has been so positioned.

28. A machine of the class described having, in combination, cooperating setting dies, means for feeding a strip of washers to position the endmost washer in alignment with the dies, and means for severing said washer from the strip after it has been so positioned.

Dated this seventh day of July, 1913.

WILLARD E. SWIFT.

Witnesses:
Penelope Comberbach,
Rufus B. Fowler.