

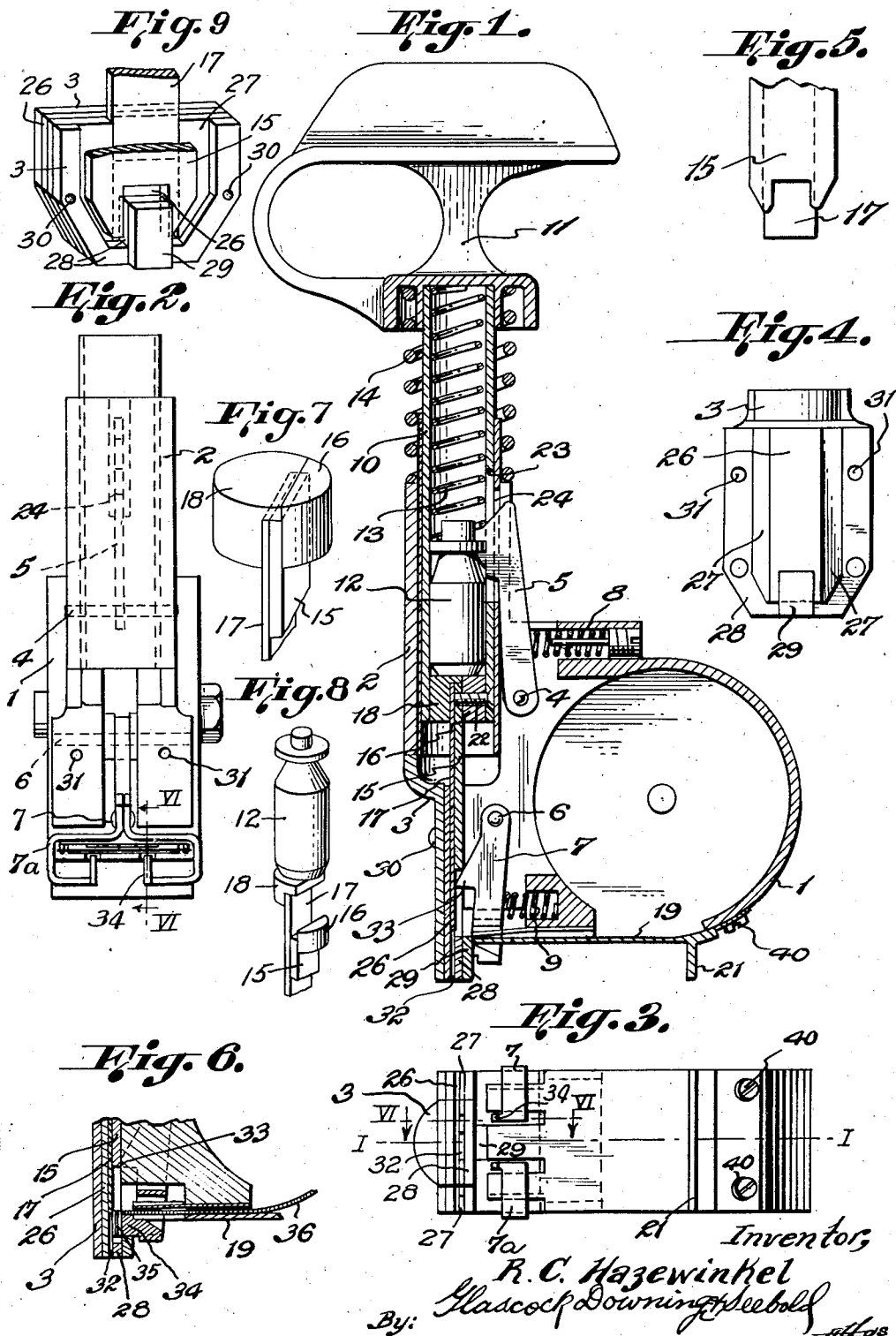
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APPARATUS FOR BENDING AND DRIVING IN STAPLES

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APPARATUS FOR BENDING AND DRIVING
IN STAPLESReurt Cornelius Hazewinkel, Zuilen-Utrecht,
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4 Claims. (Cl. 1-48)

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The invention relates to apparatus for bending and driving staples, which are arranged in the apparatus in the form of a flat band.

The apparatus according to the invention has the advantage that two functions, namely the bending and the driving of the staples are carried out separately by parts of the mechanism. Thus these parts can be constructed in such a manner as to be best adapted for the purpose. The invention relates to apparatus adapted to use a flat band of staple material and is constructed to be operated by one hand.

The apparatus is provided with a handle by which it is held and pressed against the material to be stapled and provided with two strips, one for bending the staples over an anvil rigidly connected to the body of the apparatus and the other for hammering the staple. Pawls are provided for releasing the strips one after the other. The propulsion of the staple band in a known manner is dependent on the position of these pawls with respect to the bending mechanism moved by the pressure on the handle.

According to the invention a spring is guided by a pawl, which holds fast the hammering mechanism during the bending of the staple and is raised when the bending of the staple is completed. Other means also guided by the position of the bending stamp, when the stamps have come back to about their starting position effects the propulsion of the staples, at the same time introducing one staple into the channel of the hammering stamp.

By so diverting all movement from the bending mechanism, it is possible to commence and to effect all necessary manipulations by one movement, so that the apparatus can be held fast and handled by one single hand. For the entire utilization of the to and fro moving stroke of the bending stamp it is efficient to guide the organ for the moving-up of the staple band, in such a way, that the moving-up pressure is exercised when the stamps have come back to their starting position.

Other features and objects of the invention will be apparent from a consideration of the accompanying drawing and the following description wherein an exemplary embodiment of the invention is disclosed.

In the drawing:

Fig. 1 is a sectional view of the apparatus taken on the line I-I of Fig. 3.

Fig. 2 is an end elevational view with the hood removed.

Fig. 3 is an inverted plan view.

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Fig. 4 is an enlarged elevational view of the hood.

Fig. 5 is an elevational view of an end portion of the bending and hammering stamps.

Fig. 6 is a sectional view taken on the line VI-VI of Figs. 2 and 3.

Fig. 7 is an enlarged perspective view of the top portion of the staple forming plunger and the driver.

Fig. 8 is a perspective view of the hammer illustrating the staple forming plunger in a depressed position.

Fig. 9 is an enlarged perspective view of the anvil and parts associated therewith.

The apparatus mainly consists of parts for the storage, the conduction and the propulsion of the staples, which are conveyed in the form of a flexible band, and of parts for the conduction and guidance of the driving and the bending hammering mechanism.

The casing 1 serves as container for the staples, which are connected to each other by their middle and form a flat band, which latter can be rolled up in its length. At the side of the container casing 1 is provided with a tube-shaped part 2 for housing and guiding the staple forming plunger and the driver. Against the casing 1 a hood 3 is mounted which is provided with guides for the bending and hammering mechanism. Furthermore two shafts are fixed in the casing 1. The shaft 4 pivotally supports a pawl 5 with which the hammering part of the driving is periodically held fast and a dog 7 is rotatably mounted on the shaft 6 serving for the propulsion of the staple band.

The pawl 5 and the dog 7 are biased by the springs 8 and 9 and are guided by the bending mechanism.

The driving mechanism includes a cylinder 10 and the handle 11. In the cylinder 10 a hammer 12 and a spring 13 are arranged. A spring 14 surrounds the cylinder 10.

The bending mechanism consists of a stamp or strip 15, which is provided with a pitchforked extremity and connected with a half circular cylinder 16. The hammering mechanism consists of a stamp 17, constituting a unit with the half circular cylinder 18, on which the hammer 12 strikes when the spring 13 is released.

The free extremities of the hood 3 and a strip 21 form legs on which the apparatus rests, when placed against a packing-case into which the staples are to be driven.

If the handle 11 is pressed down, the bending stamp 15, which is connected by a bolt 22 with the half circular cylinder 16 and the cylinder wall 10, follows the movement. The half circular cyl-

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inder 18 overlaps the cylinder 16 in such a way, that the part 18, though taken along in an upward direction by the part 16, is only coupled by friction to part 18, during the downward motion of part 16. After a certain stroke of the bending stamp, the pawl 5 is raised by the edge 23 of the cylinder 10. During this feeding period the spring 13 has been compressed. After the raising of the pawl 5, the spring 13 is released by which the hammering stamp 17 receives a strong stroke of the hammer 12. If the handle 11 is released, both stamps 15 and 17 are moved back to the starting position, after which the pawl 5 again locks the piston 12. The pawl pierces through a slit 24, which is provided in the cylinder 10.

During these motions the piston and the hammering stamp are guided in the hood 3. In the hood a fill plate 26, two strips 27, a U-shaped bent strip 28, and an anvil 29 are provided. The casing of the hood with the above mentioned parts are fastened by bolts 30 on the casing 1, for which purpose screw holes 31 are provided. The hammering stamp 17 fits exactly between the strips 27 and is a little less thick than these strips. When the hammering stamp is in a depressed position, it projects through an opening 32, which is formed between fillplate 26, and the edges of the strips 27. The bending stamp 15 fits exactly between the legs of the U-shaped strip 28. This stamp has a pitch-forked extremity, the form of which matches that of the U-shaped strip. The bending of the staple is effected by the pitchforked extremity of the stamp 15, which bends the staple around the anvil.

Before the thus bent staple can be driven home by stamp 17, the staple must first be moved horizontally so that it comes to lie above opening 32. This is what dog 7 serves for. This dog is turned against the force of the spring 9 of the hood 3, when the bending stamp 15 presses against the nose 33 of the dog 7. The dog 7 is provided with two arms 7a the extremities 34 of which press against the bent staple, when springing back. In consequence the bent staples are shifted in a horizontal direction, so that they are shoved into positions in alignment with the opening 32. As the bent staple is still fixed to the other remaining staples, a new staple is thus brought under the pitchfork.

It is not necessary that in one working-movement, by pushing the handle 11 down once, a staple be bent and the immediately annexed one be hammered home, but between these a certain difference may exist, dependent on the difference in thickness of the two stamps 15 and 17. In the execution example Fig. 6 this difference is three. By this the advantage is obtained that each staple is bent three times by the stamp 15 before this staple reaches the opening 32, by which is avoided that the bent staples acquire a slanting position, which would hamper the passage. In Fig. 6 the moment is represented in which the dog 7 during the upward movement of the stamps is still just retained.

In Fig. 6 the three bent staples are represented at 35. The flat staple band is shown at 36 and this band may be coiled in the casing 1 so as to store about five thousand staples therein. The staple band is guided from the casing 1 to the anvil by means of a plate 19. The plate 19 is secured to the casing 1 by screws 40.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an apparatus for bending and driving

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staples formed from a flat band of staple material, an anvil, a strip having prongs for bending the staples over said anvil, a hollow shaft connected with said strip, a hammer, a spring interposed between the hammer and one end of said shaft, a pawl for retaining said hammer, a strip for severing staples and hammering said staples when the pawl holding the hammer is released, means to release said pawl at the end of the stroke of the bending strip, means for guiding said strips in said hollow shaft, and means for feeding the staple material.

2. In an apparatus for bending and driving in staples formed from a flat band of staple material, an anvil, a strip having prongs for bending the staples over said anvil, a hollow shaft connected with said strip, a hammer, a spring interposed between the hammer and one end of said shaft, a pawl for retaining said hammer, a strip for hammering the staples when the pawl holding the hammer is released, means to release said pawl at the end of the stroke of the bending strip, two plungers one forming part of the bending strip and the other a part of the strip for severing and hammering the staples.

3. In an apparatus for bending and driving in staples formed from a flat band of staple material, an anvil, a strip having prongs for bending the staples over said anvil, a hollow shaft connected with said strip, a hammer, a spring interposed between the hammer and one end of said shaft, a pawl for retaining said hammer, a strip for hammering the staples when the pawl holding the hammer is released, means to release said pawl at the end of the stroke of the bending strip, two plungers one forming a part of the bending strip and the other a part of the strip for severing and hammering the staples, one of said plungers having a notch cooperating with the other plunger in such a manner that the strip for severing and hammering the staples is retracted together with the strip for bending the staples.

4. In an apparatus for bending and driving in staples formed from a flat band of staple material, an anvil, a strip having prongs for bending the staples over said anvil, a hollow shaft connected with said strip, a hammer, a spring interposed between the hammer and one end of said shaft, a pawl for retaining said hammer, a strip for severing and hammering the staples when the pawl holding the hammer is released, said strip for bending the staples having a greater thickness than the strip for hammering the bent staples so that the staples are bent as many times as the bending stamp is thicker than the driving strip before being driven.

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