DEEP THROAT STAPLER

Herbert W. Marano, Summit, N. J., assignor to Wilson Jones Company, Elizabeth, N. J., a corporation of Massachusetts

Application February 7, 1957, Serial No. 638,880

6 Claims. (Cl. 1—3)

The present invention relates generally to an improved fastener driving device, and in particular it relates to an improved deep throat stapling device.

It is often necessary both domestically and commercially to apply fasteners, such as staples, to areas far removed from the edge of the workpiece. An example of the above in the domestic field is the necessity of securing a paper pattern or portions thereof to a layer of fabric to facilitate the proper cutting of the fabric. In cases such as this a deep throat stapler is highly desirable. However, heretofore, deep throat staplers have been bulky, heavy and expensive and, as a result, have found little acceptance in the domestic field.

In order to effect the proper clinching of a staple, whether permanently or temporarily, it is necessary to drive the legs of the staple against a suitably shaped anvil to effect the infolding or outfolding of the staple legs. The anvil recess must be in correct alignment with the driven staple or else the satisfactory folding of the staple legs is not achieved. Heretofore, the mechanisms required to support the anvil in suitable alignment with the driven staple have been heavy, bulky and expensive, and hence unacceptable for domestic or other limited use.

It is therefore a principal object of the present invention to provide an improved fastener applying device.

Another object of the present invention is to provide an improved stapling device.

Still another object of the present invention is to provide an improved, light-weight, deep throat stapler.

Still a further object of the present invention is to provide an improved light-weight, deep throat stapler characterized by its simplicity and low cost.

The above and other objects of the present invention will become apparent from a reading of the following description, taken in conjunction with the accompanying drawings, wherein

Figure 1 is a front elevational view of an improved deep throat stapling device embodying the present invention;

Figure 2 is a top plan view thereof;

Figure 3 is a detailed view of the stapling head partially in section and illustrated in open condition;

Figure 4 is a front elevational view of the improved device;

Figure 5 is a rear elevational view; and

Figure 6 is a sectional view taken along line 6—6 in Figure 2.

In a sense, the present invention contemplates the provision of an improved stapling device comprising a pair of normally diverging elongated arms having their trailing ends secured to each other and having upwardly directed side borders, said arms having confronting faces of complementary configuration and being moveable into substantially nesting relationship, the leading portion of one of said arms carrying an anvil and the leading portion of the other of said arms carrying a stapling head having a staple drive passageway aligned with said anvil when said arms are in nesting relationship.

Referring now to the drawing which illustrates a preferred embodiment of the present invention, the numeral 10 generally designates the base portion of the improved stapling device, 12 the stapling head support arm, and 13 the stapling head. The base 10 comprises an elongated arm formed of a thin gauge spring steel or other suitable resilient material of arcuate transverse cross section, the concave face of the base arm 10 being upwardly directed. The forward portion of the base arm 10 is formed so as to present an upwardly directed raised surface 14 having a transversely extending clinching recess 16 formed therein to define an anvil portion. Furthermore, the anvil portion terminates in a pointed wedge 17 which may be employed as a staple remover.

The support arm 12 is of an arcuate transverse cross section having its concave face upwardly directed and having its trailing end secured to the trailing end of the base arm 10 by means of a pair of rivets 19 passing through corresponding openings formed in the base and support arms 10 and 12.

Forward of the front rivet 19 base arm 10 is bent slightly downwardly so that in normal position arms 10 and 12 diverge to provide a long throat between said arms 10 and 12. The confronting faces of arms 10 and 12 are preferably similarly shaped and of the same radius so that upon depression of support arm 12 relative to base arm 10, the arm 12 will be in nesting relationship within arm 10 thereby maintaining an accurate alignment between base 10 and staple support arm 12. Like base arm 10 support arm 12 is also preferably formed of a thin gauge mild spring steel. The steel forming arms 10 and 12 should preferably be between 0.003 and 0.1 inch in thickness, for example, 0.030 inch. The throat defined by the diverging base and stapling head arms is in excess of 5 inches.

The forward end of the support arm 12 terminates in a pair of upwardly directed ears 20 which define a bracket swingingly carrying the stapling head 13. Stapling head 13 may be of any conventional construction, such as for example as that illustrated and described in U. S. Patent No. 2,670,468, issued March 2, 1954, to Herbert W. Marano. The stapling head 13 includes a channel-shaped magazine 21, a staple retaining member 22, and a cover arm 23, magazine 21, staple retaining member 22, and cover arm 23 being assembled and hinged to the bracket ears 20 by means of a pin 24 passing through openings formed in the members 21, 22 and 23 and through openings formed in bracket ears 20. The magazine 21 carries a longitudinal guide rod 26 which engages a helical compression spring 27 and a staple pusher 28 urged forwardly by the spring 27. The forward end of magazine 21 terminates in a vertical front wall 29 and an upwardly directed lug 30 spaced rearwardly of front wall 29, the confronting faces of front wall 29 and lug 30 defining a staple driving throat. The cover arm 23 carries a depending staple drive blade 32 which is in alignment with the staple driving throat when the cover arm is in closed position, as illustrated in Figure 1 of the drawing. The pusher 28 advances the stack of staples contained in magazine 21 so that the leading staple is disposed in the staple drive throat directly below the staple drive blade 32. Spring means are provided, in the well known manner, to normally maintain the drive blade 32 in a raised position and to effect the driving of a staple by being actuated by pressing down on the cover arm 23 which causes the advance of the staple drive blade 32 and the driving of an aligned staple.

It should be noted that the pressure required to effect the advance of the drive blade 32 is less than the pressure
required to depress the support arm 12 relative to the base 10 so that depression of the stapling head 13 relative to the anvil is effected prior to the driving of the staple.

The operation of the improved stapling device described above is apparent and need not be described.

While there has been described and illustrated a preferred embodiment of the present invention, it is apparent that numerous alterations and omissions may be made without departing from the spirit thereof.

I claim:

1. An improved staple driving device comprising a pair of upper and lower normally diverging, elongated arms formed of a resilient material having their trailing ends secured to each other and having upwardly directed side borders, said arms having confronting faces of complementary configuration and being movable into substantially nesting relationship, the leading portion of said lower arm carrying an anvil and the leading portion of said upper arm carrying a stapling head having a staple drive passageway aligned with said anvil when said arms are in nesting relationship.

2. An improved staple driving device in accordance with claim 1, wherein said arms are of arcuate transverse cross section.

3. An improved staple driving device in accordance with claim 2, wherein the concave faces of said arms are upwardly directed and the leading end of the lower of said arms is provided with a flat upper face having a clinching recess formed therein.

4. An improved staple driving device in accordance with claim 1, including a bracket carried on the leading end of said upper arm, said stapling head being swingably supported by said bracket.

5. An improved staple driving device comprising a first elongated arm defining a base and having an anvil portion adjacent its forward end, said first elongated arm being provided with upwardly directed shoulders along its side edges, a second elongated arm defining a support and having its trailing end portion secured to the trailing end portion of said first elongated arm and having upwardly directed shoulders along its side edges, the leading end of said second arm being normally disposed above said first arm and said second arm being movable into a nesting position relative to said first arm and a stapling head carried on the leading end of said second arm and including a staple magazine terminating in a staple drive passageway and a drive blade movable in said passageway, said passageway being in alignment with said anvil when said second arm is depressed relative to said first arm.

6. An improved staple driving device in accordance with claim 5, wherein said first and second elongated arms are of arcuate transverse cross section and concave faces thereof being upwardly directed.

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