

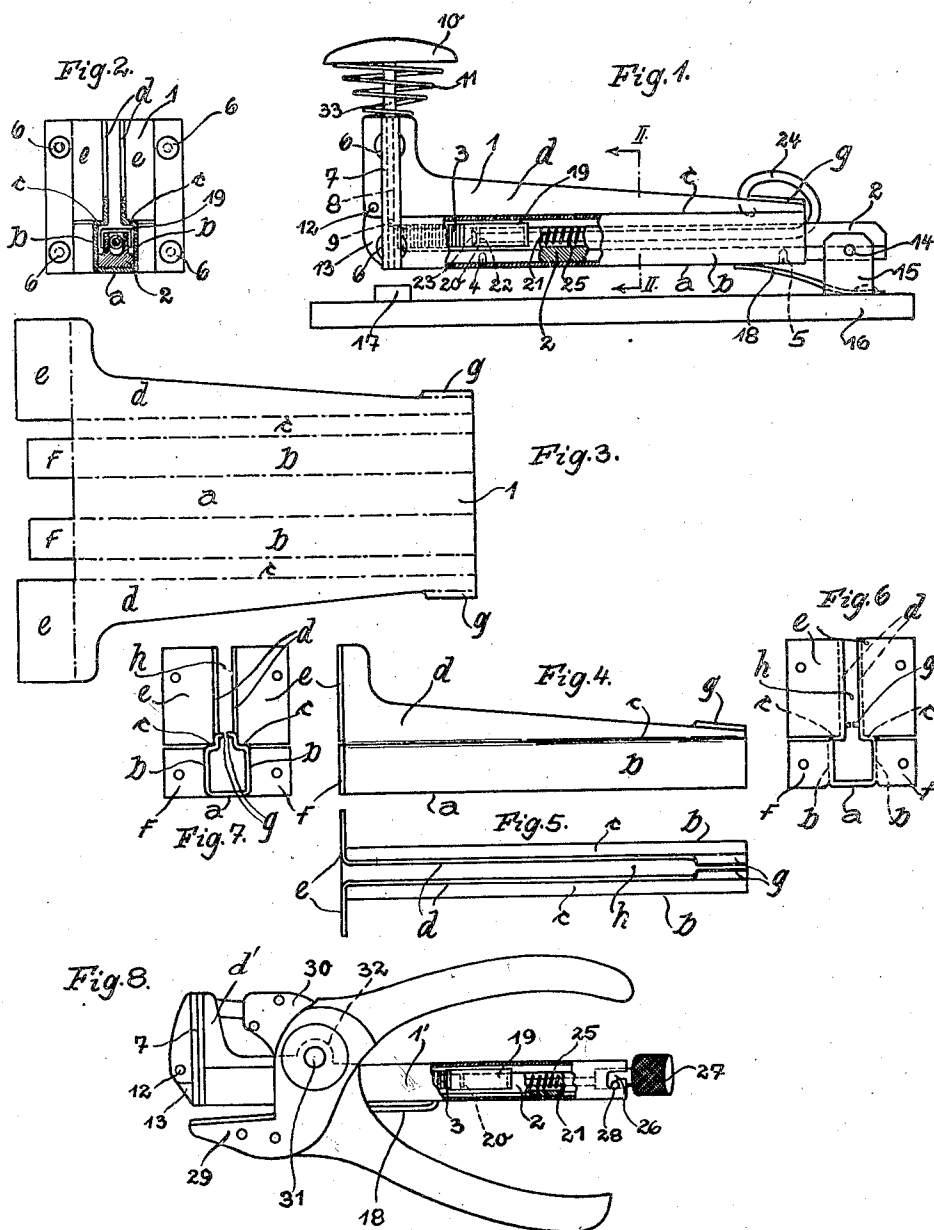
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STAPLING MACHINE

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STAPLING MACHINE

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2 Claims. (Cl. 1—3)

This invention relates to a stapling machine and has for its object, to produce an article which is simple to make and reliable in use. The main feature of the invention is the sheet metal casing bent into substantially U-shaped from a single piece accommodating the staple carrying device, and the sides of which are inwardly bent over the staple guide so that they form the upper boundary for guiding the staples. Further, flaps are laterally bent on the front end of the sheet metal casing for accommodating the staple ejecting device, whereas extensions bent downwardly from the rear end of the elongated element forming the staple guide constitute the holding means for the staple feeding device.

The novel shaping of the casing greatly simplifies the making of the machine and saves the special elements necessary in known machines of this type for guiding the staples on the staple support and for assembling the feeding arrangement.

A further feature of the invention consists in the conical spiral spring which holds the staple ram in inoperative position, as by making the spring in this shape the constructional height of the machine can be considerably reduced and moreover the striker knob is more easily held.

Two embodiments of the invention are illustrated by way of example in the accompanying drawing in which:

Fig. 1 shows a desk stapling machine in side elevation with part of the staple guide exposed.

Fig. 2 is a cross-section on line II—II of Fig. 1.

Fig. 3 shows in plan view a blank cut for producing the casing.

Fig. 4 is a side elevation of the finished casing.

Figs. 5, 6, and 7 illustrate the casing, shown in side elevation in Fig. 4, in top plan view, rear elevation and front elevation, respectively.

Fig. 8 is a side elevation of a stapling machine in the shape of a pair of tongs with casing formed according to the invention.

The casing 1 (seen from all sides in Figs. 4 to 7) of the desk stapling machine (Fig. 1) consists of a single piece of sheet metal, the original developed shape of which is shown in Fig. 3. By suitably bending at the points indicated in dotted lines, a channel-like elongated body is formed with lateral downwardly bent end flaps overlapping the same, the bottom portion of this body being designated by *a* and the side walls by *b*. The side walls *b* are bent inwards on the upper side forming shoulders *c* and continue thence as upper longitudinal ribs *d*, which impart the necessary rigidity to the casing. On the front end of

the casing the longitudinal ribs *d* are folded over to form end flaps *e*, which lie in the same plane as the also folded over extensions *f* of the side walls *b*. On the rear end of the inwardly bent shoulders *c* short extensions *g* are provided, which cover the longitudinal slot *h* between the shoulders *c*. A casing bent in this manner possesses considerable resistance against bending in all directions and against twisting, even, if it is made of thin sheet metal.

A U-shaped bar 2 is fixed by means of screws 4 and 5 (Fig. 1) in the elongated body of the casing 1 for accommodating the staples 3. The height of the side walls *b* of the casing is such as compared with the height of the bar 2, that the shoulders *c* cover the arms of the bar 2 leaving a space corresponding approximately to the thickness of the staples. By this arrangement the staples 3 are securely held in position on the bar 2 by the shoulders *c* of the casing 1. These shoulders consequently form the upper boundary of the staple guide and render unnecessary the special guide elements required in the known arrangements. The laterally bent flaps *e*, *f* on the front end of the elongated body accommodate by means of the screw bolts 6 a guide plate 7 for guiding the staple ram 8. This ram 8 slides in a longitudinal groove 9 of the plate 7, and its rear side bears against the flaps *e* and *f*. A rod 33 fixed on the staple ram 8 carries on its upper end a striker knob 10. A spiral spring 11 arranged between this striker knob and the guide plate 7 holds the staple ram 8 in the inoperative position and guides it towards and away from the object to be stapled upon a blow being struck on the knob 10.

As shown in the drawing the spiral spring 11 is of conical shape and can be pressed flat. The arrangement of the spring around the shank 33 is such that the wide coil engages in the cup-shaped striker knob, whereas the narrow coil bears against the casing. On the knob 10 being struck, the spring 11 is pressed flat and lies in the cavity of the knob 10. The guide rod or shank 33 can therefore be shortened by the amount to which the cylindrical spiral spring, usually employed at this point, could be compressed. By making the striker knob 10 of cup-shape with slightly inwardly bent edge, which is simply stamped or pressed in sheet metal or other suitable material, a special bearing for the spring is not required on the knob.

A nose 13 hinged to the guide plate 7 by means of a bolt 12 holds back the staple actually brought under the ram 8 from the staple ranging device

or guide bar 2. The construction and manner of operation of this nose does not form a feature of the present invention and is described more fully in my Patent 1,740,322. The staple support bar 2 is hingedly connected at its rear end by means of a pin 14 to cheeks 15 of a base plate 16, which forms the counter bearing for the staple ram 8. In the form of construction shown in Fig. 1 a separate anvil block 17 is provided on base plate 16 under the staple ram 8. A blade spring 18 fixed on the base plate 16 bears with its free end against the underside of the casing 1 and holds the ejecting device 7, 3 at a sufficient distance from the anvil 17, when the machine is in the inoperative position, so that the object to be stapled can be easily inserted.

After a blow has been struck on the knob 10 and caused the staple under the staple ram 8 to be driven out, the knob returns into its inoperative position, and the passage for introducing a fresh staple into the guide slot 9 under the ram 8 thus becomes free. The feeding of the staples is effected automatically by the arrangement hereinafter described. A rider 19, bent from sheet metal in staple shape, rides on the bar 2 carrying the staples behind the row of staples 3 at the opposite end to the ejecting device. A nose 20 on the web of the rider 19 is bent vertically downwards, so that it extends between the arms of the bar 2. A guide rod 21, on which the rider 19 is movably mounted by means of a bore 22 of the nose 20, lies between the arms of the bar 2 and is thickened at its end 23 so as to prevent sliding off of the rider 19. The other end of the guide rod 21 is bent to form a bow 24 which engages around the covering of the staple guide formed by the extensions *g* of the casing 1, so that it is prevented from shifting. A spiral spring 25 is wound around the rod 21 between the nose 22 of the rider 19 and the bow 24. This spring 25 at one end presses the rider 19 against the row of staples 3 and at the other end holds the bow 24 tightly against the extensions *g*.

For inserting a fresh row of staples, the bow 24 of the rod 21 is raised and can then be pulled out towards the rear. As the thickened end 23 of the rod 21 prevents the rider 19 from sliding off, this rider is removed from the machine with the rod, and the insertion of a new row of staples can be easily effected in a simple manner by sliding them onto the bar 2.

By making the casing in one piece of bent sheet metal, thus uniting a number of elements necessary for the construction and reliable working of the machine, the machine can be made very simple, its operation is particularly easy and its cost of production is considerably less than that of the known forms of construction.

Although the description is limited to the form of construction shown in Figs. 1 to 7, the construction of the machine can be changed without departing from the scope of the invention. Thus, for example, the guide and support bar 2 shown

in Figs. 1 and 2 worked from a piece of square iron can be bent U-shaped from sheet metal, and the base plate 16 may be stamped in sheet metal and suitably formed. Moreover, the invention is not limited to desk stapling machines but can be employed for all kinds of practical stapling machines.

Fig. 8 shows in side elevation a stapling machine in the shape of tongs provided with a staple guide, formed according to the invention, which tongs are actuated in known manner by pressing together the two jaws 29 and 30.

The casing 1' of the staple guide corresponds to the casing 1 of the desk machine (Fig. 1). However, for the extensions *g* arranged on the casing 1, which extensions form the holding means for the staple feeding device, an angular slot 26 on the rear end of the elongated body is substituted, in which the bow of the guide bar engages. Instead of the bow, a knurled head 27 is preferably placed on the rod 21 in this form of construction, and carries a laterally projecting pin to be inserted into the slot 26. The unfastening of the feeding device is effected in this form of construction by turning the knob 27. The two jaws 29 and 30 of the tongs, which approach each other when operating the device, are mounted in eyes 32 of the reinforcing ribs *d'* of the casing 1' by means of a bolt 31.

I claim:

1. A stapling machine, comprising a substantially U-shaped metal casing, a base, a staple support pivoted on said base and disposed in longitudinal direction in said casing but in spaced relation to the side walls thereof, the edges of the side walls of the casing being inturned to form the upper boundary for guiding the staples, substantially parallel up-rights at the front ends of said side walls, having laterally extending flaps, a vertical staple driver carried by said casing, the flaps forming the rear guide of the staple driver, the inturned flanges of the said walls, uprights and flaps being formed integral with the U-shaped casing and from a single piece of sheet metal.

2. A stapling machine, comprising a substantially U-shaped sheet metal casing, a base, a staple support pivoted on said base and disposed in longitudinal direction in said casing but in spaced relation to the side walls thereof, the edges of the side walls being inturned to form the upper boundary for guiding the staples, substantially parallel uprights at the front ends of said side walls having laterally extending flaps, a substantially vertical staple driver sliding thereby, the flaps forming the rear guide of the staple driver, a staple feeding device adapted to automatically feed the staples to the driver, and ears extending from the inturned flanges at the rear of the casing adapted to form fastening means for the feeding device and built integral with the U-shaped casing.

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