Nov. 15, 1932. E. C. PAGEL ET AL 1,887,732

CUTTING AND FORMING DEVICE

Filed July 7, 1930 2 Sheets-Sheet 1

Fig. 1

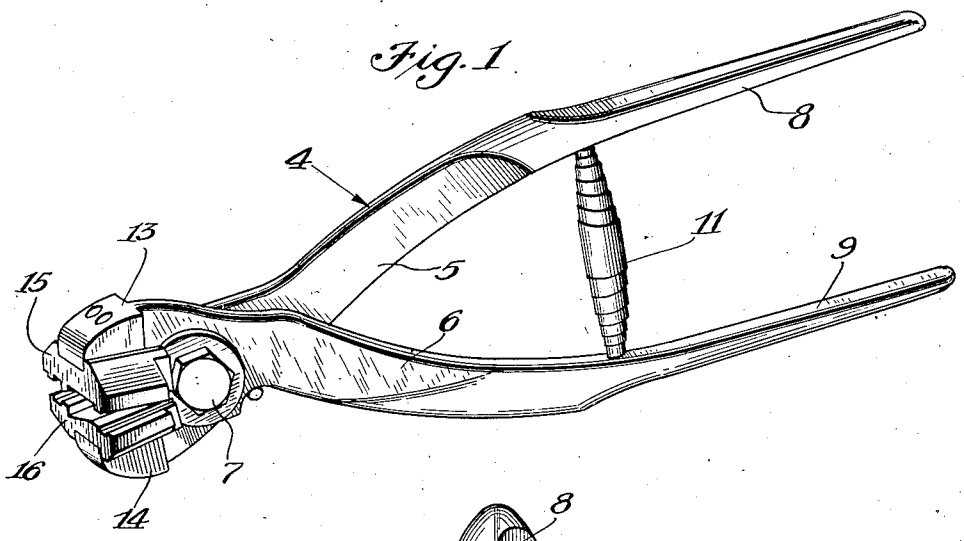


Fig. 2

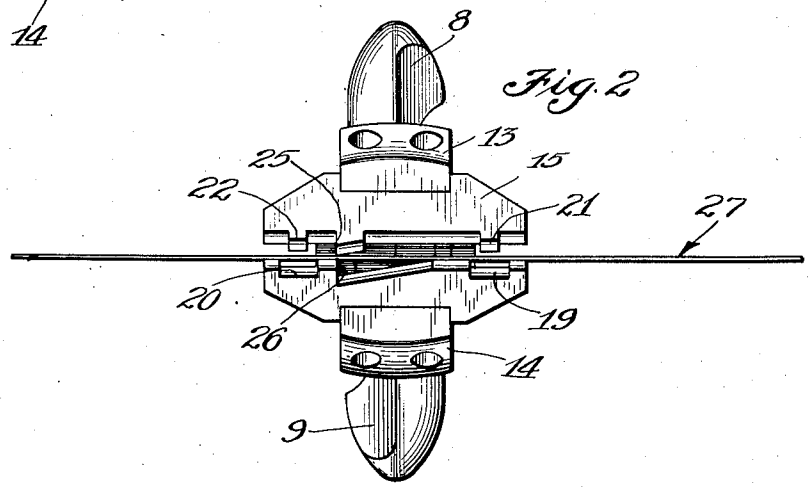
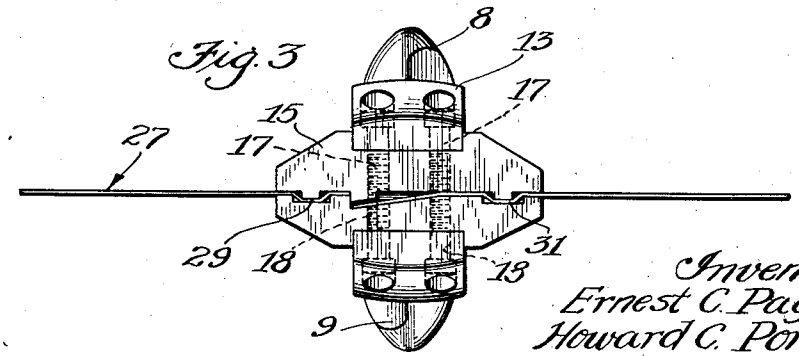


Fig. 3



Inventors:
Ernest C. Pagel
Howard C. Porter
By Williams, Bradbury, McCaleb & Hinkle.
Attys.

Nov. 15, 1932. E. C. PAGEL ET AL 1,887,732

CUTTING AND FORMING DEVICE

Filed July 7, 1930 2 Sheets-Sheet 2

Fig. 4

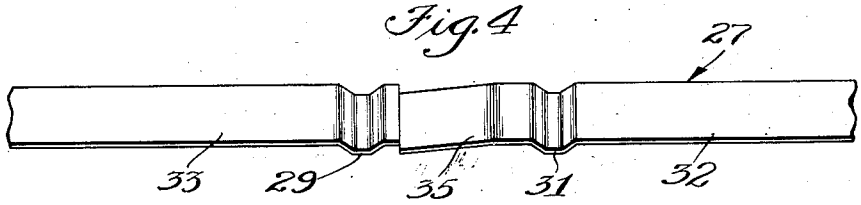


Fig. 5

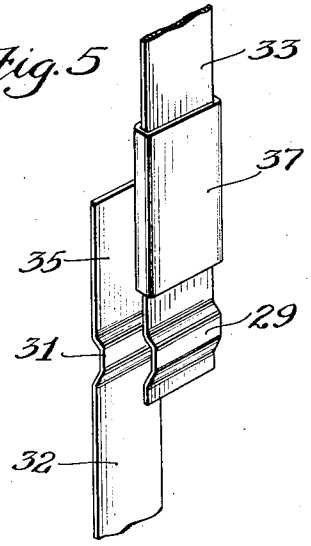


Fig. 6

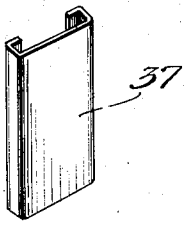


Fig. 7

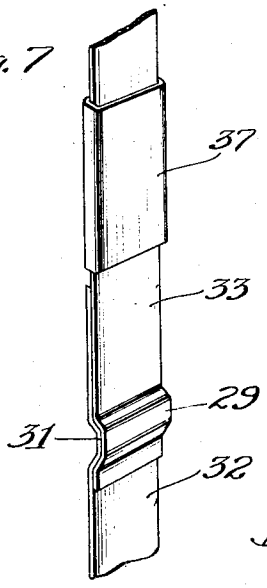
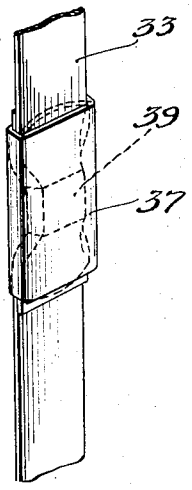


Fig. 8



Inventors:
Ernest C. Pagel
Howard C. Porter
By Williams, Bradbury, McCaleb & Hinkle.
Attys.

Patented Nov. 15, 1932 1,887,732

UNITED STATES PATENT OFFICE

ERNEST C. PAGEL, OF CHICAGO, AND HOWARD C. PORTER, OF LA GRANGE PARK, ILLINOIS, ASSIGNORS TO SIGNODE STEEL STRAPPING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

CUTTING AND FORMING DEVICE

Application filed July 7, 1930. Serial No. 466,052.

This invention relates to cutting and forming devices.

It relates more particularly to a device for simultaneously cutting and forming the severed ends of metal straps such as are employed in banding and reinforcing packages of various kinds. It will be explained as embodied in a hand tool.

In the preparation of packages, particularly those composed of elastic compressible material, it has heretofore been the common practice to encircle a package with one or more metal bands while the material is under compression, to overlap the flat ends of the band or strap and then, usually with the aid of an encircling metal sleeve, permanently to join the overlapping band ends to form in effect a hoop or loop around the package. Thus when the compression is partially or wholly released the hoop-like band or bands hold the material tightly in a package. The general appearance of a package of this kind and of a sleeved seal-joint for uniting the overlapping band ends is illustrated, for example, in Flora Patent No. 1,252,680, and Leslie Patents Nos. 1,437,525 and 1,445,330.

Considerable trouble has been experienced heretofore in the preparation or formation of such packages due in part to the difficulty of maintaining the overlapping band ends and encircling sleeve in proper relation until the band ends could be permanently joined and in part due to the difficulty of obtaining and maintaining the requisite and uniform initial tightness of the bands about the material under compression to insure substantially uniform tension when the compression is partly or wholly released and thereby produce substantially firm, symmetrical and equal-sized packages.

The foregoing difficulties have been overcome by a method of forming packages proposed by Ernest C. Pagel and which is set forth in his application Serial No. 466,053, filed July 7, 1930. The method proposed by Mr. Pagel contemplates the formation of complementary projections and depressions in the overlapping band ends which may be temporarily interengaged, preferably with the assistance of an encircling joint-reinforcing sleeve, so that the band ends of one or any number of encircling straps may be easily, quickly and accurately temporarily united and will remain so united, as long as the bands are not subjected to any substantial tension, until the permanent joint has been made therebetween.

Our invention relates to a forming and cutting device, particularly although not necessarily adapted to embodiment in a hand-operated tool, whereby encircling straps or bands of the desired length may be easily and quickly cut from a bundle or reel of band material and at the same time the two ends of the band in the region of severance are simultaneously formed to provide the complementary interengaging projections and depressions for temporarily interlocking the ends as previously set forth.

One of the objects of our invention is to provide a device for simultaneously severing and forming both severed ends of metal bands.

Another object is to provide a device which simultaneously cuts a band and forms the ends thereof, adjacent the cut, into complementary projections and depressions adapted to interengage to retain the ends together when overlapped.

Another object is to provide a device of the character described in the form of a simple, reliable, effective and easily operable hand tool.

Other objects and advantages will hereinafter appear.

In the accompanying drawings,

Fig. 1 is a perspective view of a band cutter and former incorporating our invention;

Fig. 2 is a front elevation of that shown in Fig. 1 and showing a metal strap between the jaws preparatory to being cut and corrugated;

Fig. 3 is a view similar to Fig. 2 but showing the jaws in closed position and the metal strap therein after having been operated upon;

Fig. 4 is a perspective view of the metal strap which is shown in the cutting and forming tool in Fig. 3;

Fig. 5 is a perspective view of the ends of the strap shown in Fig. 4 illustrating the manner by which they are utilized in forming a seal;

Fig. 6 is a perspective view of the sleeve used in cooperating with the corrugated strap ends to form the seal;

Fig. 7 is a view similar to Fig. 5 but illustrating the sleeve about to be threaded onto the interengaged ends of the strap; and

Fig. 8 illustrates that shown in Fig. 7 with the sleeve in the final position for holding the strap ends together, and in dotted outline is shown the sleeve after it has been marginally deformed for permanently interlocking it with the strap ends.

Referring to Figs. 1, 2 and 3, a cutting device designated as a whole by numeral 4, comprises two pivotally secured members 5 and 6 secured together by a bolt 7 intermediate their ends having substantially parallel rearwardly extending hand-grip portions 8 and 9 normally and yieldingly held apart by a spring element 11.

The forward ends of the members 5 and 6 are formed into jaw supporting elements 13 and 14, to which are removably secured relatively wide jaws 15 and 16 respectively by means of set-screws 17 and 18.

The jaw 16 is provided with similar recesses 19 and 20 adjacent the lateral edges of the jaw. On the jaw 15 are provided depending lugs or extensions 21 and 22, which are narrower than the recesses 19 and 20 and are disposed centrally thereabove in such relation thereto as to press portions of a metal strap downwardly thereinto and form corrugations in the strap as shown in Fig. 3.

Intermediate the corrugating elements 21 and 22 are provided cooperating cutting shoulders 25 and 26 which are nearer the corrugating element 22 than they are to the corrugating element 21 and are therefore adapted to sever the metal strap 27 at a point as shown in Fig. 3, which is relatively close to the corrugated portion 29 and at a greater distance from the corrugated portion 31 and resulting in the production of two strap ends 32 and 33 having the corrugated portions 29 and 31 as shown in Fig. 4 with a relatively long extending portion 35 on the portion 32 and beyond the corrugated portion 31 thereof.

The utility of the metal strap thus formed is clearly illustrated in Figs. 5 to 8 inclusive. In Fig. 6 is shown a sleeve 37 of such dimension that it may be threaded onto the end portion 33. It is threaded onto the portion 33 a sufficient distance so that the portions 33 and 32 may be lapped one upon the other in the manner shown in Fig. 7 with the complementary corrugated portions interengaged, after which the sleeve is moved downwardly to the position shown in Fig. 8 with relatively short portions of the strap ends extending therefrom, which portions are not of sufficient length to do any material damage to adjacent material. With the sleeve in the position shown in Fig. 8, it is provided with marginal deformations which cause it to be securely and permanently interlocked with the strap ends 32 and 33 forming a seal of the general shape indicated at 39.

It will be understood by those skilled in the art that other devices may be formed which will accomplish the objects of this invention and we desire, therefore, to avail ourselves of such other forms and modifications as come within the scope of the appended claims.

We claim as our invention:

1. A device of the class described comprising two relatively movable members, cooperating jaws on said members adapted to receive a metal strap therebetween, one of said jaws having recesses therein adjacent its lateral edges, projecting portions on the other jaw disposed opposite the recesses and adapted to depress portions of a strap thereinto for corrugating the same, and cooperating means on said jaws intermediate their edges for severing a metal strap positioned therebetween.

2. A cutting and forming tool comprising two cooperating jaws having forming elements thereon adapted to engage and form corrugations in a metal strap placed therebetween, and means for severing the metal strap intermediate the points at which the corrugations are formed.

3. A forming tool of the class described comprising two cooperating members pivotally secured intermediate their ends to form hand grips and jaw supports, cooperating jaws removably secured to said supports, means on said jaws for clipping a metal strip placed therebetween, and means for holding and forming complementary corrugations on the metal strip adjacent the severed ends.

4. A device of the class described comprising two relatively movable members, cooperating jaws on said members adapted to receive a metal strap therebetween, one of said jaws having recesses therein adjacent its lateral edges, projecting portions on the other jaw disposed opposite the recesses and adapted to depress portions of a strap thereinto for corrugating the same, and metal cutting means on said jaws adapted to sever the metal strap intermediate the corrugations formed therein and relatively nearer one corrugation than the other.

5. A band cutting and forming tool comprising oppositely disposed cooperating jaws adapted to receive a metal strap therebetween, and including means for forming two similar corrugations on the strap, means on said jaws for severing the strap between the corrugations and nearer to one corrugation than the other, and means for actuating the jaws.

6. A combined strap cutting and forming tool comprising two actuating elements piv-

oted together intermediate their ends, forming parallel extending handle grips and positively disposed jaw supports, removable jaws secured to said jaw supports and adapted to be actuated into cooperating relation, said jaws including means for forming spaced deformations on a metal strap placed between the jaws, and cooperating cutting portions disposed to cut the strap adjacent one of the corrugations and a spaced distance from the other corrugation, thereby providing a relatively long extension on one of the severed ends of the strap toward the end from the corrugation thereon.

7. A device of the class described comprising a pair of relatively wide jaws adapted to interengage face to face, said jaws being provided with cutting edges adapted to sever a metal strap placed between said jaws, and with die elements on either side of said cutting edges adapted to produce transverse corrugations on the strap at the same time as the cutting operation.

8. A device of the class described comprising a pair of relatively wide jaws adapted to interengage face to face, said jaws being provided with cutting edges adapted to sever a metal strap placed between said jaws, and with die elements on either side of said cutting edges adapted to produce transverse corrugations on the strap at the same time as the cutting operation, the die elements on one side being located nearer the cutting edges than the die elements on the other side.

9. A device for forming and severing metal package-binder straps, comprising a pair of relatively movable jaws having cooperating cutting means for severing the strap and cooperating deforming means flanking the cutting means on each side for forming complementary deformations in the severed ends of the strap.

In witness whereof, we hereunto subscribe our names this 1st day of July, 1930.

HOWARD C. PORTER.
ERNEST C. PAGEL.