STAPLING MAGAZINE AND FEED MEANS FOR STAPLING MACHINES

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E. MUELLER
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INVENTOR
Erwin MUeller

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STAPLING MAGAZINE AND FEED MEANS FOR STAPLING MACHINES

This invention refers to improvements in staple driving machines for office use for joining sheets of paper. The invention relates more particularly to a staple holder and feeder mechanism, into which staples are collectively charged in the form of a strip.

One of the principal objects of the invention is to facilitate and speed up the filing operations of such machines.

Another object is to render the machine fool-proof, easier to operate and to keep in proper working order and repair, and to avoid mis-stapling.

Other objects of the present invention will become apparent in the course of the following specification.

The structural features of the stapling machine of the present invention are described hereinafter, by way of example, with reference to the accompanying drawings, wherein

Fig. 1 is a longitudinal section through the machine according to the invention;

Fig. 2 is a side elevation, showing the machine partly in section, with its staple support slide housing drawn from the staple magazine into a position ready for refill;

Fig. 3 is a plan view, showing the staple magazine and staple slide housing, partly in section;

Fig. 4 is a cross-section through the staple magazine and staple slide housing, along the line IV—IV of Fig. 1;

Fig. 5 is a section through a structurally modified machine, with a base plate redesigned for accommodating spare strips of staples;

Fig. 6 is a side elevation of the machine shown in Fig. 5, partly in section, with the staple slide housing drawn from the magazine;

Fig. 7 is a front view of the machine; and

Fig. 8 is a fragmentary plan view showing the base plate and the anvil thereon.

The stapling machine shown in Figs. 1–4 has a support or base plate 1, an anvil 1' for clinching the staples, an upright frame or bracket 2, a staple magazine 4, a staple support slide housing 6, and a staple driver 9 used in conjunction with strips of staples 11.

The staple magazine has the form of a hollow lever of rectangular cross-sectional shape (Fig. 4), which has an open front-end, with upright shoulders 17, a hooked nose 19 forwardly projecting therefrom, and bearings 14' for a grooved rearwardly projecting guide roller 14. The magazine 4 is pivoted at 3 in the bracket 2 and is resiliently supported by a spring 18.

The staple support slide housing 6, cooperatively associated with the magazine 4, comprises a U-shaped feed-trough, telescopically accommodated in the magazine 4 and adapted to be slidably ejected or expelled therefrom, as described hereinafter. A staple supporting rail 10 of inverted U-shape is enclosed in the staple support slide housing 6 with ample play therebetween, on which the staples 11 will slide on their way to the raceway of the staple driver 9. And an automatic propeller mechanism engages the magazine 4, the staple support slide housing 6 and the staples 11, so as to propel the staples and ultimately to expell, under the operator's control, the empty slide housing 6 from the magazine 4, so that it can be refilled with a fresh strip of staples.

The propeller mechanism comprises a pusher 12 in engagement with the staples 11, and travelling on the staple supporting rail 10, and a coil spring 13 under tension, extending over the guide roller 14 on the magazine 4. The ends of spring 13 are fixed to the hooked tail 16 of the pusher 12 and to a hooked dogplate 15, surrounding a spring-loaded press button 20, 22, 24 in the magazine 4. A detent 23 is formed thereunderneath for cooperation with the slide housing 6. On pushing back the refilled slide housing 6 into the magazine 4, and setting thereby spring 13 under higher tension, the detent 23 will snap into slot 23', thereby locking and retaining the slide housing 6 in the magazine 4.

It is a particularly advantageous feature of the present machine, that the only button 20 which is adapted to unlock the staple supporting slide housing 6, projects upwardly through a hole in the machine, is accessible from without (Figs. 1 and 2) and is operable by one hand alone.

By pressing down the button 20 and by disengaging the detent 23, the staple supporting slide housing 6 is free to be forcibly driven or ejected out of the magazine 4 by the coil spring 13.

According to the invention, means are provided for guiding the travel of the staple supporting slide housing 6 on its expulsion from the magazine 4; these means comprise a narrow groove 26 formed in the bottom of the magazine 4 and a knob 25 provided at the lower side of the slide housing 6, frictionally interengaging each other and acting as a brake and a stop.

The staple affixing mechanism, which is cooperatively associated with the described holder, feeder and propeller mechanisms comprises a hood or shell 5 having a handle 21 thereon, fulcrumed and pivoted at 3 in the bracket 2, a staple driver blade 9 fixed in the shell 5 and is formed with a guide slot 9' therein; a hooked nose 19 which projects from the front-end of the magazine 4, extends through the guide slot 9', thus engaging the driver blade 9, centering and limiting its movements relatively to the magazine 4 and staple support slide housing 6. A plate 7 closes the staple supporting slide housing 6 at its front-end and has a flat notch 8 at the back for guiding the driver blade 9 in its downward movements.

Means may be provided for keeping the staple supporting slide housing 6 centered relatively to the staple magazine 4, such means comprising bent flanges 7', 7" formed at the front plate 7 and laterally engaging the magazine 4, shown in Fig. 3.

Furthermore, marks 57, 58 (Figs. 7 and 8) which are visible from the front side of the machine and on its anvil, may be provided for the operator to facilitate his supervision and repair work.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described my invention, my claims are:

1. In a stapling machine, a staple magazine, a staple support slide housing slidably mounted in said staple magazine, a staple supporting rail located within said staple support slide housing and firmly connected therewith, a pusher movably mounted upon said staple sup-
a tension spring, means connecting one end of said tension spring with said pusher, a movable detent fitting into an opening formed in said staple support slide housing, push-button means pressing said detent into said opening, and means engaging said push-button means and connected with the other end of said tension spring, said staple support slide housing having a front portion engaging said pusher when the machine is devoid of staples, said tension spring being tensioned when said detent is located within said opening.

2. In a stapling machine, an elongated staple magazine having a longitudinal groove formed therein, a staple support slide housing slidably mounted in said staple magazine and having a knob fitting into said groove, a staple supporting rail located within said staple support slide housing and firmly connected therewith, a pusher movably mounted upon said staple support rail, a tension spring, means connecting one end of said tension spring with said pusher, a movable detent fitting into an opening formed in said staple support slide housing, push-button means pressing said detent into said opening, and means engaging said push-button means and connected with the other end of said tension spring, said staple support slide housing having a front portion engaging said pusher when the machine is devoid of staples, said tension spring being tensioned when said detent is located within said opening.

3. In a stapling machine, an elongated staple magazine, a staple support slide housing slidably mounted in said staple magazine and having a front plate, a staple supporting rail located within said staple support slide housing and firmly connected therewith, a pusher movably mounted upon said staple supporting rail, a tension spring, means connecting one end of said tension spring with said pusher, a movable detent fitting into an opening formed in said staple support slide housing, push-button means pressing said detent into said opening, means engaging said push-button means and connected with the other end of said tension spring, said pusher engaging said front plate when the machine is devoid of staples, said tension spring being tensioned when said detent is located within said opening, and upright shoulders connected with said staple magazine and having a projecting nose engaging said front plate when said detent is located within said opening.

4. In a stapling machine, a staple magazine, a staple support slide housing slidably mounted in said staple magazine, a staple supporting rail located within said staple support slide housing and firmly connected therewith, a pusher movably mounted upon said staple supporting rail, a tension spring, means connecting one end of said tension spring with said pusher, a guide roller engaging said tension spring intermediate its ends, bearings carrying said guide roller and connected with said staple magazine, a movable detent fitting into an opening formed in said staple support slide housing, push-button means pressing said detent into said opening, and means engaging said push-button means and connected with the other end of said tension spring, said staple support slide housing having a front portion engaging said pusher when the machine is devoid of staples, said tension spring being tensioned when said detent is located within said opening.

5. In a stapling machine, an elongated staple magazine, a bracket, a pivot carried by said bracket and supporting said staple magazine at its rear end, a handle mounted upon said pivot, a staple support slide housing slidably mounted in said staple magazine, a staple supporting rail located within said staple support slide housing and firmly connected therewith, a pusher movably mounted upon said staple supporting rail, a tension spring, means connecting one end of said tension spring with said pusher, a movable detent fitting into an opening formed in said staple support slide housing, push-button means pressing said detent into said opening and projecting through an opening formed in said handle, and means engaging said push-button means and connected with the other end of said tension spring, said staple support slide housing having a front portion engaging said pusher when the machine is devoid of staples, said tension spring being tensioned when said detent is located within said opening.

6. In a stapling machine, an elongated staple magazine, a staple support slide housing slidably mounted in said staple magazine, a staple supporting rail located within said staple support slide housing and firmly connected therewith, a pusher movably mounted upon said staple supporting rail, a tension spring, a movable detent fitting into an opening formed in said staple support slide housing, push-button means pressing said detent into said opening, means engaging said push-button means and connected with one end of said tension spring, said pusher engaging said front plate when the machine is devoid of staples, and upright shoulders connected with said staple magazine and having a projecting nose engaging said front plate when said detent is located within said opening, said pusher having a hooked tail connected to the other end of said tension spring, said hooked tail being located between said shoulders and spaced therefrom.

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