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O. SEIZER

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PNEUMATICALLY OR HYDRAULICALLY ACTUATED TOOL

Filed March 3, 1931

Fig. 1.

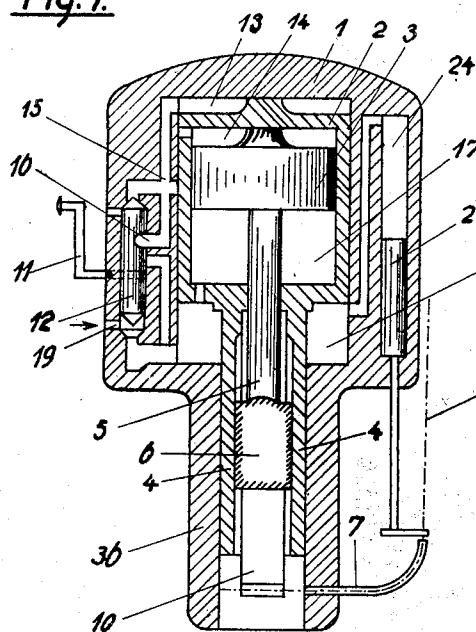


Fig. 2.

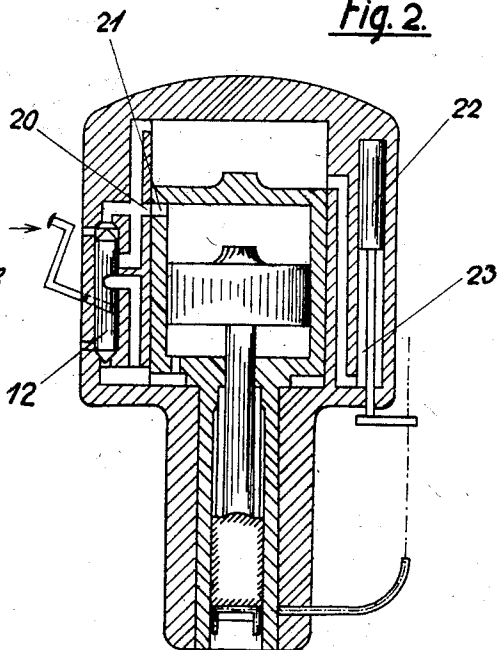


Fig. 4.

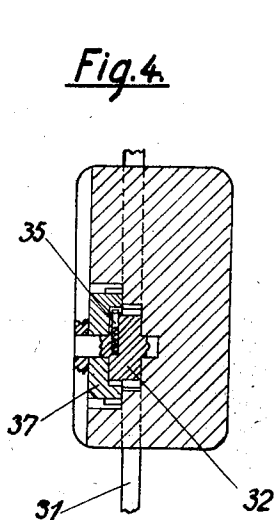
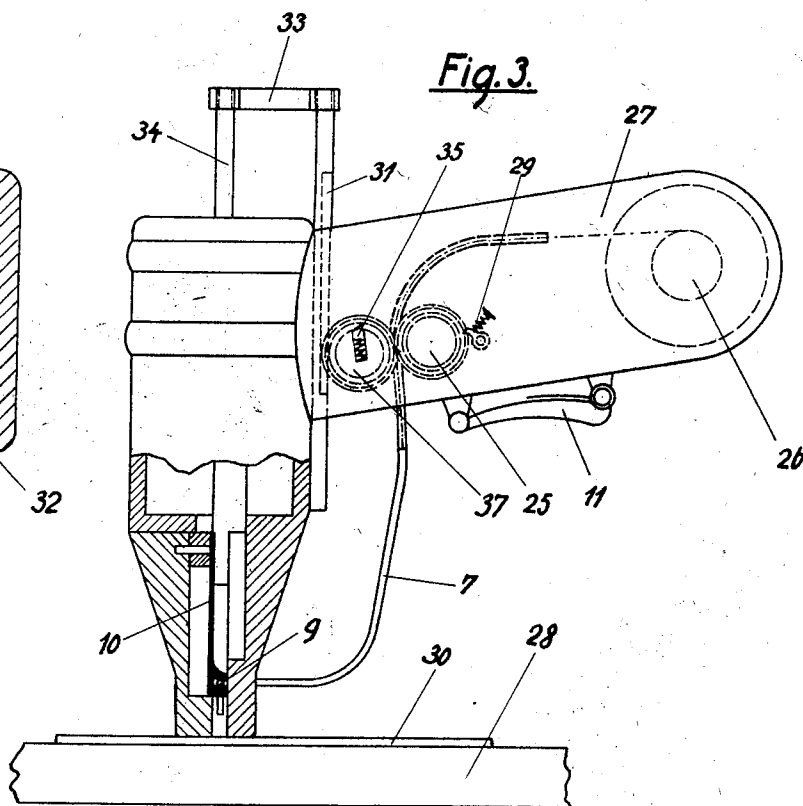


Fig. 3.



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PNEUMATICALLY OR HYDRAULICALLY ACTUATED TOOL

Application filed March 3, 1931, Serial No. 519,887, and in Germany October 26, 1929.

It has hitherto been customary in carriage building and in furniture factories to secure cloth, leather, artificial leather and the like to wooden parts by means of wire nails driven in by hand. This method of fastening is very complicated and occupies a great deal of time.

The object of the present invention is to simplify the fastening of upholstering material, by driving in individual stitching clips or staples by means of a pneumatically or hydraulically actuated tool, the cutting off, bending over and driving in being effected for example by means of two pistons, which are movable relatively to a casing and to one another, and which overtake one another at the end positions, in such a way that one piston moving in advance cuts off the wire and bends it over, and the other overtaking the first drives in the clip thus formed.

The cutting off and bending round of the wire are preferably effected by means of the outer piston and the hammering in by the inner piston. The tool is provided with a special device for feeding the wire. This device may be driven either by the pressure fluid or by rodding from one of the two pistons. The wire is preferably rolled up and lodged in the device.

One constructional form of the invention is illustrated by way of example in the accompanying drawings, the motive fluid being assumed to be compressed air, which is particularly suitable for this purpose.

In these drawings,

Figure 1 shows the device diagrammatically in longitudinal section, both pistons being in their uppermost position.

Figure 2 shows a longitudinal section similar to Figure 1, but with a different piston position. In the wire-feeding piston, instead of the duct leading the air over the piston, the duct leading the air under the piston is shown.

Figure 3 shows a practical construction of the device in side elevation, partly in section, and

Figure 4 shows a cross section through the wire-feeding device shown in Figure 3.

In the diagrammatic constructional view, 1

denotes the casing, in which a hollow piston 2 is guided. In the interior of the hollow piston 2 runs a piston 3. To the piston 2 are connected underneath two bars 4, which are guided in an extension 36 of the casing. Between the bars 4 is guided an expansion 6 of the piston rod 5 of the piston 3. Through a tube 7 is supplied a wire 8, which at first rests in a groove 9, in a resilient tongue 10, as shown in Figures 1 and 3. A valve body 12, adjustable by means of a bent lever 11, controls the compressed air. Figure 1 shows the device in the initial position. The two pistons are in their uppermost position. The space 13 above the outer piston 2 communicates with the atmosphere by a duct 15 and a recess 16 in the valve body 12, and the spaces 17 and 18 underneath the piston are connected by a bore 19 with the compressed air supply.

If the valve body 12 is adjusted by means of the lever 11, the spaces 17 and 18 underneath the pistons are connected with the atmosphere, and the space 13 above the piston 2 with the compressed air. The piston 2 now descends, the bars 4 cutting off the stitching wire 8 and bending it round, and the said stitching wire then being held by the resilient tongue 10. As soon as the piston 2 has reached its lowest position, the aperture 20 sets free the passage 21 to the space 14, and the piston 3 is thrown downwards inside the piston 2, pushes the spring 10 to the side, and hammers in the stitching clip. During these operations the lower piston spaces 17 and 18 are at atmospheric pressure. The feeding of the stitching wire, as diagrammatically indicated in Figures 1 and 2, may be effected in such a way that during the ascent of the two pistons 2 and 3, the piston 22 is pressed downwards by the compressed air through a distance corresponding to the length of the wire nail to be supplied. As soon as the pistons 2 and 3 descend, the piston 22 ascends again. It is controlled in a simple manner by the fact that the space 23 beneath it communicates with the space 13 above the piston 2, and the space 24 above it communicates with the space 18 underneath the piston 2. The connecting of the wire with

the piston must be carried out in such a way that the descending piston takes the wire with it, while the ascending piston releases it.

In the constructional form illustrated in Figure 3, the stitching wire is fed by means of two rollers connected with toothed wheels 25 and 37. The toothed wheels mesh with one another. The toothed wheel 37 is rotatably mounted upon the hub of the toothed wheel 32, which meshes with a rack 31. The latter is connected by a crosshead 33 with the upwardly prolonged piston rod 34 of the inner piston, so that they move together. In the hub of the toothed wheel 32 is guided a spring pin 35, the upper bevelled surface of which engages in a recess in the toothed wheel 37 in such a way that the latter is carried along with it when the toothed wheel 32 is rotated by the ascending rack 31. When the rotation is in the opposite direction the pin yields under the action of the inclined surface and the toothed wheels 37 and 25 remain at rest. In this position the wheel 25 is secured by a spring detent 29. If the inner piston now ascends, that is to say, returns into its initial position illustrated in Figure 1, the stitching wire is displaced by the toothed wheels 37 and 25, while the descending rack exerts no action upon the rollers. The stitching wire then enters the groove 9 in the resilient tongue 10. The latter is preferably placed in the plane of the feed passage 7 for the stitching wire 8, that is, 90 degrees from the position shown in Figure 3.

The butt 27 of the revolver-shaped casing is adapted to contain a spool 26 of staple material. 28 denotes a wooden piece to which a cloth 30 is secured.

What I claim is:

1. In a device for securing cloth, leather, paper and similar materials to members made of wood or similar materials, wherein the fastening is effected by means of staples cut off from a suitable material supplied, two rams controlled by fluid pressure in one stroke, one of which cuts off the material supplied for the staples and bends it into staple form, and the other is thereupon moved forward relatively to the first and hammers in the cut and bent staples.

2. In a device for securing cloth, leather, paper and similar materials to members made of wood or similar materials, wherein the fastening is effected by means of staples cut off from a suitable material supplied, a ram for cutting off and bending the material supplied, a piston actuated by fluid pressure for driving forward the said ram, a second ram for hammering in the staples cut and bent by the first ram, the second ram being located inside the first ram, and a second piston actuated by fluid pressure for driving forward the second ram.

3. In a device for securing cloth, leather, paper and similar materials to members made

of wood or similar materials, wherein the fastening is effected by means of staples cut off from a suitable material supplied, two rams located one inside the other, a hollow piston actuated by fluid pressure connected with one of the rams, and a second piston connected with the other ram, the second piston being slidably arranged in the first piston in such a way that in the end position of the first piston pressure is applied to the second piston, which pushes forward the ram connected with it relatively to the first ram and beyond the latter.

4. In a device for securing cloth, leather, paper and similar materials to members made of wood or similar materials, wherein the fastening is effected by means of staples cut off from a suitable material supplied, means actuated by fluid pressure for cutting off, bending and hammering in staples of the suitable material supplied, and means actuated by fluid pressure for feeding the said staple material to the cutting position, the said feeding means gripping the staple material and displacing it forward when moving in one direction but releasing it when moving in the other direction.

5. In a device for securing cloth, leather, paper and similar materials to members made of wood or similar materials, wherein the fastening is effected by means of staples cut off from a suitable material supplied, means actuated by fluid pressure for cutting off, bending and hammering in staples of the suitable material supplied, means for feeding the said staple material to the cutting position, reciprocating means actuated by fluid pressure and capable of moving the said feeding means in the feeding direction only, and ratchet mechanism adapted to prevent the feeding means from moving in the opposite direction.

In testimony whereof I affix my signature.
OTTO SEIZER.