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STAPLING MACHINE FOR SIMULTANEOUSLY
INSERTING AT LEAST TWO STAPLES

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2 Sheets-Sheet 2

FIG:2

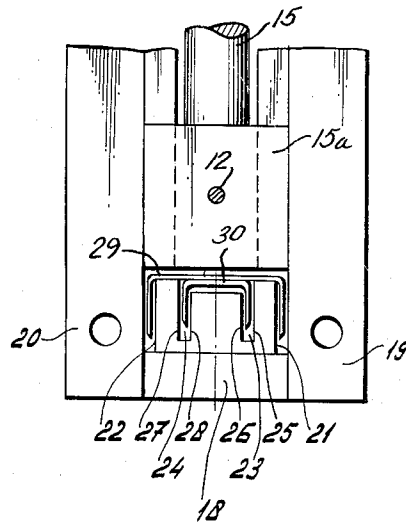


FIG:3

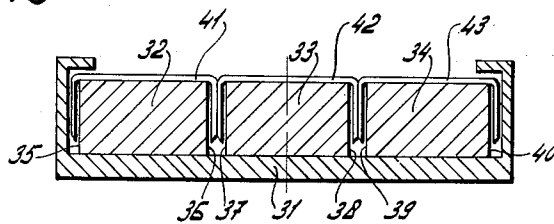
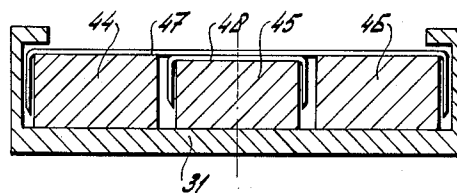


FIG:4



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STAPLING MACHINE FOR SIMULTANEOUSLY INSERTING AT LEAST TWO STAPLES

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4 Claims. (Cl. 1-49)

This invention relates to a stapling machine.

The conventional devices used for connecting together two or more bodies or layers by means of staples are adapted to apply only a single staple at every operation of the device. If occasionally it is desired to increase the strength of the joint effected by the stapling machine at a definite place, it is necessary to proceed in such a manner that two or more staples are consecutively and separately inserted by said stapling machine in close proximity of each other at the desired place. If such operations have to be carried out repeatedly and at several places, this will require much time and labor. Moreover it will be difficult to obtain a regular positioning of the separate but closely adjoining staples, so that the connected bodies or layers will have an unattractive appearance, which is in many cases not permissible, especially when this fastening method is used in the furniture industry or in building structures.

It is an object of this invention to obviate these difficulties and to provide a stapling machine which permits the application of two or more staples simultaneously at every operation thereof.

According to the invention the stapling machine comprises in combination at least two guides, so arranged as to enable the location of at least two separate staple strips in said stapling machine, and feeding means to move said staple strips simultaneously along said guides towards a staple driving mechanism adapted to act on a staple of each of said staple strips, so as to enable the simultaneous insertion of at least two staples in the bodies to be connected together.

A further object of the present invention is to provide the stapling machine with guides arranged in parallel relation, the one within the other, so as to enable the insertion of staples of different width with adjoining backs.

A still further object of the invention is to provide the stapling machine with feeding means comprising a common member for advancing the several separate staple strips.

Other objects, features and details of the present invention will become evident from the following description with reference to the accompanying drawings, in which particular embodiments of the stapling machine according to the invention and of the guides therein have been shown by way of example. In the drawings:

Fig. 1 is a perspective view of a stapling machine comprising two guiding blocks which are arranged beside each other, the front plate of the machine being moved upwards to show said guiding blocks.

Fig. 1a is a fragmentary, central, longitudinal section of the stapling machine of Fig. 1, but with the front plate lowered to its normal position.

Fig. 2 is a partial front view of a stapling machine adapted to simultaneously drive a narrow staple and a broader staple located thereabove, the front plate of the machine being again moved upwards.

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Fig. 3 is a cross-sectional view of three guiding blocks of equal height arranged beside each other and adapted to be used in a stapling machine according to the invention.

Fig. 4 is a cross-sectional view similar to that of Fig. 3, but wherein the middle one of the guiding blocks is of less height than the guiding blocks at the opposite sides thereof.

Referring to Fig. 1 of the drawings, the body 1 of the stapling device has at one end the staple driving mechanism 2, and at the opposite end a suitable handle 3, by which the stapling device can be easily held and manipulated. The body 1 is composed of a bottom plate 4 and two side walls which are bent inwardly at the top edges, as at 5 and 6, and are secured to said bottom plate. Between the side walls of the body 1 and on top of the bottom plate 4, two spaced apart, parallel guide blocks are arranged and define four side walls 7, 8 and 9, 10, respectively, which are all of the same height. Said side walls 7, 8 and 9, 10 constitute the guides for two staple strips, not shown, to be introduced into the machine in lateral adjoining relation. A staple driver 15a (Figs. 1a and 2) forms part of the staple driving mechanism 2 and is guided in a vertical longitudinal slot 13 of the front plate 11 by means of a headed pin 12. The driver 15a is secured to an actuating shaft 15. Said shaft 15 is provided with a head 14 and is surrounded by a helical spring 16 interposed between said head 14 and a suitable abutment surface on the housing for the staple driver, as shown on Fig. 1a. The width of the staple driver is slightly greater than the distance between the outer side walls 7 and 10 and substantially equal to the inner width of the body 1. The side walls 7, 8, 9 and 10 of the guide blocks are of less height than the side walls of the body 1 so that a staple receiving clearance will be provided between the top surfaces of the guide blocks and the inwardly turned portions 5 and 6 of the body side walls.

The machine is provided with a common feeding member 17 suitably guided in the body side wall portions 5 and 6 and having a width which is substantially equal to the internal width of the body 1. Said common member 17 extends across the side walls 7, 8, 9 and 10 and is resiliently urged, for example, by a coiled spring 17a (Fig. 1a), which is connected thereto and to a shaft 17b within a housing 17c against the rear ends of the inserted staple strips. By means of this common member 17 the staple strips will be simultaneously pushed forward toward the staple driving mechanism 2.

An alternative construction of a stapling machine according to the invention is shown in Fig. 2, said machine comprising a thick bottom piece 18 and two side walls 19 and 20 rigidly secured thereto. Upon the bottom piece 18 and between the side walls 19 and 20 a guiding block for the staple strips is provided, said block having outside wall surfaces 21 and 22 and two internal grooves 23 and 24 defining parallel side walls 25, 26 and 27, 28, respectively. The outside wall surfaces 21 and 22 of the guiding block constitute one guide which extends along nearly the whole length of the body of the stapling machine. This guide is destined to carry a broad staple strip 29. The innermost side walls 26 and 28, which have a smaller height than the side walls 25 and 27, constitute a second guide which is intended to carry another staple strip 30 of smaller width than the first strip 29 and situated therebelow. The staple strips 29 and 30 are simultaneously moved forward towards the staple driver which will simultaneously sever from said strips two staples located above each other.

In the embodiment of Fig. 3 the bottom piece 31 carries three separate guiding members 32, 33 and 34 arranged in parallel spaced relation and having parallel

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side walls 35—36, 37—38 and 39—40 respectively, said guiding members being of the same height and adapted to carry three laterally adjoining staple strips 41, 42 and 43 respectively, so that at every operation of the staple driver three staples will be simultaneously applied into the objects to be connected together.

As shown in Fig. 4 a similar device having three guiding members 44, 45, 46, of which the centrally located member 45 is, however, of lower height, may be used for the simultaneous application of two staples, viz. a broad staple from a staple strip 47 embracing the outer guiding members 44 and 46, and a staple of smaller width from a staple strip 48 embracing the centrally located guiding member 45 and situated below the broader strip 47.

What I claim is:

1. A stapling machine for stapling together a plurality of bodies; said stapling machine comprising means defining at least two parallel guides each forming a staple receiving space which, at least in part, adjoins the corresponding part of the staple receiving space formed by another of said guides to receive a strip of separable U-shaped staples with the staples in each guide having portions thereof abutting corresponding portions of the staples in the other of said guides, a staple driving mechanism at one end of said guide defining means and including a common driving member extending across all of said guide to simultaneously drive staples from the several strips and in contact with each other, and feeding mechanism operative to effect simultaneous feeding movement of the staple strips in said guides toward said staple driving mechanism.

2. A stapling machine according to claim 1; wherein said feeding mechanism includes a single common feeding member extending across all of said guides to act simultaneously on the strips of staples in said guides.

3. A stapling machine according to claim 1; wherein said guide defining means includes an elongated body

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having parallel, upstanding side walls, and at least two elongated guide elements of substantially rectangular cross-section spaced laterally from each other and from the inner surfaces of said body side walls so that a strip of U-shaped staples can be slidably disposed on each guide element with the side legs of the staples on each guide element adjoining the corresponding side legs of the staples on the adjacent guide element.

4. A stapling machine according to claim 1; wherein said guide defining means includes an elongated body having parallel, upstanding side walls, and three elongated guide elements of substantially rectangular cross-section spaced laterally from each other and from the inner surfaces of said body side walls, the central one of said guide elements having its top surface disposed below the top surfaces of the guide elements at the opposite sides of said central element so that a strip of relatively narrow U-shaped staples can be slidably disposed on said central guide element while a strip of relatively wide U-shaped staples can slidably straddle said guide elements at the opposite sides of the central element with the portions of said relatively wide staples connecting the legs thereof being in covering and contacting relationship with the corresponding portions of the relatively narrow staples.

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