April 25, 1961 M. H. VOLLANS 2,980,913

CLAMPING TOOL

Filed Sept. 17, 1958

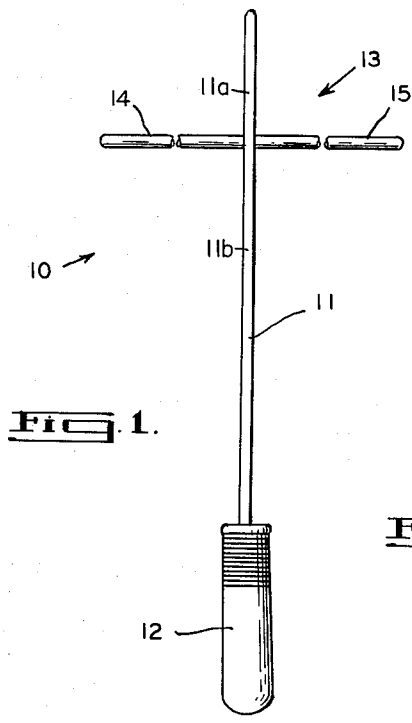

Fig. 1.

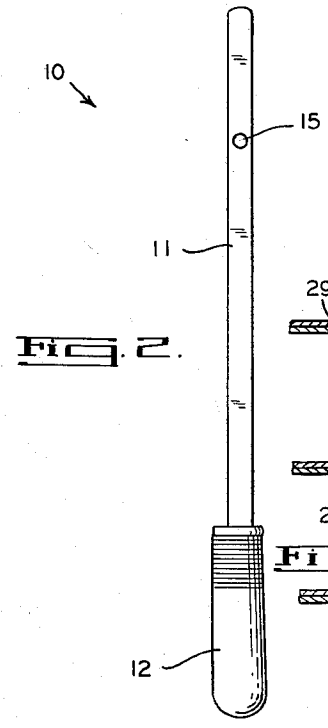

Fig. 2.

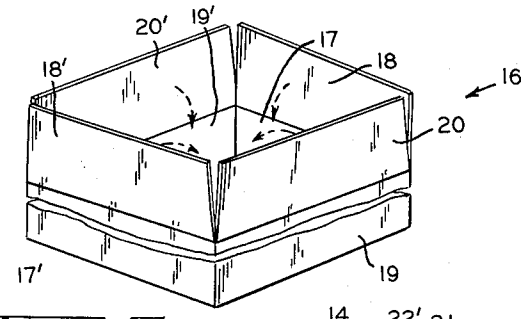

Fig. 3.

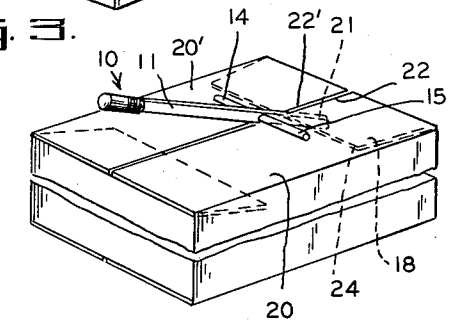

Fig. 4.

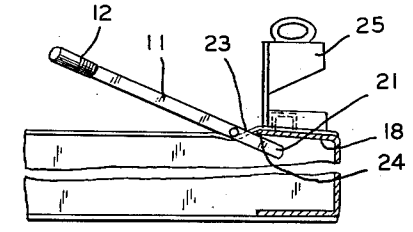

Fig. 5.

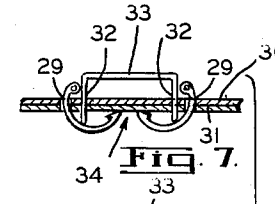

Fig. 7.

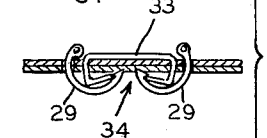

Fig. 8.

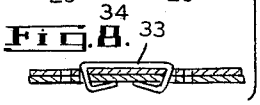

Fig. 9.

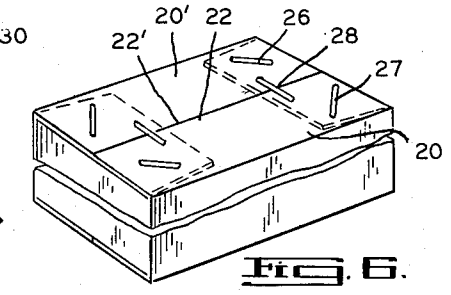

Fig. 6.

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CLAMPING TOOL

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1 Claim. (Cl. 1—260)

This invention relates to a clamping tool to be used in conjunction with a stapling machine using a large type flat staple in the fomation of a carton or container from a carton blank for the shipment of merchandise.

It will be appreciated that this invention relates particularly to the formation of cartons from blanks consisting of four integral wall portions which present opposite pairs of flaps at top and bottom which are to be folded in pairs and secured together to close the top and bottom of the carton.

In the art of packaging merchandize for shipment in cardboard cartons, it has long been standard procedure to place a carton first upon a wooden frame selected in accordance with the carton size and by folding the appended bottom flaps into contact with the wooden frame, where they are held against separation, they can be readily secured together by means of staples driven and clinched by a stapling machine placed on top of the flaps. With the bottom thus formed the carton may then receive the merchandize, the final step of packaging being the folding down of the opposite pairs of top flaps to close the top opening.

If a carton is substantially or completely full, the inner flaps are supported and will not move away under the action of the clinching fingers of the stapling machine, and therefore, the inner and outer flaps can be readily stapled together to provide a top closure which will meet with shipping regulations.

When the commodity to be packaged is yieldable or if the packaged article does not completely fill the carton, the unsupported flaps will be thrust ahead of the clinching fingers, the staple passing perhaps only through the outer flaps.

Accordingly, it has been the practice to seal all such cartons with tape, requiring the purchase of expensive equipment, the tape, and employing skilled labour to operate the equipment. This method of sealing must also meet with regulations and collectively, the cost has proved a very large item in the total cost of packaging merchandise.

While there are machines available on the market which have a piercing member to pierce the carton wall adjacent to the top and below the inner flaps to support the inner and outer flaps against separation whereupon they are then stapled together, this piercing member, leaves an opening in the carton wall which not only weakens it but gives access to the carton interior for dust and other contaminating material which clearly is not desirable.

It is therefore the principal object of this invention to provide a novel method and apparatus for holding the flaps of a closed carton end against separation and to support same against the forces exerted by a stapling machine from a position without the carton thereby obviating the standard wooden frames in sealing carton bottoms and the taping of carton tops which cannot be sealed by staples.

Another important object is to provide an apparatus

which can be easily manipulated in conjunction with the operation of the stapling machine thereby increasing productivity.

Still another object is to provide a device which when used with a stapling machine will not interfere with the stapling machine and staple pattern which must conform to shipping regulations, while it is important to provide a device which can be economically produced.

The principal feature of this invention resides in providing a holder having a thin blade portion for insertion between the abutting flap edges of the outer flaps of the top or bottom of a closed carton end, the holder having a transverse support formation spaced from the end of the blade and adapted to be supported by the outer flaps, the end of the blade being adapted to be placed below the leading edge of one inner flap at a time, and wedged upwardly against the leading edge of that flap to effect a clamping action therebetween sufficient to withstand the force of the entering staple and clinching fingers of a stapling machine over substantially the whole area of contact of the inner and outer flaps.

Another important feature of this invention resides in providing a holder as aforesaid which because of its construction and position in relation to the inner and outer flaps automatically aligns and squares up the respective flaps and walls providing a package of a regular shape suitable for stacking.

Still another feature of this invention resides in the utilization of the holder in the manner aforesaid in that upon removal of the holder from the slit or opening and after having stapled the respective flaps together, by virtue of the clamping action exerted on the flaps, there is a tendency for the abutting edges of the outer flaps to move together under the action of the clinched staples whereby the carton is substantially completely sealed.

Another feature of this invention resides in the ease of manipulation of the holder whereby there has been an increase in output over two-fold.

These and other objects and features will be appreciated on reading the following specification in conjunction with the sheet of drawings in which:

Figure 1 is a front elevational view of the flap holder constructed in accordance with this invention;

Figure 2 is a side elevational view of the flap holder of Figure 1;

Figure 3 is a perspective view, partly broken away of a carton of a type to be sealed by a stapling machine in conjunction with the holder of Figure 1;

Figure 4 is a perspective view, partly broken away of the carton of Figure 3 showing the flaps folded into carton sealing relation with the holder of Figure 1 located in operative position;

Figure 5 is a vertical mid-sectional view of one end of the carton of Figure 4 illustrating the action of the holder and stapling machine;

Figure 6 is a perspective view of the carton of Figure 4 showing the top flaps secured by staples for shipment; and

Figures 7, 8 and 9 are vertical sectional views illustrating the successive stages in the clinching of the large type flat staples in conjunction with a stapling machine.

With reference to Figures 1 and 2 of the drawings, the flap holder designated at **10** comprises a bar or blade member **11** preferably formed of steel and having sufficient width to give it adequate lateral strength having a support portion **11***a* and a lever portion **11***b* to which a handle member **12** is secured at one end.

Spaced from the outer end of the blade member **11** is a cross-bar formation **13** consisting of a pair of rods **14** and **15** which are secured as by welding to the plane of the blade member **11**, at substantially right angles.

With reference to Figures 3 and 4 of the drawings, a carton **16** is shown partly assembled, the upper edges of carton walls **17** and **17'** having appended thereto inner top flaps **18** and **18'** and carton walls **19** and **19'** having appended thereto outer top flaps **20** and **20'**.

In the usual manner in closing the end of the carton **16**, the inner top flaps **18**, **18'** are folded inwardly as designated by the arrows in Figure 3, and subsequently the outer top flaps **20**, **20'** are folded inwardly, again as designated by arrows in Figure 3.

With the inner and outer flaps so disposed in planar relation, the holder **10** is placed with its outer end **21** between the abutting edges **22** and **22'** of the outer top flaps **20** and **20'**, respectively, the edge **23** of outer end **21** under the leading edge **24** of inner top flap **18**.

As will be seen in Figure 4, the bar formation **13** of holder **10** extends transversely of the outer top flaps **20** and **20'**, stabilizing the bar or blade element **11**.

In this position, upon levering the handle member **12** downwardly, there is exerted a wedging and clamping action between the outer top flaps **20** and **20'** and inner top flap **18** clamping them together against separation. A stapling machine **25** preferably using the large type flat staples is then mounted on the clamped flap portions and operated to staple them together.

It will be appreciated that in practice the force exerted by the holder **10** in this position is sufficient to support top flaps throughout their entire extent and withstand the forces exerted by the stapling machine **25**.

With reference to Figure 6 there is shown a stapling pattern with staples **26** and **27** across the corners and a staple **28** bridging the abutting edges **22**, **22'** of the top flaps **20** and **20'**.

In Figures 7, 8 and 9 there is shown a typical clinching action of a stapling machine **25** in which clinching fingers **29** are shown piercing the outer top flap portion **30** and inner top flap portion **31** to present a curved guideway to deform the legs **32** of a staple **33**.

The successive stages of clinching the legs **32** of staple **33** under the application of force of the stapling machine **25** are illustrated in Figures 8 and 9.

In particular, it will be noted that the ends of the clinching fingers **29** are spaced as at **34** and that it will be

possible for a staple to be placed in the position of the staple **28** in Figure 6 while the outer end **21** of the blade **11** is in the position shown in Figures 4 and 5.

It will also be appreciated that by virtue of the broad flat surface of the blade element **11** extending through the slit defined by the edges **22** and **22'** of the top flaps **20** and **20'** there is an aligning action which assists in maintaining the position of the forward portion **21** in alignment with the slit or separation so that the stapling machine **25** can be readily placed in the position to drive a staple as at **26**.

It will be understood that variations or modifications in the structure of the tool may be undertaken by persons who are skilled in this art without departing from the spirit and scope of the invention defined in the appended claim.

What I claim is:

A device for positioning for stapling the flaps of a carton having a pair of folded end flaps spaced from each other in a first plane and a pair of folded side flaps substantially meeting along a line, in a second plane immediately overlying said first plane, comprising a straight inflexible blade member having a support portion and a lever portion and a cross bar centrally fixed to said blade member at right angles thereto between said portions thereof, said support portion being insertable between said side flaps along said line without causing permanent deformation thereof.

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