Dec. 15, 1964 R. LEFEBVRE 3,160,890

APPARATUS FOR APPLYING CLIPS

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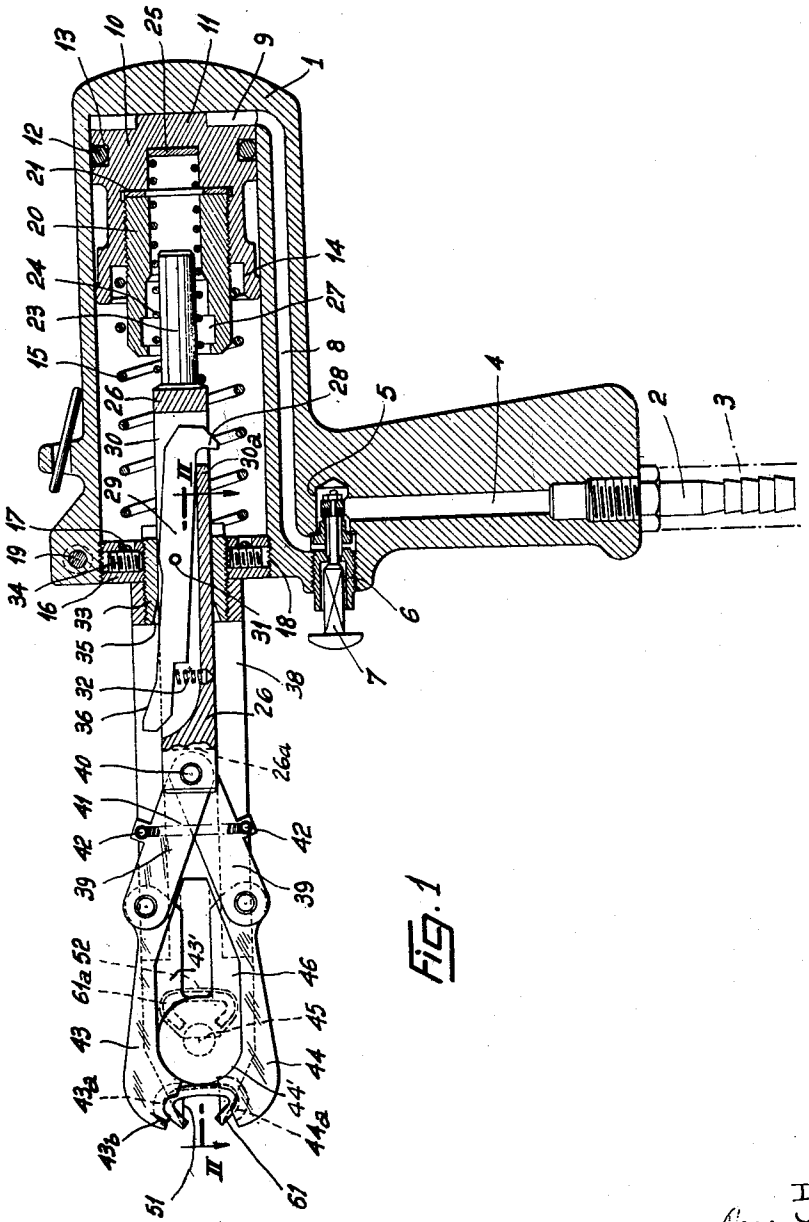


FIG. 1

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Fig. 3

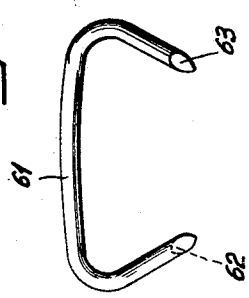


Fig. 2

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2 Claims. (Cl. 1—187)

The present invention is concerned with an apparatus for applying clips and, more particularly, clips which are in the form of a wire bent to the shape of a C, which is closed about the neck of a bag, flexible container or any other article, in order to close the said bag or the like.

Such apparatus generally comprises jaws pivotably mounted on a slide which is capable of sliding in front of a charging device containing a stack of clips. In the condition of rest, the jaws are situated slightly to the rear of the stack, an open clip being situated between them. When the apparatus is brought into action the said jaws advance, bring the clip into the application position, closing on the clip to clamp it about the neck of the bag, and then withdraw to take up the position of rest once more, taking a fresh clip from the stack contained in the charging device.

According to the present invention, the apparatus is so arranged that in the condition of rest the jaws occupy an advanced position, are opened and hold between themselves a clip ready for application. As soon as the apparatus is brought into action, the jaws close, apply the clip, withdraw to take a fresh clip from the stack contained in the charging device, and then take up the position of rest again.

By means of this apparatus, clips can be applied with very great accuracy since the clip ready to be applied can be placed directly at the place where it is to be fixed and, apart from the jaw closing movement, all the movements of the mobile parts of the apparatus are carried out when the clip has been applied.

The apparatus is preferably constructed in the form of a pistol which is very easily handled and is pneumatically operated and permits of obtaining a high rate of operation which may be as much as 100 strokes per minute.

The invention is illustrated by way of example in the accompanying drawings, in which:

FIGURE 1 is a longitudinal sectional view of an apparatus according to the invention;

FIGURE 2 is a plan view in section on II—II of FIGURE 1, and

FIGURE 3 is a view of a clip which can be applied by means of this apparatus.

In the construction shown in the drawings, the apparatus comprises a butt 1 to the grip of which there is connected a pipe socket 2 for connection to a compressed-air supply pipe 3. The pipe socket 2 is followed by a duct 4 debouching into a chamber 5 in which is accommodated a valve 6 controlled by means of a push button 7. The valve 6 makes it possible to allow the duct 4 to communicate with another duct 8 which terminates at the rear end of a cylinder 9 arranged in the butt 1.

Mounted in the cylinder 9 is a piston 10 whose rear face carries a boss 11 and which comprises externally a toroidal sealing ring 12 mounted in a groove 13.

The piston 10 is formed with a stepped cavity 14 against the larger step of which there bears the end of a compression spring 15 which tends to push the piston 10 towards the rear of the butt. At the opposite end, the spring 15 abuts on a centering ring 16 provided with a circular groove 17. The ring 16 is screwed into the tapped mouth 18 of the butt 1, the said mouth being split and provided with a locking screw 19.

Screwed into the middle step of the piston 10 is an attaching sleeve 20 which abuts on a washer 21 and into which is extended the end of a rod 23 which a compression spring 24 tends to move outwardly. This spring bears at one end against an abutment element 25 arranged at the end of the cavity 14 and at the other end on the body 26 of the rod 23. The front portion of the bore of the sleeve 20 has a sufficient diameter to enable the body 26 of the rod to be capable of penetrating therein and it is formed with a groove 27 intended to co-operate with a hook 28 of a lever 29 which is mounted in the slot 30 of the body 26, pivotally mounted on a transverse pin 31 and urged into contact with the bottom 30*a* of the slot by means of a spring 32.

The body 26 of the rod 23 issues from the butt through a bearing 33 screwed into the ring 16 and locked by means of countersunk screws 34. The bore of this bearing has a bevelled portion 35 which is adapted to co-operate with an oblique ramp 36 on the lever 29 to cause the lever to pivot in opposition to the action of the spring 32.

A plate 38 is screwed to the bearing 33 and locked thereto by means of a screw 37, and along the said plate the body 26 of the rod 23 (FIGURE 2) is adapted to be displaced. Provided on the outer end of this body are two links 39 pivotally mounted within a bifurcation 26*a* of the rod on a pin 40, and a tension spring 41 attached to pins 42 tends to return the said links towards one another.

Pivotally mounted on the end of the links 39 are jaws 43, 44 comprising curved grooves 43*a* or 44*a* adapted to receive a clip 61 for application. The jaws have mating thinner ledges or flanges 43' and 44', respectively, which pivot on a pin 45 carried by a slide 46 which is adapted to slide on the plate 38. The slide 46 has a guide heel 47 engaged in a slot 48 in the plate 38 (FIGURE 2). It is held in position by a strip 49 fixed by means of screws 50.

The plate 38 terminates at the front end in a bevelled nose 51 rearwardly of which there is provided an aperture 52 in the form of a trapezium with the rear angles rounded. Into this aperture there can fit the end of the channel 53 of a charging device 54 adapted to receive the clips which are to be applied by means of the apparatus. This charging device comprises a push member 55 sliding both in the channel and on a rod 56 carrying a long compression spring 57 arranged between the push member and a stop washer 58. The rod 56 terminates in a hook 59 which is engaged in a hole 60 in the channel after the charging device has been filled with clips.

In the present example, these clips 61 (FIGURE 3) are C-shaped. Their limbs terminate in opposed bevelled portions 62 and 63 which cause the said limbs to cross one another under the pressure of the jaws.

The apparatus which has just been described operates in the following manner:

In the condition of rest, the mobile mechanism of the apparatus occupies the position shown in FIGURE 1. The jaws 43, 44 are advanced and open. They contain between their noses, within the grooves 43*a*, 44*a*, a clip 61, and the first clip 61*a* of the stack contained in the charging device 54 bears against their central portion.

When pressure is applied to the push button 7 of the valve 6, the compressed air admitted into the duct 8 repels the piston 10 which advances, loading the spring 15 and urging the rod 23 forwardly, which causes the jaws 43, 44 to be closed and brings about the application of the clip 61. FIGURE 1 shows the jaw 43 provided with a small indentation 43*b* adapted to allow the passage of the point 62 or 63 of the clip when the said clip is closed. Furthermore, the spring 24 is compressed and the sleeve 20 by means of its groove 27 attaches itself to the nose 28 of the lever 29.

When the push button 7 is released, the valve 6 closes

the communication between the ducts 4 and 8, making the duct 8 communicate with the free atmosphere owing to the clearance provided about the stem of the push button. Owing to this fact, the piston 10 is moved rearwardly by the spring 15. First of all it brings with it the rod 23, 26, which causes the re-opening of the jaws 43, 44 and the withdrawal of these together with the slide 46. This withdrawal is sufficient for the noses of the jaws to move into a position rearwardly of the aperture 52 of the plate 38, which permits a new clip to be inserted between the jaws, which have indentations 43*a* and 44*a* adapted to receive such a clip.

The withdrawal of the rod 23 continues until the ramp of the lever 29 comes into contact with the bevelled surface 35 of the bearing 33. The tooth 28 is then disengaged from the groove 27 and the rod 23, 26 is returned forwardly by the spring 24, which ensures the shifting of the jaws and of the clip to the end 51 of the plate without, however, causing the jaws to close on the clip. The apparatus is ready to be used for a fresh application operation.

1. Apparatus for applying clips, comprising jaws for holding said clips, a frame along which said jaws can slide, a charging device associated with said frame, and a piston associated with a rod for controlling said jaws, said piston in a first stage repelling said rod to cause said jaws to close and then engaging said rod in opposition to a return spring, and, in a second stage, entraining said rod to return the jaws rearwardly of the charging device, the said rod then being disengaged and returned by said spring to the advanced position together with the jaws between which a fresh clip has been inserted, the piston being pneumatically controlled and its return movement being effected by a spring which is loaded during the advancing movement of the piston, the piston comprising a sleeve in which the rod can slide, said rod being provided with a lever adapted to latch onto the sleeve, and an abutment being provided on the means for guiding the rod to cause the disengagement of said lever.

2. Apparatus for applying clips, comprising jaws for holding said clips, a frame along which said jaws can slide, a charging device associated with said frame, and a piston associated with a rod for controlling said jaws, said piston in a first stage repelling said rod to cause said jaws to close and then engaging said rod in opposition to a return spring, and, in a second stage, entraining said rod to return the jaws rearwardly of the charging device, the said rod then being disengaged and returned by said spring to the advanced position together with the jaws between which a fresh clip has been inserted, the piston comprising a sleeve in which the rod can slide, said rod being provided with a lever adapted to latch onto the sleeve, and an abutment being provided on the means for guiding the rod to cause the disengagement of said lever, the rod return spring being a compression spring mounted in the sleeve of the piston and surrounding an end portion of the rod.

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