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 [22] Filed **Aug. 22, 1968**
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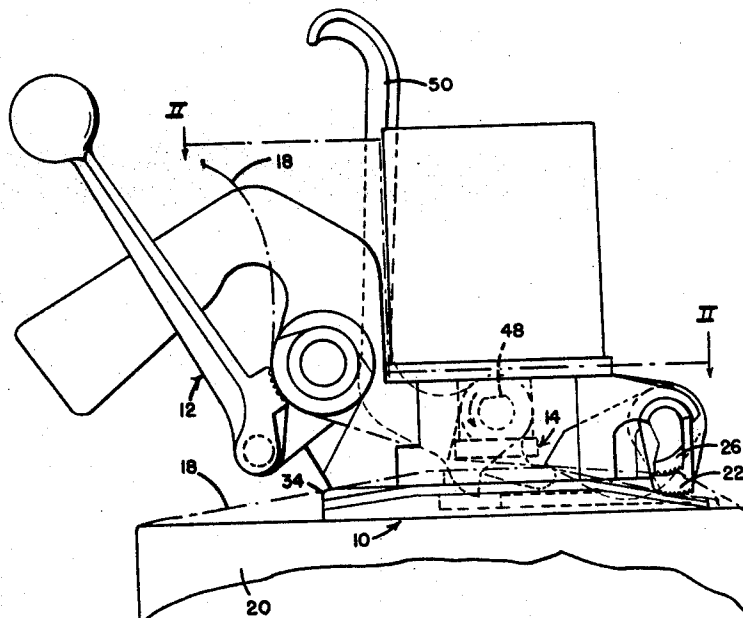
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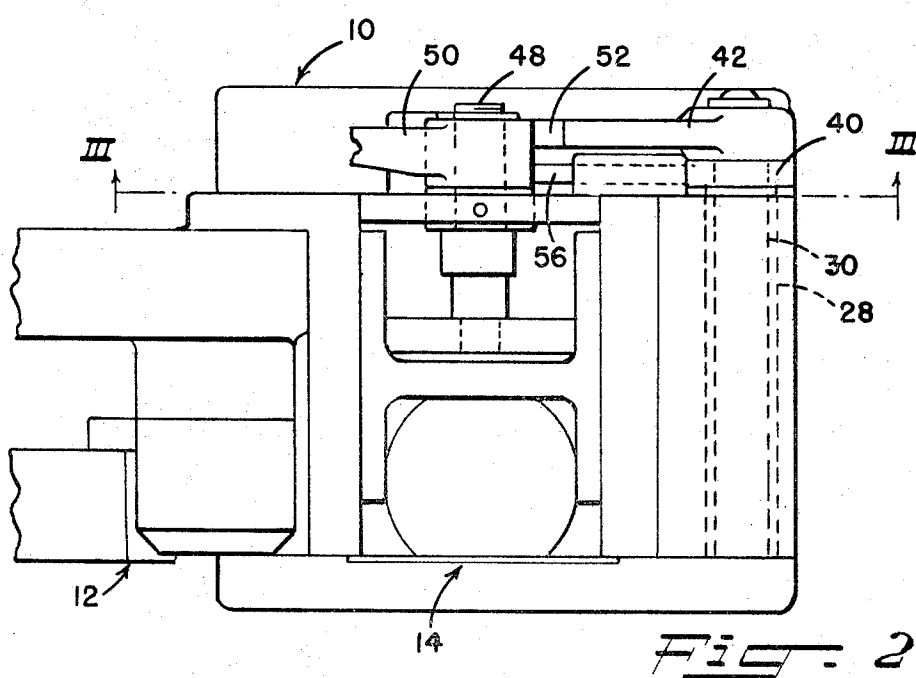
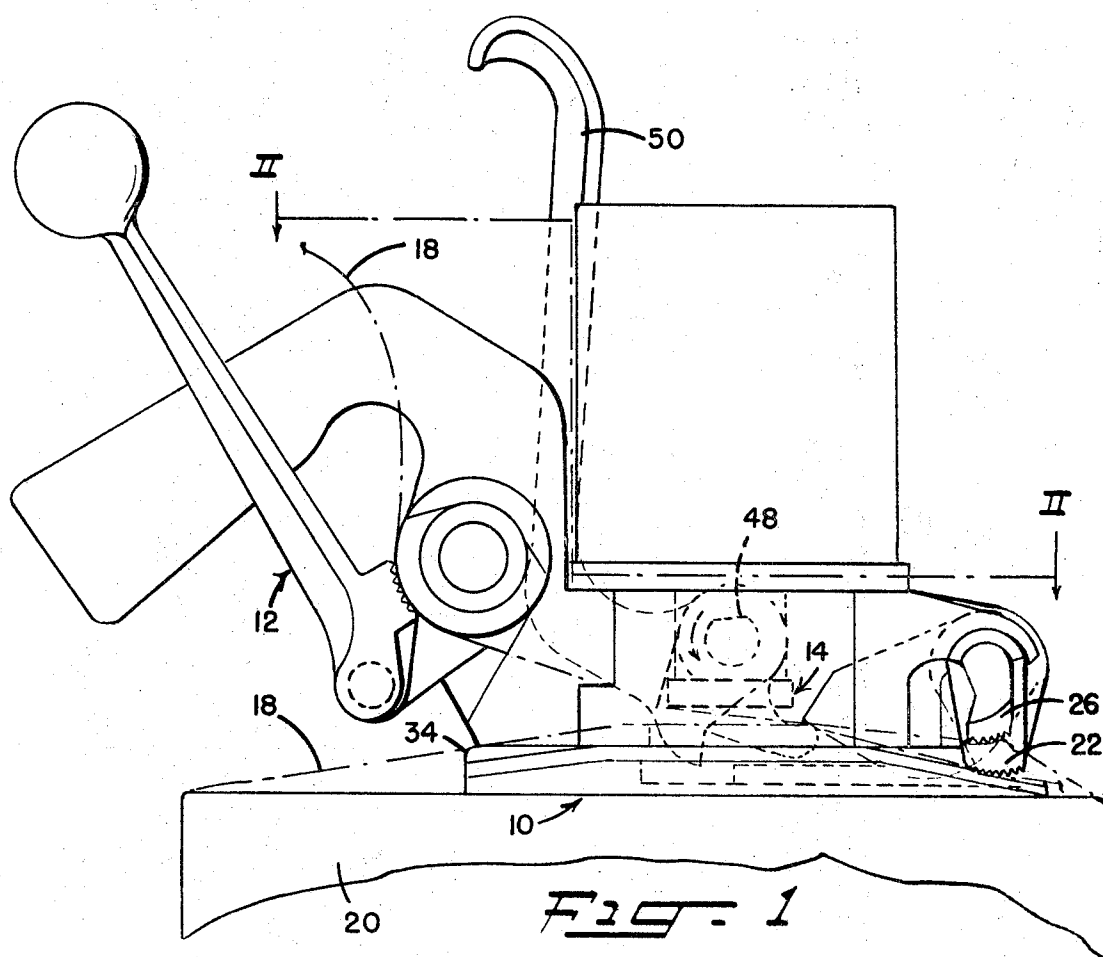
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[54] **STRAP GRIPPER FOR STRAP TENSIONING TOOL**
5 Claims, 6 Drawing Figs.

[52] **U.S. Cl.**..... **254/79**
 [51] **Int. Cl.**..... **B66f 3/00**
 [50] **Field of Search**..... **254/51, 52,**
73, 79; 100/29, 32, 212; 140/93.2; 81/3.43, 9.3

ABSTRACT: A strapping tool has a pair of strap gripping members mounted for swinging about a common axis. An end of the strapping is gripped by one of the members against a stationary foot and another portion of the strapping is gripped between the two members so that it can be pulled in tensioning direction but cannot loosen. There is a single lever for sequentially releasing the two gripping members.





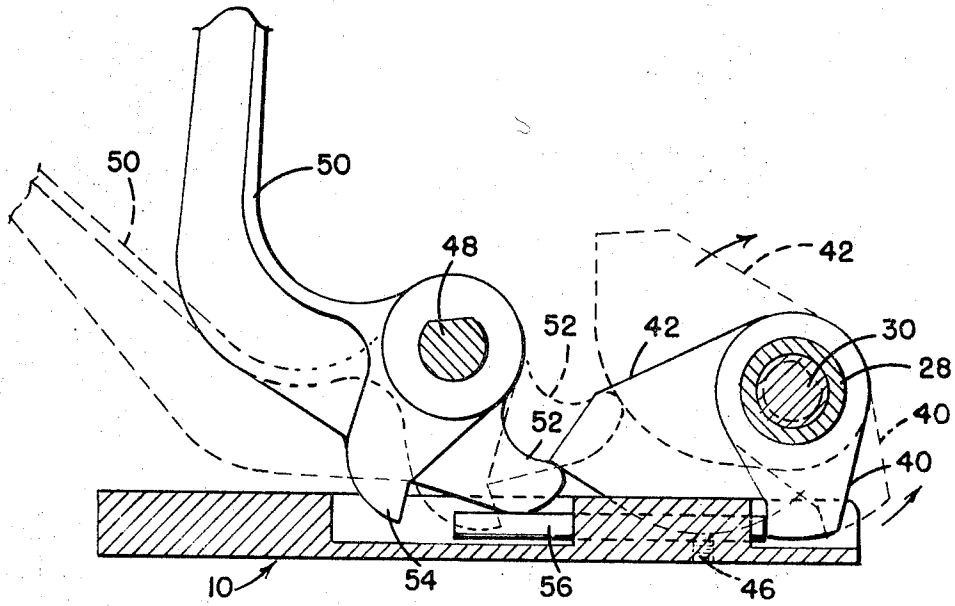


Fig. 3

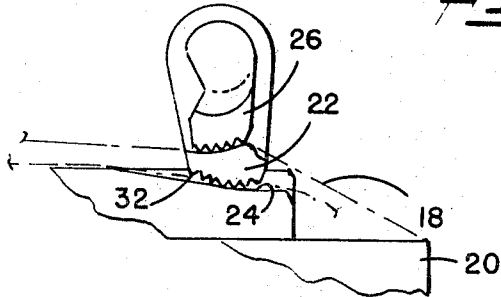


Fig. 4

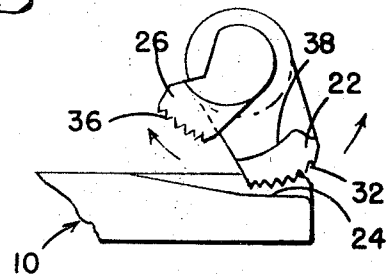


Fig. 5

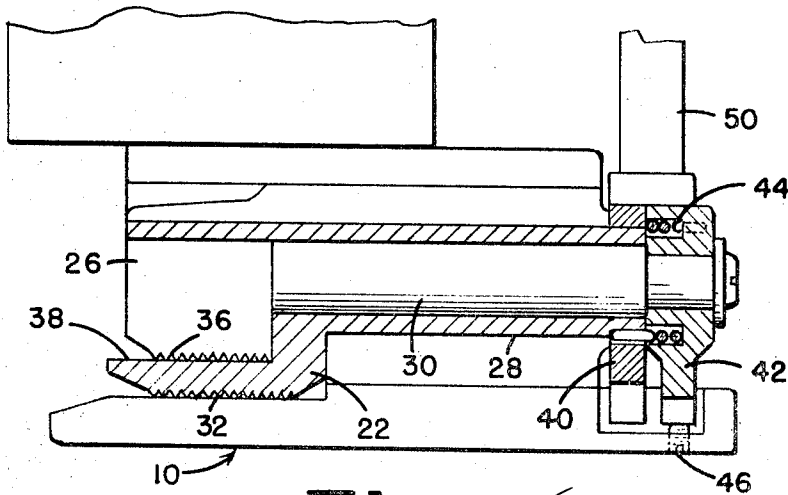


Fig. 6

STRAP GRIPPER FOR STRAP TENSIONING TOOL

This invention relates to a strapping tool, particularly to a tool for tensioning and securing a length of strapping about an object, such as a package, and, more especially, to an improved arrangement for facilitating a gradual tensioning of the strapping and for holding it under tension during the securing of overlapping portions thereof together.

In general, the type of tool to which this invention is directed comprises a gripper for holding one end of strapping and tensioning means for tightening the strapping about an object with a portion of strapping leading to a supply overlapping a portion adjacent the held end. Although not necessary to the present invention, the tool usually also comprises means for securing the overlapping portions together and means for severing the strapping looped about the object from the strapping leading to a supply. There are on the market a variety of tools for carrying out these functions. While the strapping must, of course, be held under tension about the object being strapped while the overlapping portions are secured together, it is not necessary that either or both the overlapping portions themselves be under tension and, in fact, with certain kinds of strapping and for certain types of sealing, it is necessary or at least desirable that at least the upper overlapping portion not be under tension. For example, in the case where the strapping is sealed together by a friction welding operation, the upper overlapping strap portion must be free of tension at the time of sealing and, with certain types of strapping, the upper portion should not be under tension at the time it is cut.

It is, therefore, an object of this invention to provide a strapping tool having an improved arrangement for holding the strapping under tension about the object being strapped while maintaining the upper overlapping portion free of tension during the time of cutting and/or sealing.

Other and further objects, features and advantages of the invention will become apparent as the description of a preferred embodiment thereof proceeds.

Referring now to the drawing:

FIG. 1 is a side elevational view of a strapping tool embodying the invention;

FIG. 2 is a section taken along the line II-II of FIG. 1;

FIG. 3 is a sectional view taken along the line III-III of FIG. 2;

FIG. 4 is a fragmentary side elevational view showing the strap gripping elements in gripping position;

FIG. 5 is a view similar to FIG. 4 but showing the elements in released position; and

FIG. 6 is a view partially in end elevation and partially in section and showing the strap gripping elements of the present invention.

Since the present invention may be incorporated in tools having various specific means for tensioning the strapping, for cutting it and for securing the overlapping portions together, such parts of the tool have been incompletely shown and will be only briefly referred to. The tool comprises a main frame generally indicated at 10 for supporting the various operating parts including a tensioning means indicated generally at 12 and a sealing means indicated generally at 14 for securing together overlapping portions of the strapping after the strapping, which is id indicated at 18, has been tensioned about an object such as a box partially shown at 20. The tool includes a cutter, not shown, for cutting the strapping adjacent the sealing means and between the sealing means and the tensioning means.

A gripping member 22 squeezes an end portion of the strapping against a foot 24 (see FIGS. 4 and 5) provided on the main frame so as to hold the end of the strapping against movement while it is being tensioned. A second gripping member 26, as will be explained, holds the strapping under tension about the object 20 once it has been tensioned by the tensioning means 12, but permits that portion of the strapping between it and the supply of strapping, including the upper overlapping portion aligned with the sealing means 14, to be free of tension. Thus, after the tensioning means 12 has drawn

the strapping tight, the tensioning means may be relaxed or released so that the strapping is not under tension between it and the gripping member 26 but is held under tension about the object 10.

Referring particularly to FIGS. 4, 5 and 6, both gripping members 22 and 26 are mounted for swinging movement about axes which are parallel to the foot 24. To this end member 22 includes a hollow cylindrical portion 28 which is rotatably mounted in the stationary framework of the tool and member 26 includes a solid cylindrical shank 30 rotatably mounted within the hollow cylindrical portion 28. While it is not essential that the swinging axis of member 26 thus coincides with the swinging axis of member 22, such arrangement is preferred.

Member 22 has a knurled, serrated or otherwise roughened surface 32 for engaging the upper side of the end portion of the strapping and sw squeezing it against the foot 24 when said member is swung in a first direction (clockwise as viewed in FIGS. 1, 4 and 5). The swinging axis of member 22 is located close enough to the foot 24 that said member will contact the foot when swung clockwise if no strapping is located therebetween. The roughened portion 32 is spaced a non-strap-engaging distance from foot 24 when member 22 is swung in a second direction, as shown in FIG. 4 and as will presently be explained.

From the end portion clamped between member 22 and foot 24, the strapping extends beneath the sealing means 14, over a corner 34 of the framework 10 and thence around the object 20 being strapped. After being encircled about the object, a portion of the strapping is positioned between a roughened surface 36 of member 26 and a smooth face 38 of member 22. From that point, the strapping extends beneath the sealing means 14 in overlapping relationship with the portion of the strapping adjacent foot 24 and then to the tensioning means 12 and a supply of strapping not shown. When member 26 swings in the above referred to second direction, i.e., counterclockwise as viewed in FIGS. 4 and 5, the strapping is squeezed between the roughened surface 36 of said member and the relatively smooth surface 38 of member 22. When member 26 swings in the above referred to first direction, i.e., clockwise as shown in FIG. 5, the roughened surface 36 becomes spaced a nonstrap-engaging distance from the surface 38.

Secured to the hollow shaft 38 of member 22 is a cam 40 and secured to the cylindrical shank 30 of member 26 is a cam 42. As best seen in FIG. 6, cams 40 and 42 are mounted side-by-side and a coiled spring 44 has an end secured to cam 40 and the other end secured to cam 42. Spring 44 is under some stress and urges member 22 clockwise and member 26 counterclockwise so that the roughened portion 36 of the latter normally engages the smooth portion 38 of the former. The total counterclockwise movement of member 26 is limited by contact of cam 42 with an adjustable stop 46 (see FIGS. 3 and 6). Therefore, spring 44 not only serves to normally hold the roughened portion 36 of member 26 engaged with the smooth portion 38 of member 22 but is also effective to normally hold member 22 to the FIG. 4 position.

Secured to a shaft 48 rotatably mounted in the framework 10 of the tool is an operating lever 50 having formed thereon or secured thereto adjacent the hub a nose 52 underlying and engaged with cam 42 and a nose 54 aligned with but normally spaced from one end of a pin 56 slidably mounted in the framework. The opposite end of pin 56 is aligned with cam 40. The normal inactive position of lever 50 is shown in full lines in FIG. 3 and the active position thereof is indicated in dotted lines.

When the tool is to be put to use, lever 50 is swung counterclockwise from the full line position to the dotted line position of FIG. 3. This movement first causes the nose 52 to rock cam 42 clockwise and subsequently causes nose 54 to shove pin 56 toward the right whereby the pin rocks cam 40 counterclockwise. Gripping members 22 and 26 are thus positioned as shown in FIG. 5. The movements of said gripping members

take place in sequence with member 26 moving first. An end portion of the strapping 18 is then positioned between foot 24 and the roughened portion 32 of member 22 and member 22 is permitted to swing clockwise so as to grip the strapping. This clockwise swinging of member 22 is brought about by the spring 44 when pressure on operating lever 50 is relaxed. However, lever 50 is not permitted at this time to move all the way to the full line position of FIG. 3 so therefore even with member 22 restored to the FIG. 4 position, member 26 remains in the FIG. 5 position. After the strapping is encircled about the object 20 and a portion thereof positioned between the roughened surface 36 of member 26 and the smooth surface 38 of member 22, lever 50 is further relaxed so as to permit spring 44 to swing member 26 to the FIG. 4 position whereby a portion of the strapping is gripped between the members 22 and 26. As previously mentioned, from the point where the strapping is gripped between members 22 and 26, it extends beneath the sealing means 14 and on to the tensioning means 12.

The tensioning means may be of the type generally indicated in FIG. 1, where tension is intermittently and manually applied to gradually tighten the strapping or it may be power driven so as to continuously draw the strapping tight once it has been activated. In any event, gripping member 26 is free to swing in the direction of the tensioning means to permit the strapping to slide over the relatively smooth surface 38 of member 22 during the tensioning operation. Then, when the tensioning operation is discontinued, the tension of in the strapping, due to engagement of the roughened surface 36 with the strapping, swings member 26 back to where the strapping is gripped between members 22 and 26. Thus, the strapping is held under tension about the package 20 but that portion of it between gripping members 22 and 26 and the tensioning means 12 may be relaxed.

We claim:

1. A strapping tool comprising a main frame, a strap engaging foot on said frame, a first gripping member mounted on said frame for swinging about an axis parallel to said foot, said member having a smooth face for engagement with a portion of strapping leading to a tensioning mechanism and having a roughened portion adapted to squeeze the end of a piece of strapping between it and said foot when said member is swung in a first direction, a said roughened portion being spaced a nonstrap-engaging distance from said foot when said member is swung in a second direction, a second gripping member mounted on said frame for swinging about an axis parallel to said foot, and said second member having a roughened portion adapted to squeeze the portion of strapping leading to a tensioning mechanism between it and the smooth face of said first member when said second member is swung in said second direction and to be spaced from said smooth face when said second member is swung in said second direction in said first direction.

2. The tool set forth in claim 1 wherein the said axis of said second gripping member is coincident with said axis of said first gripping member.

3. The tool set forth in claim 2 comprising resilient means urging said first gripping member in said first direction and urging said second gripping member in said second direction.

4. The tool set forth in claim 3 comprising a single lever rockable in one direction to both swing said first gripping member in said second direction and swing said second gripping member in said first direction.

5. The tool set forth in claim 4 comprising means causing rocking movement of said lever in said one direction to first move said second gripping member and then move said first gripping member.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,545,723

Dated December 8/70

Inventor(s) Philip W. Raley and Michael O. Derrickson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 1, line 61, delete "id"; line 74, "alined" should read "aligned"; Col. 2, line 17, delete "sw"; line 52, delete "pori"; line 63 delete "now"; Col. 3, line 3, delete "and" (second occurrence); line 28, delete "of"; line 35, ending paragraph "Having thus described a preferred embodiment of the invention, what is claimed is:" should be deleted; Col. 4, line 9, cancel "a" (second occurrence); line 18, delete "su"; line 18 cancel "said second swung in"

Signed and sealed this 20th day of April 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, J
Commissioner of Patent