Dec. 26, 1939. H. C. LAU 2,184,960

PACKAGE-BINDER CUTTER

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Fig. 1.

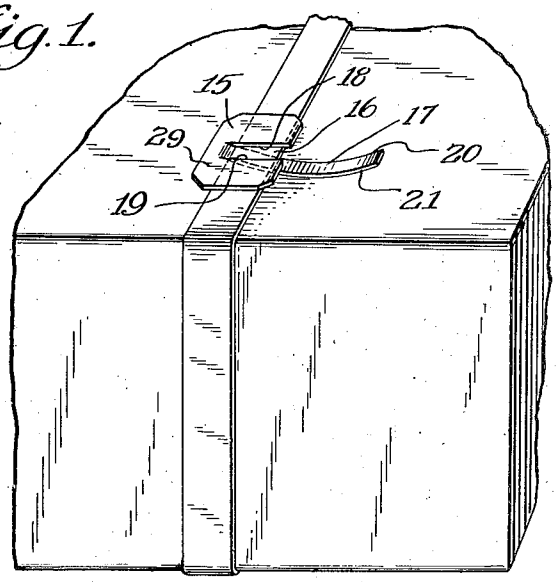


Fig. 2.

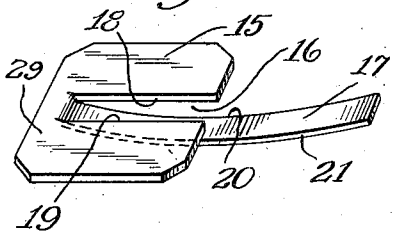


Fig. 3.

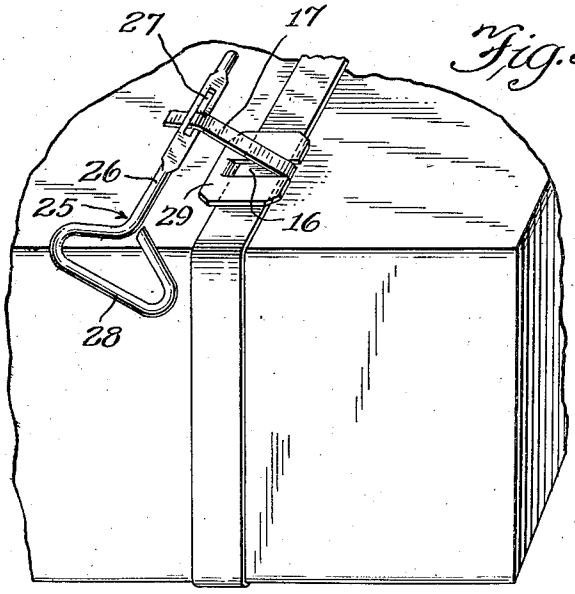
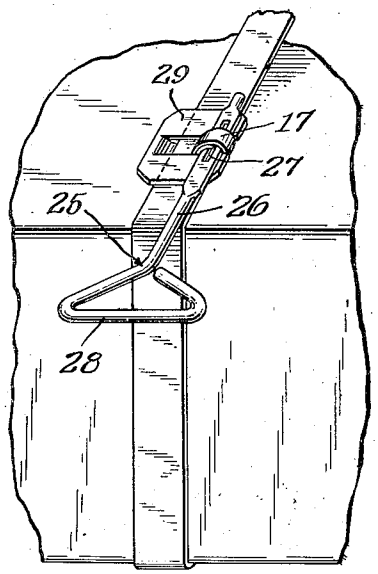


Fig. 4.



Inventor

Herbert Charles Lau.

By Williams, Bradbury,

Mc Caleb & Hinkle. Attys.

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Fig. 5.

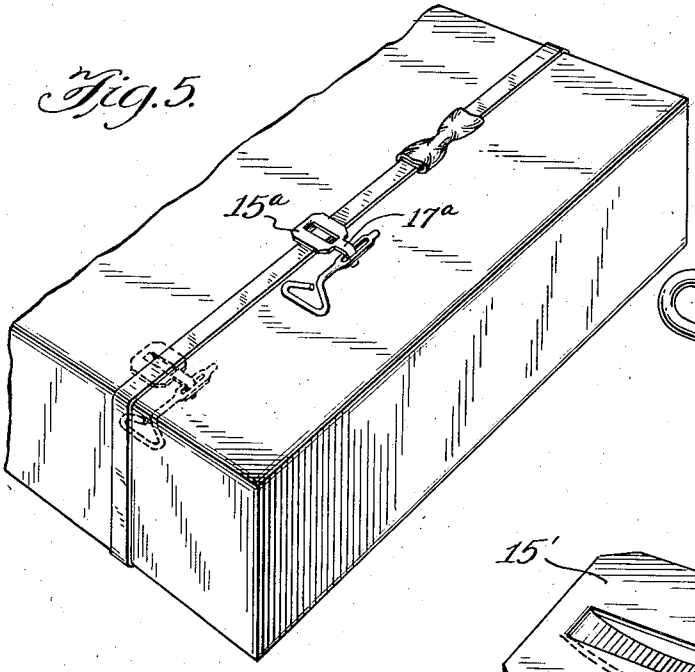


Fig. 8.

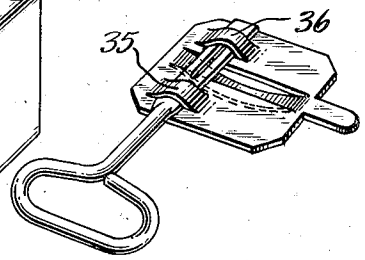
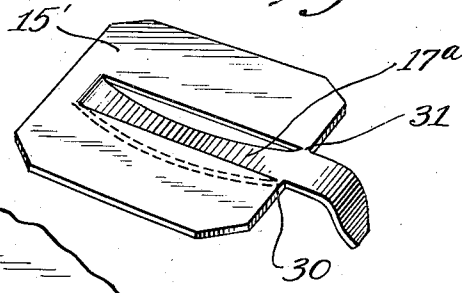


Fig. 6.



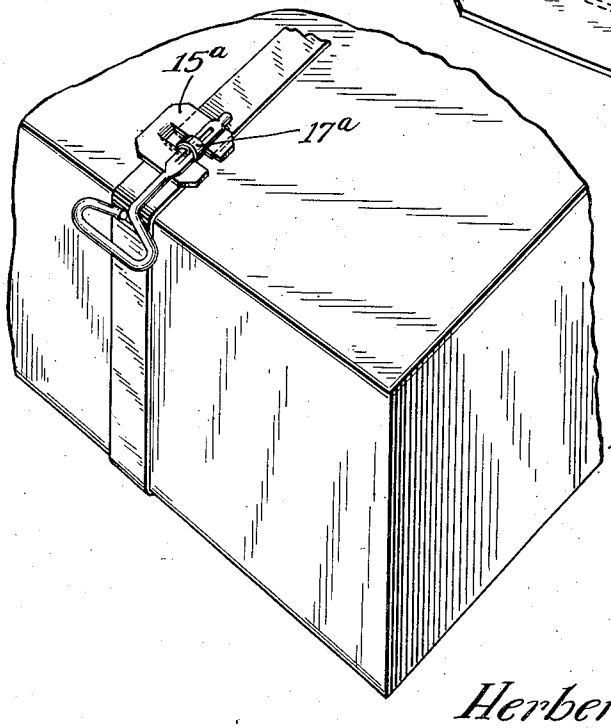


Fig. 7.

Inventor
Herbert Charles Lau.
By Williams, Bradbury
McCaleb & Hinkle. Attys.

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Fig. 9.

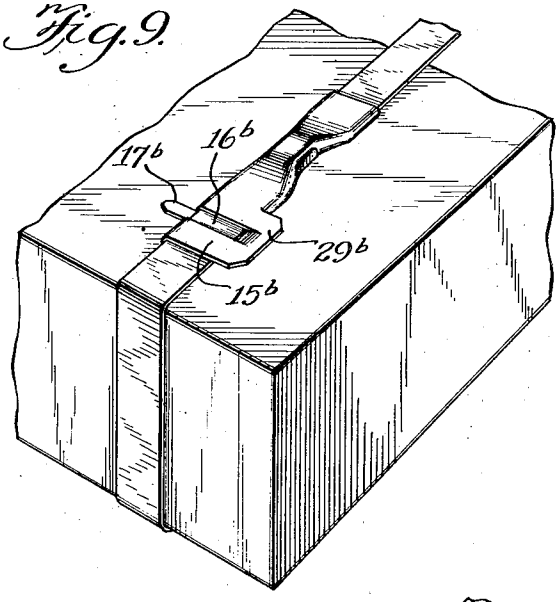


Fig. 10.

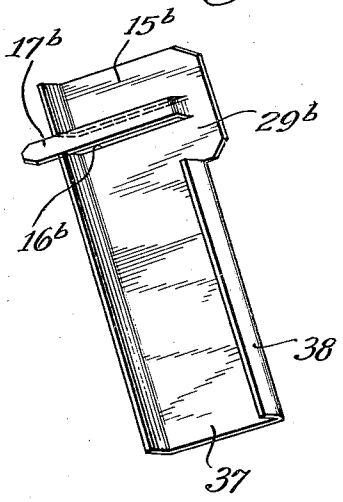


Fig. 11.

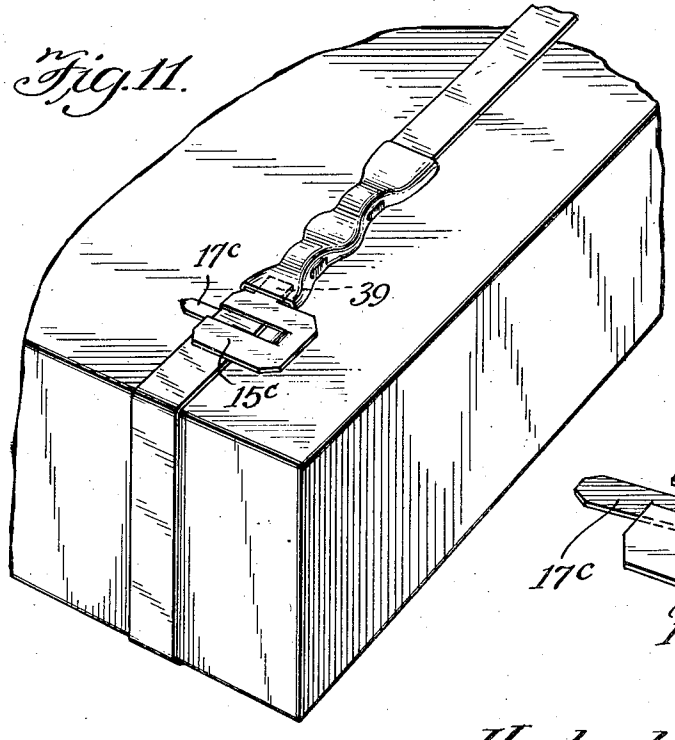
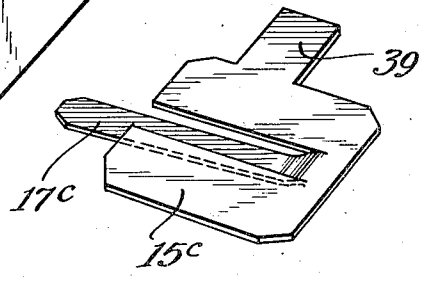


Fig. 12.



Inventor:
Herbert Charles Lau
By Williams, Bradbury
McCaleb & Hinkle. Attys.

Patented Dec. 26, 1939

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UNITED STATES PATENT OFFICE

2,184,960

PACKAGE-BINDER CUTTER

Herbert C. Lau, Oak Park, Ill., assignor to Signode Steel Strapping Company, Chicago, Ill., a corporation of Delaware

Application February 21, 1936, Serial No. 65,170

14 Claims. (Cl. 30—194)

My invention relates to package-binder cutters.

It will be illustrated and explained as applied to the cutting of binders of the flat strap or ribbon type.

For some years it has been common practice to reinforce and seal packages of various sorts and to bind together a group of packages by means of metallic binders looped and tensioned thereabout. However, the extent of this practice has been curtailed because of the difficulty encountered in removing the binder unless suitable cutting tools were available. And heretofore, such cutting tools have been rather too expensive to be universally owned and even if they were available, they often could not be quickly located when a binder was to be cut.

The principal object of my invention is to provide a binder cutter that is so inexpensive and simple that one can be furnished for each binder,—preferably accompanying the binder in or approximately in position for immediate use.

Other obects and advantages will hereinafter appear.

In general, my improved cutter comprises a plate to overlie the binder, a flexible tongue to underlie the binder, the tongue and plate having cooperating shear edges, and a key upon which the tongue may be wound to cause the shear edges of the tongue and plate to move toward and past each other to shear the binder therebetween.

Several typical embodiments of my invention are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a part of a bound package, to the binder of which is applied a cutter of the laterally positioned type,—i. e., a type which may be positioned for use at any time after the package has been bound;

Fig. 2 is an enlarged perspective of the clip of the type of cutter shown in Fig. 1;

Fig. 3 is a perspective similar to Fig. 1 showing the key of the cutter applied to the tongue of the clip preparatory to cutting the strap;

Fig. 4 is a similar view during a later stage of the operation of cutting the strap;

Fig. 5 is a perspective of a bound package, showing a type of cutter which is retained by the binder;

Fig. 6 is an enlarged perspective of the clip of a cutter such as shown in Fig. 5;

Fig. 7 is a perspective of a bound package with a clip of the Fig. 6 type during an advanced stage of the cutting operation;

Fig. 8 is a perspective of another modification in which the clip is retained by the binder and the key is retained by the clip;

Fig. 9 is a perspective of a bound package showing a cutter formed as a part of the joint reinforcing seal;

Fig. 10 is a bottom perspective of a combined joint reinforcing and cutter seal, such as shown in place in Fig. 9;

Fig. 11 is a perspective of a bound package wherein the cutter clip is formed separately from the joint reinforcing seal but is held in place by the seal; and

Fig. 12 is an enlarged perspective of the cutter clip shown in Fig. 11.

Figs. 1 to 4 illustrate probably the simplest, although perhaps not the most universally convenient, embodiment of my invention. As therein shown, the cutter comprises a clip adapted to be applied laterally to the binder and a key which may be applied to the clip and operated to cause the clip to cut the binder. The body or clip of the cutter is formed with a substantially flat top plate 15 having a slot 16 extending inwardly from one edge, and a flexible tongue 17 which registers with the slot. Tongue 17 has one end fixed or anchored relative to the plate and has its other end loose or free. Although the tongue and plate of the clip may be formed separately and appropriately attached together, I prefer to form them integrally from a single piece or blank of initially flat sheet steel. Such a blank after being cut from the sheet is slitted inwardly from one edge on substantially parallel lines to define the slot and form the tongue. The free end of the tongue should extend some distance beyond the edge of the plate so as to facilitate the placement and satisfactory anchorage of the key thereto, as will be hereinafter explained.

The clip thus formed is applied to the binder by inserting the end of the tongue under one edge of the strap and then forcing it laterally upon the strap as far as it will go, with the top plate overlying the strap and the tongue underlying the strap. In this condition the slot-defining edges 18 and 19 of the top plate, which lie along the upper surface of the strap, and the edges 20 and 21 of the tongue, which lie along the under surface of the strap, constitute two pairs of shear edges between which the strap is sheared or cut when they are forced together and past one another by the manipulation of the key, as will be hereinafter explained.

The simplest type of key 25, which may be formed from a single piece of suitably strong and

stiff wire, is such as has long been used in the opening of cans. It has a straight shank or stem **26** with a slot **27**, preferably through a slightly flattened section, near one end and a handle **28** at the opposite end. The key is applied to the clip by inserting the free end of the tongue **17** through its stem slot **27**, as shown in Fig. 3, and then the tongue is anchored to the key and the strap is cut by turning the key on its axis to wind the tongue upon its stem, as shown in Fig. 4. As the turning of the key and the winding thereon of the clip-tongue proceed through the initial stage, the stem of the key will ordinarily be drawn down against the upper surface of the clip and, for a time at least, will roll thereon in a direction transversely of the strap, being supported by the walls of the top plate along opposite sides of the slot. While the key stem thus rides upon the top plate it serves to reinforce the same and help keep the plate relatively rigid particularly during the initial and early stages of the cutting operation, notwithstanding the fact the plate may be of the same material and thickness as the tongue. As rotation is continued, the tongue of the clip is drawn upwardly through the top plate slot, thereby causing the strap to be cut by the shearing action between the adjacent shearing edges of the plate and tongue—the separated approximately tongue-width section of strap being wound on the stem along with and between layers of the tongue. Usually the cutting action will begin at the edge of the strap over which the stem of the key first begins to roll, i. e., the right-hand edge as shown in Figs. 3 and 4, and proceed progressively laterally toward the opposite edge as the rotation of the key continues. As key rotation and the cutting action proceed, the accumulation of tongue and severed strap section may become sufficient to cause the key stem to be elevated above the surface of the top plate and become supported by the coil of tongue and severed strap resting upon and rolling along the as yet unsevered strap section lying below the slot in the top plate in advance of the cut. This action, however, does not interfere with satisfactory operation. In this way the strap will be cut by a progressive or cumulative shear, acting edgewise thereof rather than flatwise across its entire width, with the result that the effort required will be at a minimum. In order to insure that the strap will be completely cut, the rear of the top plate should overhang or project beyond the edge of the strap so as to afford a supporting ledge or shelf **29** for the stem of the key (either directly or through the coil of tongue wound thereon) somewhat beyond the strap edge.

When bound packages are to be supplied with strap cutters of this variety, the convenience of those who must remove the straps will probably best be served by furnishing a clip and a key for each strap. The requisite clips and keys can, for example, be enclosed in an envelope which will accompany the package. When the receiver wishes to open the package it wil only be necessary to take the clips and keys from the envelope, apply a clip to a binder as heretofore explained (preferably close enough to one edge so that the handle of the key will lie beyond the package as clearly shown in Figs. 3 and 4) and then apply the key and rotate the same to cut the binder in the manner described,—repeating the operation for each binder.

Figs. 5 to 7 show a modified type of cutter wherein the clip and preferably also its associated key are applied to a binder at the time the binder is applied to the package. Thus, when the bound package is received, the cutter is already applied to each binder and the associated key is in proper starting position so that turning the key is all that is necessary to begin the cutting operation. Such an arrangement may generally best serve the convenience of the receivers of bound packages since there will be less liability of cutters being lost or misplaced, of the use not being appreciated or of the operation being misunderstood.

The clip of this modified cutter may, as before, be conveniently formed from a single piece or blank of sheet steel. It has the top plate **15***a* and the tongue **17***a*, the tongue being formed by slot-producing slits through the plate. Instead, however of the slits running clear to the edge of the clip top plate, to render the slot open and the tongue entirely free at one end as was the case in the embodiment just described, they terminate just inside of the edge to leave relatively weak webs **30** and **31** which tie the plate and tongue together at or near the edge of the plate. By forcing the central portion of the tongue downwardly, the tongue and top plate form a loop for encircling the binder strap, the tongue underlying and the plate overlying the strap as before. Of course, such a clip must be applied by threading it upon the binder before the ends of the binder are joined together.

The key, which is identical to the one heretofore described, may be supplied separately although I prefer that it be permanently attached to the clip by inserting the tip of the tongue through its stem slot and then welding or brazing the tongue and key together. In this manner both the clip and the key are retained by the binder and the key is properly associated with the clip tongue, ready for immediate use. When the package is being handled, the clip and key may be located anywhere along any side of the package where it will be least in the way, as illustrated by the full lines of Fig. 5. But when the binder is to be cut, the clip and key may be slid along the binder until the handle of the key lies beyond a corner of the package where its rotation will not be interfered with by the package, as illustrated by the dotted lines of Fig. 5 and the full lines of Fig. 7.

In operation, the modified cutter acts essentially as hereinbefore described. The weak webs **30** and **31**, although sufficient to insure the clip being retained upon the binder, are easily ruptured when the key is turned, enabling further rotation of the key to wind the tongue upon the stem thereof progressively to shear the binder from edge to edge in the manner previously explained.

Fig. 8 shows a modified type of clip for holding a key during handling and shipment. In addition to the slits forming the tongue and shear edges, this type of clip has two additional pairs of slits, which, when the strips of stock therebetween are bent outwardly, permit the formation of key retaining loops **35** and **36**. The stem of the key may be inserted through these loops to retain the two parts of a cutter together until the strap is to be cut. When it is desired to cut the strap it is only necessary to remove the key from the loops, insert the end of the tongue through the key stem slot and proceed with the cutting operation by rotating the key.

Figs. 9 and 10 show the cutter-clip formed as a part of or integral with a joint reinforcing sleeve such as frequently used in uniting the overlapping ends of looped package-binders. The seal

blank is lengthened somewhat beyond that required for the joint in order to provide for the formation of the cutter top plate 15b as an extension of the seal proper. This extended top plate 15b is slitted to form the transverse slot 16b and registering flexible tongue 17b. Within the region where the back member 37 of the seal becomes the shear plate of the cutter, one of the flanges 38 of the seal may be flattened out to form the overhanging ledge or shelf 29b for supporting the key stem during the final stages of the cut across the binder. Fig. 10 shows the underside of the seal before application to the overlapping strap ends and Fig. 9 shows the way the binder and seal appear after they have been deformed to produce a joint.

Figs. 11 and 12 show a cutter wherein the clip of the cutter, although formed separately from the joint seal, is held in place on the binder by the joint seal. In this form of cutter the clip is formed with a lug 39 which is adapted to be slipped between the strap and seal before the joint is made. When the strap and seal are deformed in the making of the joint, this lug is tightly gripped and held between the seal and strap, thereby holding the cutter clip securely in place with its top plate 15c overlying the strap and its flexible tongue 17c underlying the same.

Although I have chosen to illustrate the combined seal and cutter-clip arrangements with joint reinforcing seals and joints of the general type set forth in United States Patents No. 1,445,330 granted February 13, 1923, to J. W. Leslie, and No. 1,696,152 granted August 7, 1934, to H. C. Porter, it will be readily understood that this arrangement may be readily accommodated to seals and joints of other types.

Having thus illustrated and described the nature and several typical embodiments of my invention, what I claim and desire to secure by United States Letters Patent is as follows:

1. A package-binding strap cutter comprising a plate for overlying the strap, said plate having a shear edge lying transversely across the top surface of the strap when the plate overlies the strap; a flexible tongue carried by the plate for underlying the strap, said tongue having one end anchored to the plate and the other end free and having a shear edge lying transversely across the lower surface of the strap in registering relation to the shear edge of the plate; and a key having a stem to which the free end of the tongue is anchored and upon which when turned the tongue is wound, said stem, when the same is turned and the tongue is wound thereon, moving across the strap toward the anchored end of the tongue progressively to pull the shear edge of the tongue toward and past the shear edge of the plate to sever the strap therebetween.

2. A package-binder cutter comprising a clip and a key, said clip including a substantially flat slotted plate to overlie the binder and a flexible tongue registering with the slot and to underlie the binder, the edges of the slot in the plate and the edges of the tongue constituting shear edges disposed on opposite sides of the binder, and said key including a stem to which one end of the tongue is anchored and upon which the tongue may be wound when the key is turned, the winding of the tongue upon the stem of the key causing the key to travel across the binder and progressively pull the tongue through the slot, thereby cutting the strap from edge to edge by the progressive cooperation of the shearing edges of the plate and tongue.

3. In combination, a package-binder strap; a clip for application to the strap, said clip comprising a substantially flat slotted plate overlying the binder and a flexible tongue registering with the slot and underlying the binder, the edges of the plate defining the slot therein and the edges of the tongue constituting two pairs of shear edges; and a key having a stem upon which the tongue is wound when the key is turned, said stem traveling along the plate of the clip when the key is turned and the tongue is wound thereon progressively to draw the tongue to and through the slot in the plate and thereby cut the strap between the shear edges of the tongue and plate.

4. A package-binder cutter comprising a substantially flat plate adapted to overlie the binder, said plate having a slot which forms a pair of shear edges within its boundary, a flexible tongue carried by the plate in register with the slot thereof, said tongue being adapted to underlie the binder and with its edges cooperative with the shear edges of the plate to form binder cutting shears, and means for drawing the tongue through the slot in the plate to cut the binder between the shears.

5. A package-binder cutter comprising a substantially flat plate adapted to overlie the binder, said plate being slitted along substantially parallel lines lying transversely of the binder when the plate is in position thereover to define a slot through the plate and form a flexible tongue registering with the slot, said tongue being adapted to underlie the binder; and a key having a stem to which one end of the tongue is anchored and upon which, when turned, the tongue may be wound, the rotation of the key to wind the tongue thereon causing the stem to travel across the plate over the slot therethrough and progressively pull the tongue toward and through said slot to shear the binder between the edges of the tongue and the slot-defining edges of the plate.

6. A package-binding strap cutter comprising a slotted top plate for overlying the strap, said slot lying transversely of the strap to form a spaced pair of shear edges across the top surface of the strap; a flexible tongue carried by the plate, said tongue underlying the strap and registering with the slot in the top plate with one end fixed relative to the top plate and the other end free and forming a pair of shear edges for cooperation with the shear edges of the plate; and a key having a stem, said stem having a slot receiving the free end of the tongue whereby when the stem is rotated the tongue is anchored thereto and wound thereon, the rotation of the key stem and the winding thereon of the tongue causing the tongue to be progressively pulled toward and through the slot in the plate to cut the strap between the cooperative shear edges of the tongue and plate.

7. A package-binding strap cutter comprising a seal for reinforcing the joint between overlapping portions of the strap, the back member of said seal being extended to form a top plate for the cutter and said top plate having a shear edge overlying the strap and a flexible tongue with a shear edge underlying the strap; and a key having a stem to which one end of the tongue may be anchored and upon which the tongue is wound when the stem of the key is turned, the rotation of the key stem and the winding thereon of the tongue causing the shear edges of the tongue and top plate to be drawn toward and past one another to cut therebetween the interposed strap.

8. A package-binder cutter comprising a pair of cooperating shear elements lying side-by-side and spaced to permit the passage transversely therebetween of a package binder band, one of the elements being in the form of a flexible tongue with one end joined to the other element and the other end constructed and arranged to be received in the slotted stem of a key and to be wound upon the stem to bring the elements into shearing engagement with the band when the band is thus positioned.

9. A package-binder cutter comprising a substantially flat plate, a slot in the plate, one edge of the slot presenting a shear edge, a flexible tongue registering with the slot but offset therefrom for the transverse reception of a package-binder between the plate and tongue, the tongue presenting a shear edge for shearing cooperation with the shear edge of the slot when the tongue is drawn through the slot.

10. A package-binding strap cutter clip comprising a substantially flat top plate for overlying the strap and a flexible tongue for underlying the strap, said top plate and tongue having cooperating shear edges for cutting an interposed strap and said top plate and tongue being integral parts of a piece of sheet metal in which the tongue is defined by shear-like parallel slots in the top plate.

11. A package-binding strap cutter clip comprising a top plate slitted inwardly from one edge on two spaced lines, said slits defining a slot in the top plate and forming from the intervening metal of the top plate a tongue in register with the top plate slot, the tongue being offset from the plate to permit the passage of a strap beenath the top plate and above the tongue and transversely of the tongue, the edges of the slot in the top plate and the edges of the tongue constituting shear edges between which an interposed strap may be cut when the tongue is wound upon a key and by such winding pulled toward and through the slot in the top plate.

12. A clip for a package binder strap comprising a substantially flat top plate for overlying a strap; and a flexible tongue for underlying the strap the tongue being adapted for anchorage to and winding upon a key, said top plate having a slot with which the tongue registers and the edges of the top plate defining the slot thereof and the edges of the tongue constituting cooperative shear edges between which the strap is cut when the winding of the tongue upon the key draws the tongue toward and through the slot in the top plate.

13. A clip for a package binder strap comprising a substantially flat top plate for overlying a strap; a flexible tongue for underlying the strap the tongue being adapted for anchorage to and winding upon a key, said top plate having a slot with which the tongue registers and the edges of the top plate defining the slot thereof and the edges of the tongue constituting cooperative shear edges between which the strap is cut when the winding of the tongue upon the key draws the tongue toward and through the slot in the top plate; the top plate having a projection of substantially band width extending from one edge thereof and in a direction transverse to the direction of the slot and adapted for insertion between a strap and a seal used to reinforce a joint made between overlapping portions thereof.

14. A binder-strap cutter clip comprising a slotted top plate to overlie a strap; and a flexible tongue to underlie a strap in register with the slot in the top plate, said top plate and tongue being integral parts of a single piece of sheet metal, spaced slits in the top plate defining the tongue, the slits on one side of the sheet terminating short of the edge to leave a ledge overhanging the edge of the strap and on the other side of the sheet terminating short of the edge to leave weak webs between the tongue and top plate; said tongue being adapted to be anchored to and wound upon a key whereby it is drawn toward and through the slot in the top plate to cut the interposed strap between edges of the tongue and the slot-defining edges of the top plate.

HERBERT C. LAU.