

Feb. 27, 1962

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3,022,510

PLIERS TYPE SNAP FASTENER ATTACHING MACHINE

Filed April 4, 1960

2 Sheets-Sheet 1

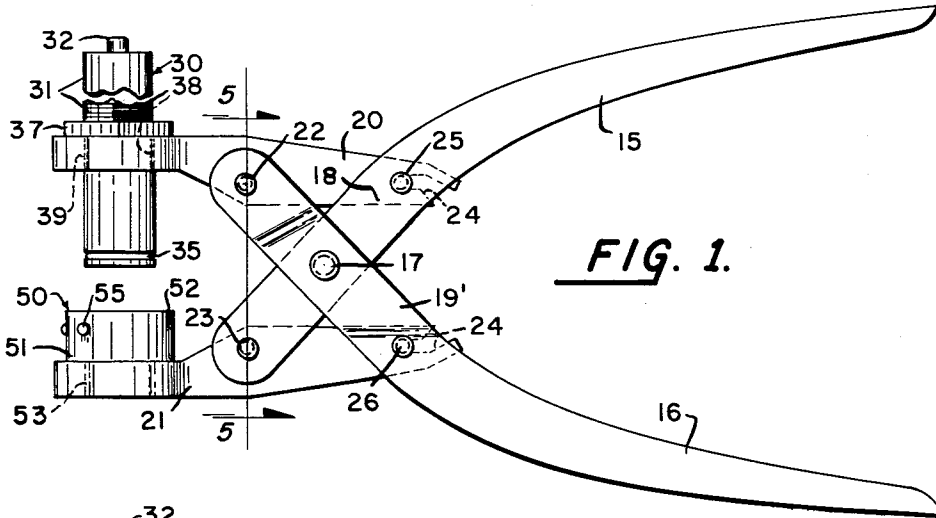


FIG. 1.

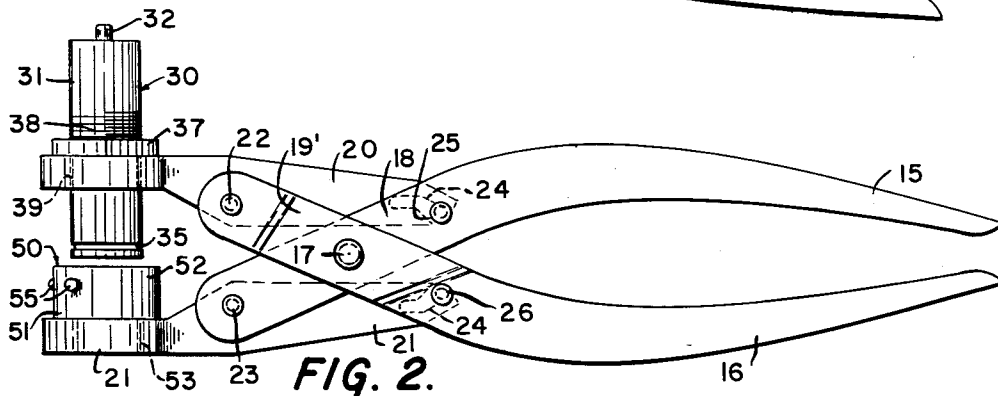


FIG. 2.

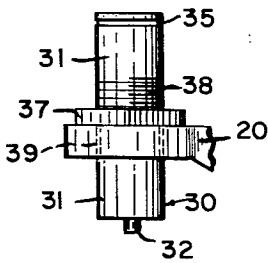


FIG. 3.

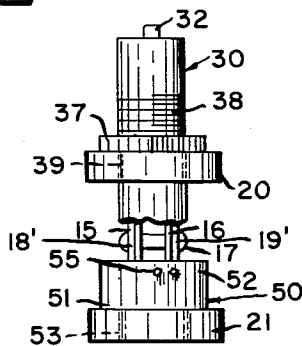


FIG. 4.

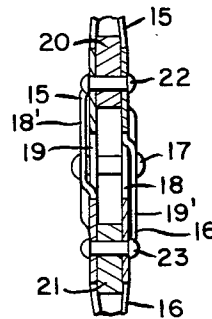


FIG. 5.

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2 Sheets-Sheet 2

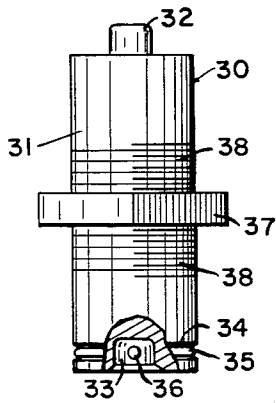


FIG. 6.

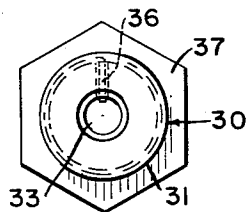


FIG. 7.

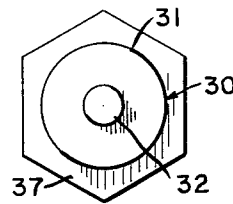


FIG. 8.

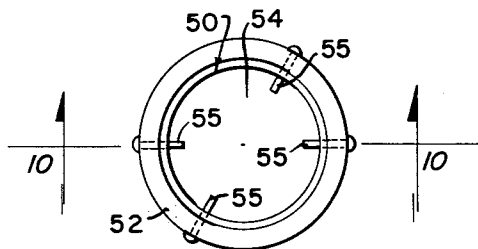


FIG. 9.

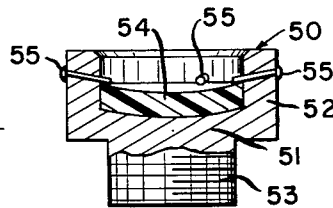


FIG. 10.

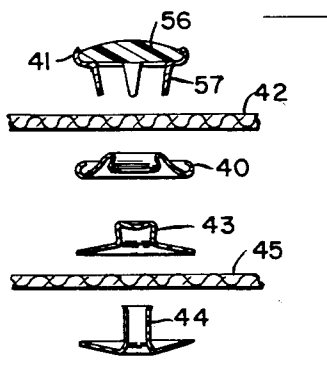


FIG. 11.

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3,022,510 PLIERS TYPE SNAP FASTENER ATTACHING MACHINE

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Filed Apr. 4, 1960, Ser. No. 19,530
6 Claims. (Cl. 1-50)

This invention relates to snap fastener attaching means and more particularly to a hand operated pliers type machine for attaching snap fastener elements to fabric garments or other articles.

The main object of the invention is to provide a pliers type of machine capable of exerting the pressure required to securely attach snap fastener members to fabric with relatively slight manual effort on the part of the user of the machine. This result is achieved by the construction and arrangement of a pair of pivotally connected pliers type handles and tool-carrying jaws. The jaws are pivotally connected to portions of the handles forwardly of the pivotal connection of the handles to each other in such manner that the jaws are substantially parallel to each other in either the open or closed position of the handles, and the tools carried by the jaws are moved in axial alignment toward and away from each other by pivotal movement of the handles.

Another object of the invention is to provide a reversible punch for applying different kinds of snap fastener elements to fabric.

Another object of the invention is to provide, in a machine of the character described, an anvil die adapted to receive snap elements of different shapes and sizes, and to support such elements efficiently for attachment to fabric garments or other articles.

Other objects and advantages of the invention will be apparent from the drawings and following specification.

In the drawings:

FIG. 1 is a side elevational view of a snap fastener attaching machine embodying my invention.

FIG. 2 is a view similar to FIG. 1, showing the machine parts in different positions.

FIG. 3 is a side elevational view of the forward end of the punch carrying jaw, showing the punch of FIGS. 1 and 2 mounted in inverted position in the jaw.

FIG. 4 is a front end elevational view of the machine showing the parts in the positions of FIG. 2, with the lower end of the punch broken away to disclose mechanism located rearwardly of it.

FIG. 5 is a transverse vertical sectional view in the plane of the line 5-5 of FIG. 1.

FIG. 6 is a side elevational view on an enlarged scale of the punch detached from the machine.

FIG. 7 is a bottom plan view and FIG. 8 is a top plan view of the punch of FIG. 6.

FIG. 9 is a plan view of the anvil die.

FIG. 10 is a vertical transverse sectional view in the plane of the line 10-10 of FIG. 9.

FIG. 11 is an exploded view showing in vertical section the two pairs of elements which constitute the upper and lower members of a snap fastener when attached to the fabric shown between the two elements of each pair.

In that embodiment of the invention shown in the drawings, identical pliers type handle members 15, 16, are pivotally connected together by a rivet 17. The forward portions of the handles are bifurcated so that each handle terminates in a pair of parallel, relatively thin side members. The side members 18 and 18' of the handle 15 are spaced apart from each other sufficiently to receive between them a jaw 20. The side members 19 and 19' of the handle 16 are spaced apart from each other sufficiently to receive between them a jaw 21. The two outer side members, 18' and 19', in the areas adjacent the piv-

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otal connection 17, are bent outwardly as indicated by the shade lines in FIGS. 1 and 2, and as shown in FIG. 5.

The forward ends of the side members 19, 19', of the handle 16 are pivotally connected to the jaw 20 by a rivet 22 which extends through both side members and the jaw 20. The forward ends of the side members 18, 18' of the handle 15 are pivotally connected to the jaw 21 by a rivet 23 which extends through both side members and the jaw 21.

The rearward ends of the jaws 20, 21, are slotted as indicated at 24. The slots extend inwardly of the jaws from their rearward open ends, first in a direction inclined to the horizontal, and then in a generally horizontal direction, the inclined portions of the slots 24 of the two jaws being inclined in opposite directions as shown in FIGS. 1 and 2. A pin 25 is fixed in and extends through the two side members 18, 18' of the handle 15 and through the slot 24 of the jaw 20. A similar pin 26 is fixed in and extends through the two side members 19, 19' of the handle 16 and through the slot 24 of the jaw 21.

FIG. 1 shows the jaws 20, 21 and handles 15, 16 in their open or spaced apart positions. FIG. 2 shows the same parts as they appear when the handles have been pressed together, resulting in movement of the jaws toward each other while maintaining their horizontal positions. The purpose of the described movement of the pliers type handles is to move the punch and anvil die which are mounted in the jaws 20, 21, respectively, toward each other in axial alignment. Said punch and anvil die carry the snap fastener elements intended to be attached to fabric garments or the like.

The punch 30 is reversible and comprises a shaft 31 provided at one end with a reduced diameter head 32, and at its opposite end with a stud receiving recess 33, a groove 34, and spring 35 with inturned spring finger 36. Intermediate its ends, the shaft has fixed thereon a collar 37 which may be integral with the shaft, and may be hexagonal or other shape. Screw threads 38 on the shaft 31 engage threads 39 on the internal surface of an opening in the forward end of the jaw 20 for mounting the punch 30 in the jaw and preventing relative longitudinal movement between them. The punch 30 may be mounted in the jaw 20 as shown in FIG. 3 where it functions as a socket punch, with the lower end head 32 in position to engage the socket 40, which cooperates with the pronged snap head 41 for attachment to the fabric 42. When the punch 30 is inverted and mounted in the jaw 20 as shown in FIGS. 1 and 2, it functions as a stud punch, with the lower end recess 33 and spring 35-36 in position to engage the stud 43 which cooperates with the snap post element 44 for attachment to the fabric 45.

In either of the described positions, the the punch 30 cooperates with an anvil die indicated as a whole at 50, mounted on the forward end of the jaw 21. The construction of the anvil die is shown in detail in FIGS. 9 and 10. It comprises a cup shaped body 51 provided with a circumferential side wall 52 and a depending base 53 for mounting it on the jaw 21. A resilient seat 54 rests in the cup shaped body, the upper surface of the seat being slightly concave. A plurality of bolts 55 extend radially through the side walls 52 and inwardly over the seat 54 a short distance. The bolts aid in positioning the snap elements to be supported thereon. The snap element may be either the pronged snap head 41 which is supported on the seat 54 with its curved surface 55 downwardly and its prongs 56 upwardly directed to engage the socket 40 on the punch 30, or it may be the snap post element 44 which is supported on the seat 54 to engage the stud 43 retained on the punch 30 by the spring finger 36.

As shown by a comparison of FIGS. 6 and 10, the

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diameters of the punch 30 and cavity of the anvil die 50 are such that the end of the punch 30 and the fastener element carried thereby enter the cavity of the anvil die so that two fastener elements are clinched together when the jaws reach closed positions.

A comparison of FIGS. 1 and 2 will show that manual closing of the handles 15, 16, that is, moving their rearward portions toward each other about the pivotal connection 17, transmits motion to the jaws 20, 21 in combined horizontal and vertical directions, whereby the jaws are moved forwardly and toward each other while they are maintained in substantially horizontal parallel relationship to each other. The closing pressure exerted manually by the user on the handles 15, 16, is automatically increased by the pressure which is imparted, when the handles approach closed position, by the pins 25, 26 bearing against the inclined surfaces which define the rearward ends of the slots 24 in jaws 20, 21. Thus the pressure required to firmly attach the fastener elements to the fabric 42, 45, by the tools mounted in the jaws, is exerted by relatively small manual pressure on the handles 15, 16.

Changes may be made in details of construction and in the form and arrangement of parts without departing from the scope of the invention as defined by the appended claims.

I claim:

1. A manually operated machine for attaching fastener elements to fabric and the like, comprising a pair of pliers type handles, means extending transversely through said handles between their ends, near their forward ends, pivotally connecting the handles together, a pair of jaws each having a free tool-carrying forward end and a slot in its rearward end, means pivotally connecting each jaw intermediate its ends to the forward end of one of the handles, a pin fixed in each handle rearwardly of the pivotal connection between the handles extending through the slot of a jaw and holding the jaws on the handles in substantially parallel relationship to each other when the handles are moved about their pivotal connection, and fastener attaching tools mounted in said jaws, each of said slots having an inclined bearing surface contacted by one of said pins, said bearing surfaces of the slots of the two jaws being rearwardly inclined toward each other, said pins engaging the forward ends of the slot surfaces when the handles are in open position and said pins being moved rearwardly in the slots into pressure exerting contact with said inclined bearing surfaces when the handles are moved toward each other, closing pressure manually exerted on the handles being transmitted by the pins to said jaws for moving the jaws toward each other and the transmitted closing pressure being automatically increased by the bearing pressure of the pins against said inclined surfaces at the rear ends of the slots when the handles approach closed positions.

2. The machine defined by claim 1, in which one of said fastener attaching tools is a punch provided externally intermediate its upper and lower ends, with screw threads and the forward end of one of the jaws is provided with an opening internally screw threaded and adapted to engage the threaded punch for mounting said punch in the jaw.

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3. The machine defined by claim 1, in which one of said fastener attaching tools is an anvil die which has a cup shaped body provided with a resilient seat supported in the body, and a plurality of bolts extending through the side wall of the body above the resilient seat.

4. A manually operated machine for attaching fastener elements to fabric and the like, comprising a pair of pliers type handles, the forward portions of said handles being bifurcated and forming relatively flat spaced apart side members on each handle, means extending transversely through said side members of the handles, near their forward ends, pivotally connecting the handles together, a pair of jaws each having a free tool-carrying forward end and a slot in its rearward end, each jaw being located between the side members of a handle, means pivotally connecting each jaw intermediate its ends to the side members of a handle, a pin fixed in each handle rearwardly of the pivotal connection between the handles extending through the slot of a jaw and holding the jaws on the handles in substantially parallel relationship to each other when the handles are moved about their pivotal connection, and fastener attaching tools mounted in said jaws, each of said slots having an inclined bearing surface contacted by one of said pins, said bearing surfaces of the slots of the two jaws being rearwardly inclined toward each other, said pins engaging the forward ends of the slot surfaces when the handles are in open position and said pins being moved rearwardly in the slots into pressure exerting contact with said inclined bearing surfaces when the handles are moved toward each other, closing pressure manually exerted on the handles being transmitted by the pins to said jaws for moving the jaws toward each other and the transmitted closing pressure being automatically increased by the bearing pressure of the pins against said inclined surfaces at the rear ends of the slots when the handles approach closed positions.

5. The machine defined by claim 4, in which one of said fastener attaching tools is a punch provided externally with screw threads intermediate its upper and lower ends, and the forward end of one of the jaws is provided with an opening internally screw threaded and adapted to engage the threaded punch for mounting said punch in the jaw.

6. The machine defined by claim 4, in which one of said fastener attaching tools is an anvil die which has a cup shaped body provided with a resilient seat supported in the body, and a plurality of bolts extending through the side wall of the body above the resilient seat adapted to center fastener elements in the die.

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