United States Patent

Perkins

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[54] FASTENER POSITIONING DEVICE

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[52] **U.S. Cl.** **227/156**, 81/3

[51] **Int. Cl.** **B25c 7/00**

[58] **Field of Search** 227/156, 136; 81/3

[56] **References Cited**

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[57] **ABSTRACT**

A device is provided to facilitate inserting the leading end of a flexible strip of collated fasteners into a narrow passageway, the latter forming a part of the feed mechanism for a high speed power actuated fastener-driving tool. One end of the device is adapted to extend into the passageway and to be positioned between adjacent fasteners at the leading end of the strip and to be substantially parallel to shanks of said fasteners. The one end of the device engages the shank of the leading fastener and moves same in a sidewise direction through the passageway.

5 Claims, 3 Drawing Figures

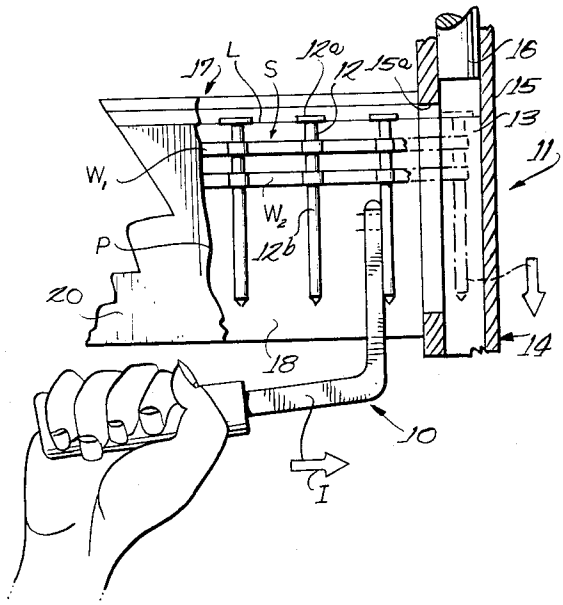


Fig. 1.

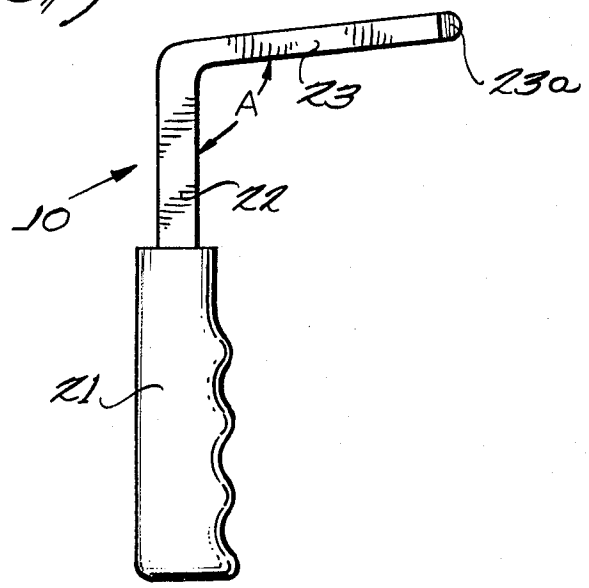


Fig. 2.

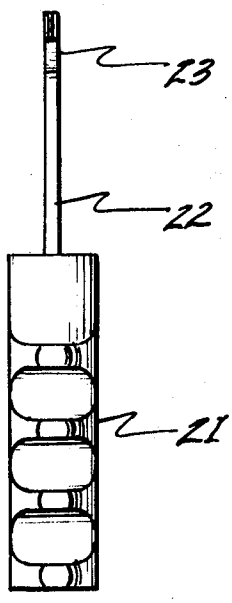
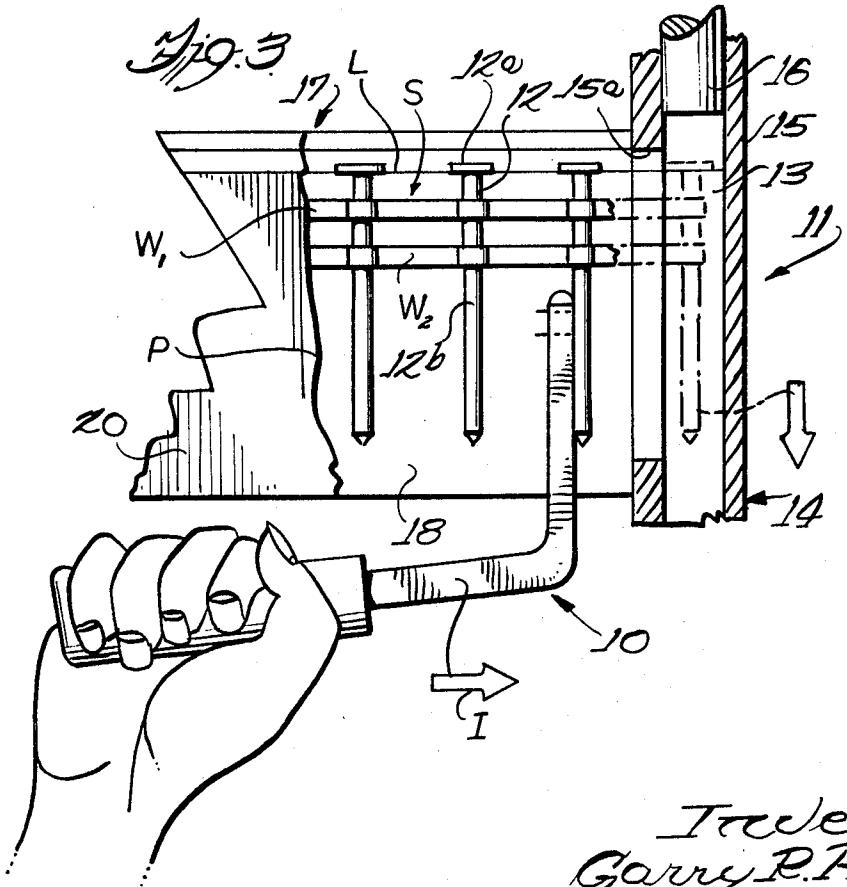


Fig. 3



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FASTENER POSITIONING DEVICE

BACKGROUND OF THE INVENTION

The loading and reloading of a high speed power actuated fastener-driving tool with a flexible strip of collated fasteners has heretofore oftentimes been an awkward, frustrating and time-consuming manipulation requiring substantial disassembly of the tool. Frequently, where the tool is affixed to a stationary frame or support, the accessibility of the feed mechanism for loading or reloading is obstructed, thereby requiring substantial dexterity and patience on the part of a person to perform the manipulation.

SUMMARY OF THE INVENTION

Thus, it is an object of this invention to provide a device which will greatly facilitate loading or reloading of a fastener-driving tool without requiring disassembly of the latter.

It is a further object of this invention to provide a device which will properly orient the shank of the fastener so that it can be automatically fed at the proper time into the firing chamber of a power actuated fastener-driving tool and thus, avoid the possibility of the fastener becoming jammed in either the feed mechanism or firing chamber.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of the invention, a device is provided to facilitate the loading or reloading of a fastener-driving tool with a continuous flexible strip of collated fasteners. The device includes a handle, an elongated first arm portion projecting from the handle, and an elongated second arm portion projecting angularly from the distal end of the first arm portion. The two arm portions define an obtuse angle. The end of the second arm portion is adapted to be inserted into a narrow passageway through which the fasteners of the strip are caused to pass while being intermittently fed into the firing chamber of the driving tool. The inserted end of the device is preferably disposed between the leading and second fasteners of the strip and is in substantially parallel relation with the shanks of said fasteners. Upon manipulation of the device, the inserted second arm portion engages the shank of the leading fastener causing same to be moved sidewise through the passageway.

DESCRIPTION

For a more complete understanding of the invention reference should be made to the drawing wherein:

FIG. 1 is a front elevational view of one form of the device.

FIG. 2 is a right side elevational view of FIG. 1.

FIG. 3 is a fragmentary vertical sectional view of a fastener-driving tool and showing the inserted second arm portion of the device in contact with the leading fastener of the flexible strip of collated fasteners; the leading fastener is shown in dotted lines when it is in position within the firing chamber.

Referring now to the drawing and more particularly to FIG. 3, the fastener positioning device **10** is shown in operative position with one form of driving tool **11** and a flexible strip S of collated fasteners **12** being fed into the tool. The tool **11** includes a firing chamber **13** formed in the nose portion **14** of the tool. The chamber **13**, in the illustrated embodiment, comprises an elongated cylinder **15** having an inlet port **15***a* formed therein and through which the leading fastener of the strip S passes when the firing chamber **13** is being charged. Slidably mounted within the cylinder interior is the driving plunger **16** which is either pneumatically, hydraulically, or electrically actuated to move the fastener disposed within the chamber downwardly and out through the lower open end of the cylinder and into the work piece, not shown.

Mounted laterally on the tool and disposed adjacent the inlet port **15***a* of cylinder **15** is the feed mechanism **17** which automatically feeds the leading fastener of the strip into the firing chamber **13** in timed sequence with movement of the plunger **16**. The fastener, when in firing position, is shown in dotted lines in FIG. 3. The firing of the tool is controlled by a finger-actuated trigger or button, not shown. The mechanism for firing the plunger and returning same to its cocked or ready position, as seen in FIG. 3, is well known in the power tool art and, therefore, is not shown or described.

The feed mechanism **17** includes a pair of guide walls **18** and **20** which are normally disposed in spaced substantially parallel relation so as to form a narrow elongated passageway P through which the individual fasteners of the strip are caused to pass as they intermittently move towards the firing chamber. The lower edge of the passageway is open. One, or both, of the guide walls are provided with a ledge L over which the enlarged head **12**a of the fastener passes while the latter moves through the passageway. Guide wall **18** is normally provided with an opening, not shown, through which a fastener-feed pawl, not shown, extends and engages the leading and/or second fasteners of the strip and automatically moves the strip forwardly so that the leading fastener will be fed into the firing chamber **13** at the appropriate time. The configuration and operation of such a pawl is well known in this art.

In loading or reloading the feed mechanism **17**, it is important that the leading fastener of the strip S be manually moved through the passageway a sufficient amount so that it is in contact with the fastener-feed pawl. It has been found, where the tool is permanently secured to a stationary support or frame, the accessibility of the passageway for loading or reloading is oftentimes obstructed, thereby requiring the exercise of a high degree of dexterity or substantial disassembly of the tool. Furthermore, because of the flexibility and the weight of the strip, particularly where it is of substantial length, handling of the strip during such loading or reloading operation oftentimes is an awkward manipulation. Thus, the device **10** is intended to facilitate such an operation.

It is important when the fasteners are fed through the passageway that the axes of the shanks **12***b* of the fasteners be properly oriented so that when they are moved into the firing chamber **13**, they will not assume a cocked or askewed position. The device **10** accomplishes the proper orientation of the fasteners in a manner to be hereinafter described.

Device **10** comprises an elongated handle **21** and an elongated thin, inflexible first arm portion **22** extending longitudinally therefrom. Extending angularly from the outer end of arm portion **22** is an elongated, thin, inflexible second arm portion **23**. Arm portions **22** and **23** may be of unitary construction and define an obtuse angle A. The size of the angle may vary depending upon the orientation of the fasteners to be engaged. In the strip S, illustrated in FIG. 3, the fasteners **12** are interconnected by a pair of narrow webs or strands W_1 and W_2, which are preferably formed of thin plastic material which is sufficiently flexible to permit the fasteners to move in a curvilinear path if required. The fasteners in strip S have the shanks **12***b* thereof disposed perpendicularly with respect to the direction of the webs which interconnect the shanks of adjacent fasteners. The webs are rupturable thereby enabling the leading fasteners to be readily severed from the webs when the tool is fired. When the strip is extended and in a taut condition, the webs will maintain the fasteners in proper spaced relation.

In some instances, the fasteners of the strip are arranged in stepped relation whereby the shanks of the fasteners are not disposed at right angles to the connecting webs. In the latter situation, the included angle A between the arm portions of the device **10** might be greater than shown.

In either situation, the arm portion **23** of the device is inserted upwardly through the passageway so that it is disposed either between the leading and second fasteners of the strip or between the second and third fasteners. The length of arm portion **23** should approximate the extent to which the shanks extend downwardly from the lower web W_2. The arm portion **23** should be narrow enough so that it will conveniently fit within the space between the adjacent fasteners. To facilitate insertion of the arm portion **23** between the fasteners, the end **23***a* of the arm portion may be rounded and the flat sides slightly tapered.

Once the arm portion **23** is in place between the adjacent fasteners, the arm portion **23** is manually moved sidewise, as indicated by arrow I in FIG. **3**, so that it engages the shank of the leading fastener and the axes of the arm portion and the fastener shank are in substantially parallel relation. Continued sidewise movement will cause the remainder of the strip to be pulled forwardly within the passageway until the leading fastener is engaged by the feed pawl, aforementioned, as being located in guide wall **18**. By the device pulling the strip through the passageway, the webs interconnecting the fasteners will become taut thereby effecting proper orienting and spacing of the fasteners, thus avoiding any jamming of the strip within the passageway or of the fasteners in the firing chamber.

The shape and size of the handle **21** and arm portions **22** and **23** may vary from that shown. The obtuse angle A, permits the handle **21** to be spaced downwardly from the bottom of the passageway and thus facilitate manual gripping of the handle.

In utilizing the device, the leading end of the strip is inserted a short distance into the infeed end of the passageway, not shown, and while held in such position, the device is inserted up from the bottom of the passageway and between adjacent fasteners and then the device is drawn longitudinally through the passageway the required amount.

Thus, when utilizing the device, the leading end of the strip may be readily moved forwardly through the passageway leading to the firing chamber of the driving tool, without requiring any disassembly of the tool, or requiring the person loading or reloading the tool to be possessed of a high degree of dexterity. In addition to moving the strip, the device properly orients the fasteners thereof so that they are in proper position for entering the firing chamber of the driving tool.

I claim:

1. A device for use in positioning a strip of collated fasteners in the feed mechanism of a power actuated fastener-driving tool, said device including a handle portion, an elongated first arm portion extending outwardly from said handle portion, and an elongated second arm portion extending angularly from the outer end of said first arm portion; said second arm portion being adapted to be inserted between successive collated fasteners adjacent the leading end of the strip and engage the shank of the forwardly disposed fastener.

2. The device of claim **1** wherein the first and second arm portions define an obtuse angle.

3. The device of claim **2** wherein said first and second arm portions are of unitary construction and said second arm portion has a rounded, flattened free end.

4. The device of claim **2** wherein said handle portion has an elongated configuration and said first arm portion extends longitudinally therefrom.

5. The device of claim **4** wherein both arm portions are of thin, narrow configuration.

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