March 26, 1957 J. P. TRECIOKAS 2,786,203

APPARATUS FOR SETTING SNAP FASTENERS UPON ENVELOPES

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Fig. 1

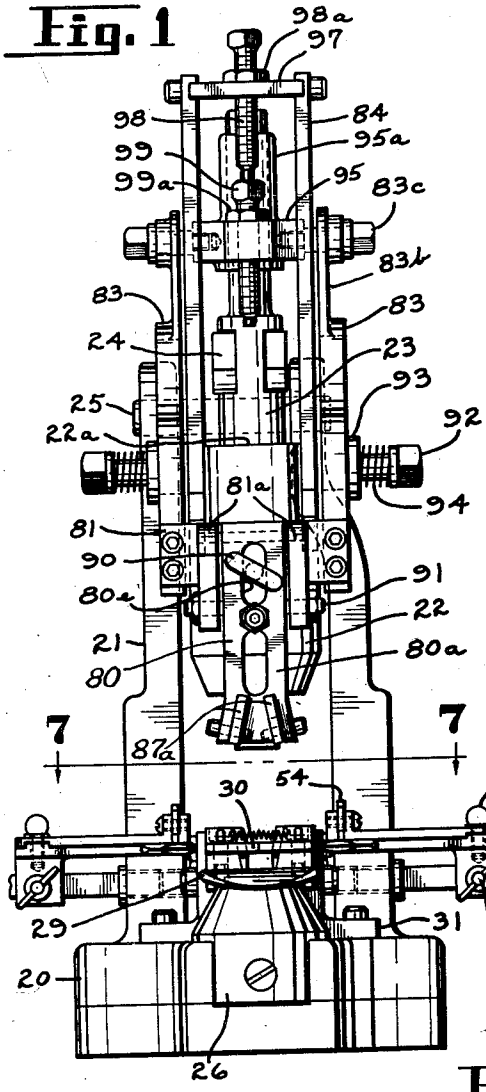


Fig. 2

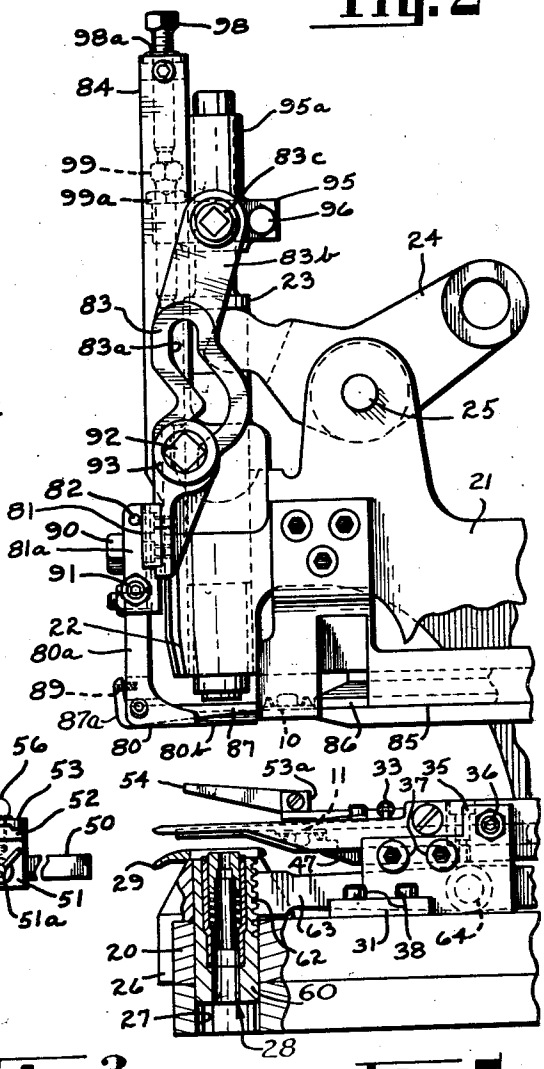


Fig. 3

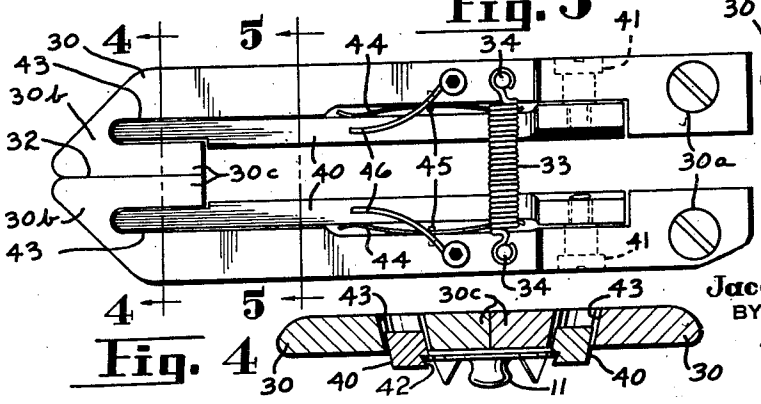


Fig. 5

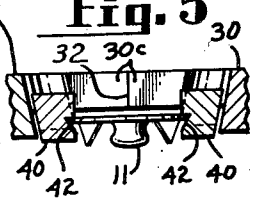


Fig. 4

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Fig. 7

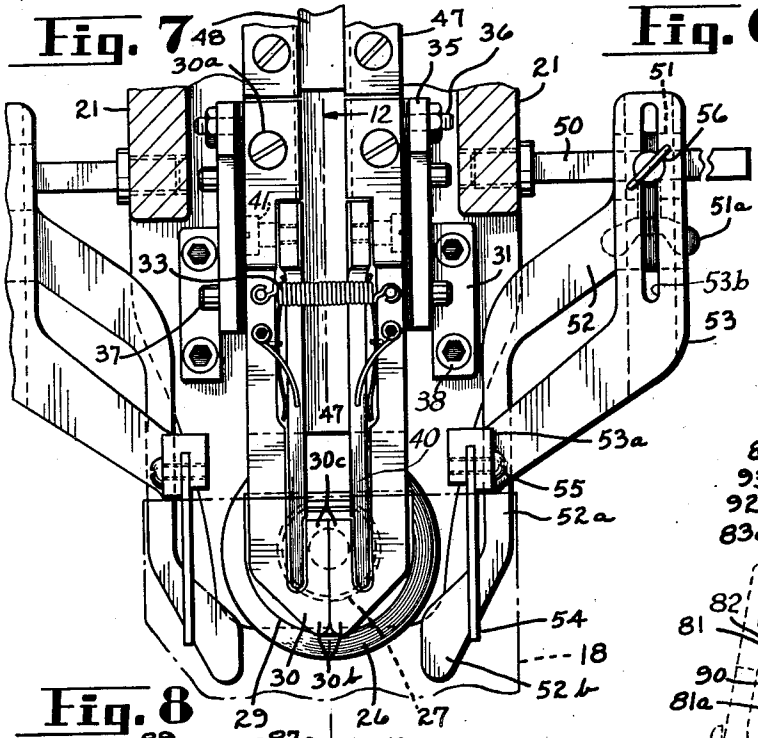


Fig. 6

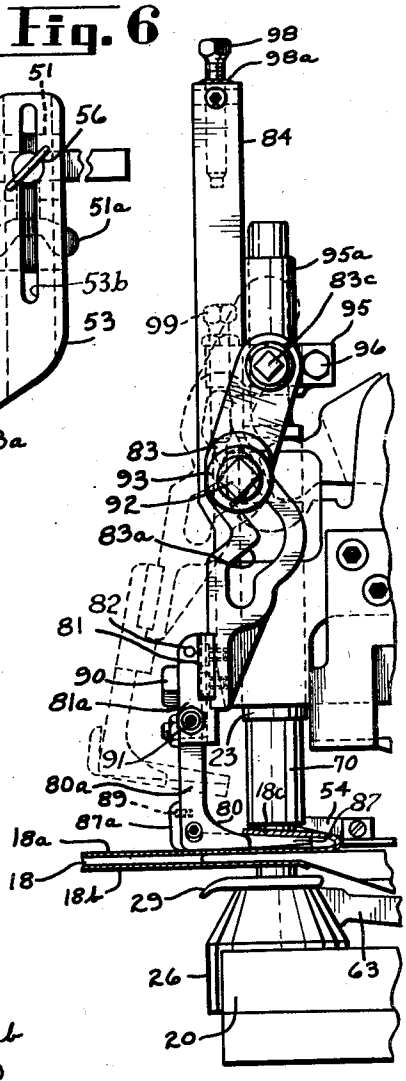


Fig. 8

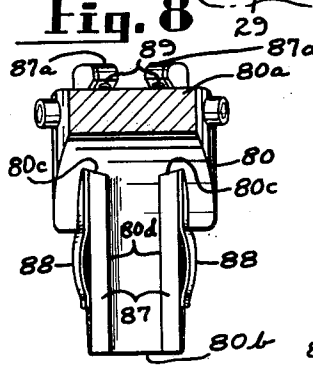


Fig. 9

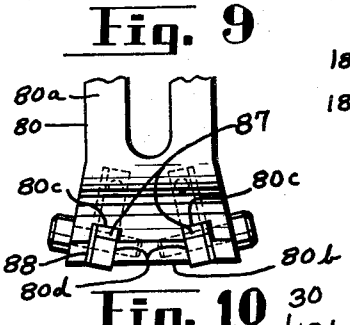


Fig. 11

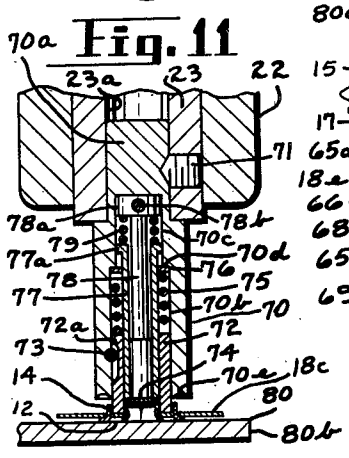


Fig. 10

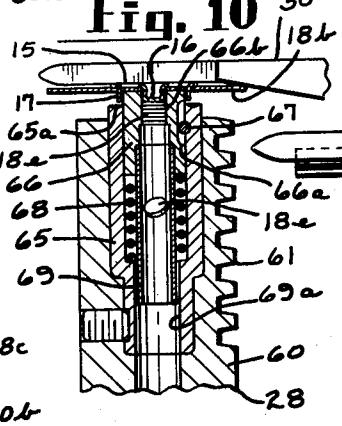
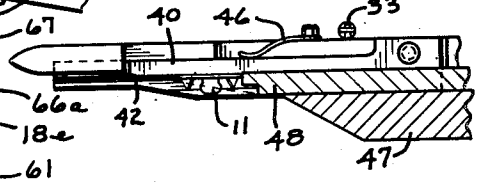


Fig. 12



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Fig. 13

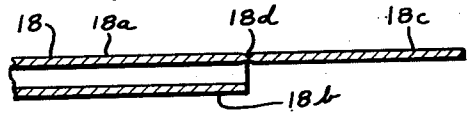


Fig. 14

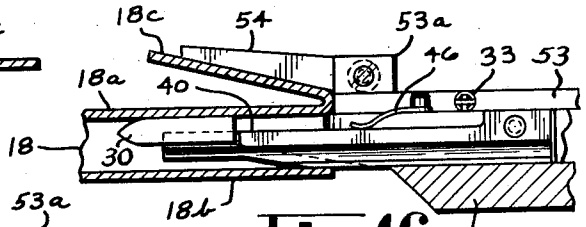


Fig. 15

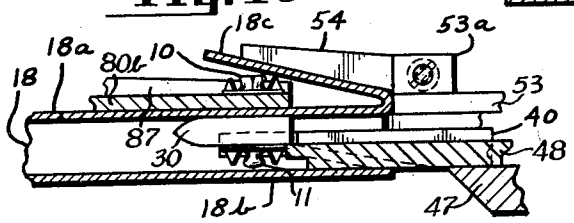


Fig. 16

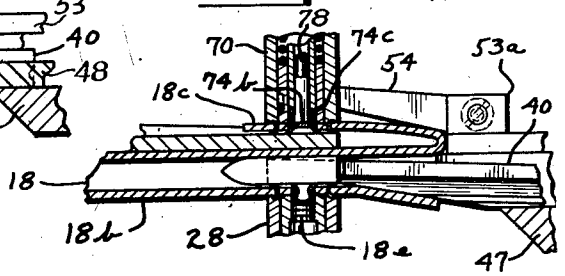


Fig. 17

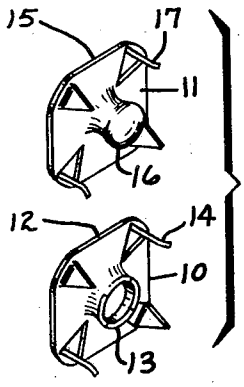


Fig. 20

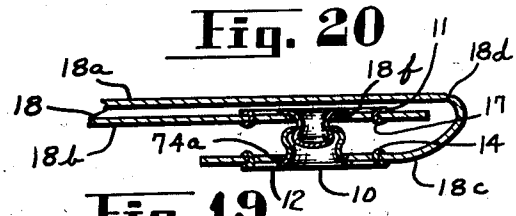


Fig. 19

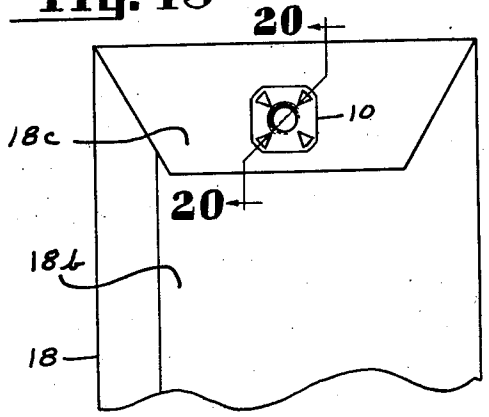
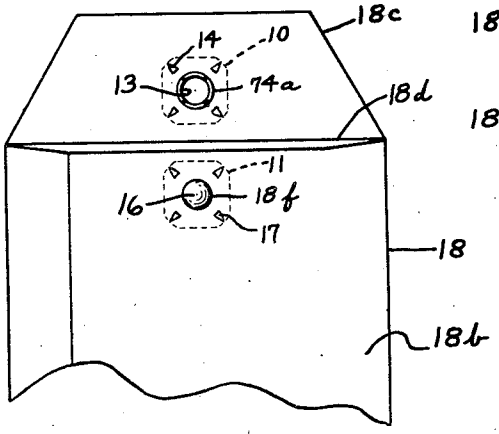


Fig. 18



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United States Patent Office

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Patented Mar. 26, 1957

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APPARATUS FOR SETTING SNAP FASTENERS UPON ENVELOPES

Jacob P. Treciokas, Oakville, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn., a specially chartered corporation of Connecticut

Application November 25, 1953, Serial No. 394,392

11 Claims. (Cl. 1—120)

This invention relates to apparatus for attaching complemental snap fastener elements to envelopes of the type adapted for repeated use.

Heretofore when snap fasteners were attached to envelopes the socket and stud elements were customarily set on their respective parts of the envelope separately and by different machines, or if set simultaneously the flap to which one of the elements was attached was in an extended position so that when the flap was folded against the back for closing the envelope it was very difficult to assure that the complemental fastener elements would line up with each other.

In the disclosed apparatus the complemental snap fastener elements are set simultaneously upon their respective parts of the envelope in aligned position so that when the flap is folded over to close the envelope the complemental fastener elements will always properly align with each other.

This apparatus involves the use of complemental stud and socket elements which are formed with prongs projecting out of their base by means of which the elements are attached to their respective parts of the envelope.

The particular stud and socket elements adapted for use on an envelope for repeated use are designed with integral prongs that project from the base of the elements in the same direction as the fastener-engaging parts of said elements. By the use of this type of snap fastener construction the elements can be attached directly to an envelope without the use of rivets, posts or similar attaching devices.

The envelopes to which the fasteners are to be attached are furnished with their flaps in an extended position and the mode of operation of the apparatus involves the operation of first folding the flap back toward the front of the envelope and then inserting the envelope into a jig for holding the envelope in a definite position relative to the setting station of an attaching machine, said jig having means to hold the flap in an inclined or spaced position relative to the envelope front and also holding the pocket of the envelope in an open position. Next, the fastener elements are positioned relative to the envelope so that one of the elements will be disposed between the flap and the envelope front with its fastener-engaging part directed toward the flap, and the other element will be disposed within the envelope pocket with its fastener-engaging part directed toward the envelope back and both elements in aligned position with each other after which they may be clinched to their respective parts of the envelope.

Another object of this invention is to pierce out an opening in the envelope flap and back by means of the conjoint action of the fastener elements and setting tools coincident with the setting operation, thus eliminating the need of pre-piercing the envelope to accommodate the fastener-engaging parts of the stud and socket elements.

Other objects and advantages of the invention will be pointed out in the detailed description thereof which follows or will be apparent from such description.

In the drawings:

Fig. 1 is a front elevational view of a fastener setting machine embodying the invention and showing the machine in its normal inactive position.

Fig. 2 is a side elevational view of the same.

Fig. 3 is a plan view of the lower anvil plates and associated jaw elements of the machine.

Fig. 4 is a transverse sectional view through the anvil part of the lower anvil plates taken along the line 4—4 of Fig. 3.

Fig. 5 is a similar sectional view taken along the line 5—5 of Fig. 3.

Fig. 6 is a side elevational view similar to Fig. 2 but showing the setting tools as they appear at the end of the setting stroke.

Fig. 7 is a horizontal sectional view of the machine taken along the line 7—7 of Fig. 1 looking downwardly.

Fig. 8 is a plan and sectional view of the upper anvil and jaw unit.

Fig. 9 is a back view of the same.

Fig. 10 is a vertical sectional view through the lower setting punch and anvil showing the stud and prongs pierced through the envelope stock ready for clinching.

Fig. 11 is a similar view through the upper setting punch and anvil showing the socket and prongs pierced through the envelope flap ready for clinching.

Fig. 12 is a longitudinal sectional view through the lower anvil unit and pusher taken along the line 12—12 of Fig. 7.

Figs. 13 to 16 inclusive, show the method steps involved in applying the fastener elements to the envelope.

Fig. 17 is a perspective view of the two fastener elements which are applied to the flap and back of the envelope.

Fig. 18 is a plan view of the open end of the envelope in open position showing the fastener elements attached thereto.

Fig. 19 is a similar view showing the envelope in closed position, and

Fig. 20 is a cross-sectional view of the fastener elements as applied to the envelope taken along line 20—20 of Fig. 19.

The particular type of snap fastener element that this invention is adapted to set upon a clasp type or reusable envelope is best shown in Fig. 17 and consists of a socket element 10 and a stud element 11. The socket 10 has a flat base 12 preferably of square shape having an annular series of spring fingers 13 formed upwardly out of the center of the base and also attaching prongs 14 sheared out of the base and bent upwardly in the same direction as the spring fingers 13. The stud 11 likewise is provided with a square base 15 having a central stud head 16 and attaching prongs 17 projecting upwardly from the base in the same direction as the stud head.

A conventional reusable envelope 18 is shown in Figs. 18 and 19 having a front section 18*a*, a back section 18*b*, and a flap 18*c*, that is foldable along a fold line 18*d*.

As shown in Fig. 20 the socket 10 and stud 11 are attached respectively to the envelope flap 18*c* and back section 18*b*. Specifically the socket 10 is attached to flap 18*c* with the base 12 disposed on the outside of the flap and the fingers 13 projecting through a hole 74*a* in the flap that is self-pierced therethrough by the fingers 13 coincident with the setting operation. At the same time the prongs 14 are pierced through the flap stock and bent over against the flap 18*c* from the underside thereof. The stud 11 is attached to the envelope back 18*b* with its base 15 disposed against the inside of said envelope back with its stud head 16 projecting through an opening 18*f* also self-pierced by said head and held in position by having the prongs 17 pierced therethrough and clinched against the outside of said envelope back.

One form of machine for assembling the socket and stud elements to a reusable envelope in the manner as above described is disclosed in Figs. 1 to 12 inclusive. This invention is embodied in a power-driven fastener setting machine consisting essentially of a base 20, a standard or upright frame 21, supporting a head 22 in which is reciprocally mounted an upper setting plunger 23 operated by a bell crank lever 24 pivoted on the standard 21 as at 25. The bell crank lever 24 may be operated from the power shaft of the machine in the usual manner.

Attached to the front end of the base 20 is a bearing block 26 and through the block 26 and base 20 is a common hole 27 within which is slidably fitted the lower die unit or setting tool 28. Attached to the upper surface of the bearing block 26 is a guide plate 29 that facilitates the feeding of the envelope into the machine.

Lower anvil and jaw unit

The lower anvil member for upsetting the prongs of one of the fastener elements in attaching the same to the envelope back is best seen in Figs. 3, 4, 5, 7 and 12 and in this particular machine the lower anvil serves to set the stud element 11. This anvil member hereinafter referred to as the stationary anvil consists of a bifurcated plate 30, each part of which has its inner end secured on the terminal end of a feed track 47 by screws 30*a*, and the feed track 47 in turn is mounted between a pair of support brackets 31 and secured thereto as by screws 37. The brackets 31 are mounted on base 20 as by screws 38. The anvil plates 30 are mounted so that they can pivot in a horizontal plane about the screws 30*a* and extend forwardly to overlie the lower die unit 28 and terminate in converging extensions 30*b* which in turn support rearward extensions 30*c* in side-by-side relationship. The extensions 30*c* are in fact the anvil proper of the anvil plates 30 against the underside of which the stud base 15 is supported during the setting operation. The anvil portions 30*c* of the plates 30 are separated by a dividing line 32 so as to permit the forward ends of said anvil plate to separate slightly for reasons as will be described later. The anvil portions 30*c* are normally held in closed position along the dividing line 32 by a tension coil spring 33 secured to the upper surface of the plates 30 by stud pins 34. In order to assure that the anvil portions 30*c* of the plates 30 cannot swing inwardly beyond the division line 32 each support bracket 31 is provided with a pair of upwardly extending lugs 35 in which adjusting screws 36 are threaded and engage the outer sides of the plates 30 slightly to the rear of the pivot screws 30*a*. By this arrangement the screws 36 can be adjusted to limit the inward swing of the anvil portions 30*c* of said anvil plates 30.

A pair of elongated guide fingers or jaws 40 are pivotally attached to the inside edges of the anvil plates 30 as by screws 41 and said screws are mounted so that said fingers can swing in a slight diverging relationship of substantially 12° from the vertical for reasons as will appear later that is, the axes of said screws incline slightly upwardly from the horizontal toward the vertical central plane of the machine. The inside adjacent edges of the fingers are provided with tapered grooves 42 through which the edges of the stud elements 11 are guided on their way to the setting station.

In order to provide a slight binding action upon the fastener elements as they are fed to the setting station through the finger grooves 42, the fingers 40 are mounted to have a small amount of lateral play by the relatively loose manner in which the finger-attaching screws 41 are mounted within their respective sockets in the plates 30. The front ends of the fingers 40 are loosely confined within slots 43 in the plates 30 that limit the lateral movement of said fingers. It will be noted from Figs. 4 and 5 that the bearing surfaces of the plates 30, the slots 43 and the fingers 40 are biased upwardly in an outward direction to conform to the diverging swinging motion of the fingers for the purpose of spreading the fingers outwardly to release the fastener element from the finger ends when the latter are swung upwardly during the fastener setting operation. The forward ends of the fingers 40 are normally biased inwardly by leaf springs 44 disposed between the adjacent surfaces of the plates 30 and jaws 40, the springs being held in place by pins 45 mounted in said plates 30. In swinging the ends of the fingers upwardly to release the fastener elements they are pivoted against the influence of spring fingers 46 secured to the top of the plates 30 and tensioned against the upper surfaces of the fingers 40. The feed fingers as seen in Fig. 7 are lined up with a feed track 47 supported on brackets 31 and through which the fastener elements can be fed to the fingers into the setting station by a pusher slide 48.

Envelope jig fixture

The mechanism for holding the envelope in centralized position relative to the setting station and also to hold the envelope flap bent backwardly toward the envelope front during the fastener setting operation is best seen in Figs. 1 and 7 and consists of a pair of support rods 50 preferably square in cross section extending horizontally outwardly from the opposite sides of the frame 21. Slidably mounted on the rods 50 are brackets 51 held in adjusted position by thumb screws 51*a*. Formed as an integral part of the brackets 51 are forwardly extending support arms 52 having straight sections 52*a* terminating in converging sections 52*b* that are disposed slightly forwardly of the anvil plates 30. The brackets 51 are adapted to be adjusted laterally along the rods 50 so that the straight arm sections 52*a* may be positioned to substantially the width of the envelope pocket to permit the envelope to be slipped over said sections 52*a* (shown in dot-and-dash outline in Fig. 7) and centralize the envelope relatively to the setting station of the machine. It should be understood that the brackets 51 can also be adjusted laterally so as to accommodate different sizes of envelopes.

A pair of flap-positioning arms 53 are adjustably mounted upon the brackets 51 above the arms 52 and extend forwardly and terminate in upwardly extending lugs 53*a* to which are secured adjustable fingers 54 as by screws 55. The fingers 54 may be pivotally adjusted about the screws 55 to the desired position that the envelope flap should be set when the envelope is inserted into the machine. The arms 53 are secured to the upper surfaces of the brackets 51 by a thumb screw 56 threaded into brackets 51, and the arms 53 are provided with elongated slots 53*b* so that said arms 53 and the fingers 54 may be adjusted parallel to the horizontal axis of the machine and at the desired distance rearwardly or forwardly of the setting station of the machine.

Lower setting tool unit

The lower setting tool unit 28 (see Figs. 2 and 10) consists of a cup-shaped plunger housing 60 operating within the hole 27. A gear rack 61 is formed on the outer surface of the housing 60 and engaged by a sector gear 62 on the end of lever 63 pivoted at 64 in brackets 31. The lever 63 may be operated by a suitable cam on the main drive shaft of the machine. A setting die 65 is rigidly secured within the housing 60 and a spring cushioned sleeve 66 is slidably fitted within said die 65. The upper face of the die 65 is formed with an annular groove 65*a* for bending and clinching the prongs 17 of the stud 11 and is normally disposed a slight distance below the upper end of the cushioned sleeve 66. The travel of the sleeve 66, within the die 65, is controlled by an elongated recess 66*a* in the exterior wall of said sleeve and within which recess a cross pin 67 is engaged, the latter being driven into a suitable opening in die 65. The sleeve 66 operates against the influence of a coiled spring 68 confined within the hollow of said die 65.

The upper end of the sleeve **66** is provided with an opening **66***b* of a size to snugly fit about the head of the stud element **11** and serves with said stud head **16** to shear out a round blank **18***e* and provide a hole **18***f* in the envelope back **18***b* to accommodate the stud head when the latter is forced against the envelope stock coincident with the setting operation. The blank **18***e* sheared out of the envelope stock may be ejected through a tube **69** attached to the interior of the sleeve **66** and extending through a clearance opening **69***a* in the lower end of the setting die **65** and plunger housing **60**.

Upper setting tool unit

The upper setting tool unit (Fig. 11) consists of a setting die **70** having an upper reduced shank **70***a* which is fitted into a socket **23***a* in the plunger **23** and held in place by a set screw **71**. The die **70** is formed with a lower bore **70***b* and an upper bore **70***c* of reduced diameter that provides a shoulder **70***d* therebetween. The lower end of the die **70** is formed with an annular recess **70***e* that serves to bend and clinch the prongs **14** of the socket element **10** against the envelope flap during the setting operation. Within the lower larger bore **70***b* is slidably fitted a plunger sleeve **72** having its outer end normally extended a slight distance beyond the lower end of the die **70**. The normal position of sleeve **72** within the die bore **70***b* is determined by a slot **72***a* in the side wall thereof and cross pin **73** secured in die **70** and traversing said slot **72***a*. The plunger sleeve **72** serves to press the envelope stock downwardly upon the socket **10** and force the prongs **14** thereof through the envelope material and at the same time cooperate with the socket fingers **13** to pierce out a blank **74** in the envelope stock and provide an opening **74***a* therein through which the socket fingers may project. The sleeve **72** is moved inwardly against the the influence of a relatively strong coil spring **75** having its inner end seated against a washer **76** which in turn is seated against the shoulder **70***d* at the inner end of the larger bore **70***b*. An ejector sleeve **77** is slidably fitted within the plunger sleeve **72** and has an enlarged head **77***a* at its inner end, which is normally seated against the upper surface of the washer **76**, the latter extending inwardly of the smaller die bore **70***c*. Inwardly of the ejector sleeve **77** is a socket sizing tool **78** that travels with the die **70** and is provided with an enlarged head **78**[a] seated against the base of the smaller die bore **70***c* and held in place by a cross pin **78***b* fixed to said die **70**. A relatively light coil spring **79** is compressed between the sizing tool head **78**[a] and the ejector sleeve head **77***a* to normally hold said sleeve in its projected state. The details of the operation of this upper die unit will be given later in describing the machine operations.

Upper movable anvil and jaws for socket

The mechanism for picking up the socket element **10** from the feed track and conveying it underneath the envelope flap at the setting station of the machine is best seen in Figs. 1, 2, 6, 8 and 9. This mechanism consists of an L-shaped anvil member **80** having its upright leg **80***a* pivotally mounted between a pair of projecting lugs **81***a* formed as an integral part of support bracket **81** as by a pin **82**. The bracket **81** in turn is secured to the lower ends of a pair of cam plates **83** slidably mounted on the outer surface of a pair of extension bars **84** which in turn are secured to the opposite sides of the machine head **22**. The lower horizontal leg **80***b* is the upper anvil plate for setting the socket to the envelope flap and normally extends underneath the upper setting plunger **23** in line with a socket feed track **85** through which the socket elements **10** may be fed singly by a pusher slide **86**.

In order to hold the socket **10** upon the anvil plate **80***b* while conveying the socket from the feed track to the setting station, a pair of jaws **87** are pivotally connected in slots **80***c* provided in the anvil member **80**. As noted in Fig. 9 the slots **80***c* are slanted downwardly and outwardly relative to the vertical axis of the anvil member so as to cause the jaws **87** to swing downwardly and outwardly for the purpose of releasing the socket element **10** during the setting operation. The jaws **87** are so mounted in the slots **80***c* as to permit some amount of lateral play to accommodate the tolerances allowed in the construction of the socket and are normally urged inwardly against the inclined opposite walls **80***d* of the anvil plate **80***b* by leaf springs **88** (see Fig. 8). In order to hold the socket gripping ends of the jaws **87** upwardly relative to the anvil plate **80***b* the outer ends of said jaws are formed with upwardly extending fingers **87***a* that are normally urged outwardly by coil springs **89** seated in suitable recesses in the adjacent face of the anvil member **80**.

The anvil member **80** is mounted on pin **82** so as to pivot outwardly relative to the bracket **81** and is normally held against the outer face of said bracket **81** by a thumb screw **90**. From Fig. 1 it will be noted that the thumb screw **90** is normally positioned crosswise of a slot **80***e* provided in the upper leg of the anvil member **80**. By turning the screw **90** so that its head aligns with slot **80***e* the anvil member may be hinged outwardly about the pin **82** in order to provide better access to the setting station of the machine.

In order to laterally adjust the anvil member **80** so that the anvil plate **80***b* can be properly adjusted to line up with the feed track **85**, a pair of opposite set screws **91** are threaded in the bracket lugs **81***a* and are adapted to engage the opposite edges of said anvil member **80**.

As pointed out previously the anvil member **80** and associated jaws **87** are adapted to pick up the socket **10** from the feed track **85** and convey it to the setting station underneath the envelope flap. This control of the anvil member is derived from the cam plates **83**. As shown in Figs. 2 and 6 the cam plates are formed with the slots **83***a* that cooperate with guide bolts **92** mounted on the extension bars **84**. To hold the cam plates **83** against the sides of the extension bars **84** and also to provide some amount of friction to the cam plates a fibre washer **93** surrounds each bolt **92** and is compressed against said plates by compression springs **94**.

The cam plates **83** are operated by a slip connection with the upper plunger **23**. This slip connection is obtained by a split block **95** and integral sleeve **95***a* frictionally embracing the plunger **23**. The cam plates **83** are provided with extensions **83***b* having trunnion connections **83***c* with the split block **95**. The frictional grip between the split block **95** and sleeve **95***a* with the plunger **23** may be controlled by an adjusting screw **96** transversely threaded in the split portion of said block.

In order to control the amount of travel of the upper anvil member **80** and associated mechanism a cross bar **97** is rigidly secured to the upper ends of the extension bars **84**. An adjustable set screw **98** is threaded in the cross bar **97** preferably in a plane common with the vertical axis of the setting station and may be held in adjusted position by a lock nut **98***a*. The set screw **98** is adapted to be abutted by the head of another set screw **99** adjustably mounted in the split block **95** and held in adjusted position by lock nut **99***a* and serves to limit the upward travel of the anvil member **80**. The second set screw **99** is adapted to contact the upper face of the machine head **22** as at **22***a* (see Fig. 1) to control the amount of downward travel of the upper anvil member **80**.

Operation

In the operation of the machine involved in setting snap fasteners upon a reusable envelope, the envelope to be fed into the machine will usually be taken from the stack of envelopes in which the flaps of the envelopes will normally be in an extended position such as shown in Fig. 13. The first step is to manually fold the flap **18***c* of the envelope out of the plane of the envelope back

toward the envelope front 18*a* so as to initiate a fold along the scored line 18*d*. By slightly compressing the sides of the envelope inwardly the envelope pocket will be opened up sufficiently so that the envelope can be slipped over the converging ends 52*b* of the jig support arms 52 and assembled over the lower anvil plates 30 to a positive stop which is determined by the folded edge of the envelope abutting the end lugs 53*a* of the flap-positioning arms 53 as shown in Fig. 14 and in dot-and-dash outline in Fig. 7.

Because of the timing element involved in this machine it is necessary to feed a single socket element 10 and stud element 11 from a magazine chute (not shown) in the upper and lower feed tracks 85 and 47 respectively and advance said elements in their respective tracks by the pusher slides 86 and 48 to a position adjacent the upper and lower die units during the end stroke of a prior cycle of operations. The relative position of the elements at the end of a previous stroke is shown in dotted outline in Fig. 2.

When the envelope is assembled into the machine as described above the machine may be set into motion. During the first portion of an operation cycle the socket and stud elements 10 and 11 will be further advanced in the feed tracks and pushed respectively into the jaws 87 and 40 of the upper anvil member 80 and lower anvil plates 30 in alignment with the setting station of the machine. During the first period of the operation cycle the plunger 23 will move upwardly a slight amount so as to permit the upper pusher slide 86 to advance its complete distance without interference.

During the next portion of the operation cycle the upper anvil member 80 by reason of the cam plates 83 and their connection with the plunger 23 will convey the socket downwardly and outwardly to clear the free edge of the envelope flap 18*c* and thence under said flap to the position as shown in Figs. 6 and 15. In this position the upper anvil member 80 will contact the envelope front 18*a* and compress it against the lower anvil plates 30, and both the upper anvil member 80 and the lower anvil plates 30 serve to back up each other during the fastener setting operation. The upper anvil member 80 will remain in a stationary position as the upper plunger 23 descends to set the socket upon the envelope flap due to contact of set screw 99 with machine head 22, the slip connection of block 95 on plunger 23 permitting this effect.

During the period of the setting operation, the plunger sleeve 72 of the upper die unit will contact the envelope flap as held in biased position by the fingers 54 and press the same downwardly against the upper edge of the socket fingers 13. Continued downward motion of the sleeve 72 in conjunction with the socket fingers 13 will shear out the blank 74, thus self-piercing an opening in the envelope flap to accommodate the socket fingers. At the same time the flap will be forced against the socket prongs causing the latter to pierce through the flap as seen in Fig. 11 and leave the blank 74 resting on top of the socket fingers. When the envelope flap is pressed firmly against the socket base 12 with the latter resting on the anvil plate 80*b* the plunger sleeve 72 will come to rest while the setting die 70 continues its downward stroke causing the pointed ends of the socket prongs 14 to engage in the die recess 70*e* and bend them outwardly and downwardly against the upper face of the envelope flap to permanently secure the socket thereto. It will be understood that this upper face of the envelope flap will become the inner face of the flap when the latter is folded back in normally envelope closing position. During this period during which die 70 turns over the prongs 14 the sizing tool 78 will continue to descend with the die and pierce out a smaller blank 74*b* and force it down into the socket fingers 13 and leave only an annular ring 74*c* the remains of the original blank 74 resting on top of the socket fingers 13 (see Fig. 16).

During the same period as described for the setting operation of the upper die the lower die unit 28 will be moved upwardly by the lever 63. This upward motion of the lower die unit will first cause the cushioned sleeve 66 to contact the envelope back 18*b* forcing the same against the stud head 16 and in conjunction with said head pierce out a blank 18*e* and provide a suitable hole 18*f* in the envelope back to permit the stud head to be inserted therethrough. At the same time the envelope back will be forced against the stud prongs 17 causing the latter to pierce through the envelope material as the sleeve 66 rises to seat the envelope stock against the stud base 15 (see Fig. 10) after which the upwrad motion of the sleeve 66 will rest while the setting die continues to rise causing the stud prongs 17 to be rolled outwardly and downwardly against the outside of the envelope back.

During this period it will be understood that the inside surface of the envelope back and the stud base 15 will rest against the lower anvil plates 30. The blanks 18*e* which are pierced out of the envelope material are ejected through the tube 69.

During the end period of the operation cycle the lower die unit 28 will be withdrawn downwardly and the upper die unit will be withdrawn upwardly. During this final operation of the upper die unit the ejector sleeve 77 will function to force the socket finger 13 off of the sizing tool 78 and eject the socket 10 and ring 74*c* of envelope stock out of the plunger sleeve 72. At the same time the anvil member 80 will be retracted from underneath the envelope flap 18*c* and drawn upwardly and moved inwardly to the position as shown in Fig. 2 where the jaws 87 carried by said member 80 will line up with the socket feed track 85. Upward motion of the anvil member 80 will be stopped by the head of the set screw 99 abutting the screw 98. The plunger 23 will continue to rise until it is clear of the jaws 87. The final period of the cycle of the operation will move the upper pusher slide 86 and lower pusher slide 48 to advance respectively the socket 10 and stud 11 from the dotted line position as seen in Fig. 2 into fingers 87 and 40 in line with the setting station.

After the machine has completed its full cycle of operations the envelope to which the fastener elements have just been set may be manually removed from the jig support arms and another envelope inserted ready for the next cycle of operations.

The small blank 74*b* and ring 74*c* sheared out of the envelope flap will for the most part be discarded from the machine in the act of removing the envelope just operated upon.

Since various equivalent forms of construction will be apparent to those persons skilled in the art, it is his intention that the present invention should be interpreted as covering all modifications and equivalents within the scope and spirit of the attached claims.

What I claim is:

1. In a machine for attaching complementary snap fastener elements to an envelope wherein the fastener elements carry their own attaching prongs and the envelope flap is folded back toward the envelope front for the setting operation, an anvil and setting punch for each of said fastener elements arranged in axial alignment with each other, means for feeding one of said elements into the envelope pocket with the fastener prongs directed outwardly toward the envelope back, means for feeding the other element between the envelope front and flap with the prongs directed toward the envelope flap, and means for moving each of said punches toward their respective anvils for attaching the complementary elements to the envelope flap and back respectively.

2. In a machine for attaching complementary snap fastener elements to an envelope the combination as de-

fined in claim 1 wherein means are provided in the punches cooperating with the detachable engaging parts of the fastener elements for self-piercing the envelope stock coincident with the fastener setting operation.

3. In a machine for attaching complementary snap fastener elements to an envelope wherein the fastener elements carry their own attaching prongs and the envelope flap is folded back toward the envelope front for the setting operation, a stationary anvil adapted to have the open end of the envelope telescoped thereover, means for feeding one of said elements along the underside of said anvil to the setting station of the machine, a lower setting tool operated upwardly from the underside of said anvil, a feed track for conveying a complemental element, a movable upper anvil normally positioned in line with such feed track, holding jaws associated with said movable anvil, means for feeding said complemental fastener element into said jaws, means for moving said movable anvil downwardly to convey said complemental element to a position underneath the envelope flap in line with the setting station, an upper setting tool and means for simultaneously moving the upper and lower setting tools axially toward each other and in conjunction with said movable and stationary anvils serving to set said complementary fastener elements on said envelope flap and back respectively.

4. In a snap fastener attaching machine the combination as defined in claim 3 wherein jig means is provided for locating the envelope in definite relationship to the stationary anvil.

5. In a snap fastener attaching machine, the combination as defined in claim 3 wherein means are provided for imparting an outward and inward movement to said upper anvil during its downward movement, whereby said upper anvil may carry its fastener element under the folded flap of the envelope.

6. In a machine for attaching complementary snap fastener elements to an envelope wherein the fastener elements carry their own attaching prongs and the envelope flap is foldd back toward the envelope front for the setting operation, a lower stationary anvil adapted to have the envelope telescoped thereover, an upper movable anvil, means associated with each of said anvils for holding the complemental fastener elements in line with the setting station of the machine, means for feeding said fastener elements into the anvil holding means, means for moving said upper movable anvil to a position to deposit one fastener element underneath the envelope flap adjacent the lower stationary anvil, and upper and lower setting

tools cooperating with the upper and lower anvils to simultaneously set the complementary fastener elements on the envelope flap and back respectively in line with each other.

7. In a machine for attaching complementary snap fastener elements to an envelope, the combination as defined in claim 6 wherein the fastener holding means associated with the anvil are a pair of jaws for each anvil, which jaws operate to move away from the setting station axis during the setting operation for the purpose of releasing the jaw hold on the fastener elements.

8. In a machine for attaching complementary snap fastener elements to an envelope, the combination as defined in claim 6 wherein the upper setting tool is carried on the end of a vertically reciprocating plunger and the means for operating the upper movable anvil comprises a cam element operated by a friction connection with said plunger.

9. In a machine for attaching complementary snap fastener elements to an envelope as defined in claim 8 wherein means is provided to limit the distance of travel of the movable anvil as compared to the full length of travel of said plunger.

10. A fastener setting tool for setting snap fastener elements having integral prongs extending in the same direction from the fastener base as the fastener-engaging part of said element, which tool comprises a die sleeve having means for attachment to a reciprocating plunger, said sleeve having an annular end formed to upset the fastener prongs, and a cushion sleeve slidably fitted within said die sleeve for limited slidable movement therein, spring means urging said cushion sleeve outwardly to a stop position wherein one end projects beyond the upsetting end of the die sleeve and functions to force the prongs of the fastener through the material to which the fastener is attached.

11. A fastener setting tool as defined by claim 10 wherein the cushion sleeve coacts with the fastener-engaging part of the element to pierce out an opening in the material to which the fastener is attached to accommodate the fastener-engaging part.

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