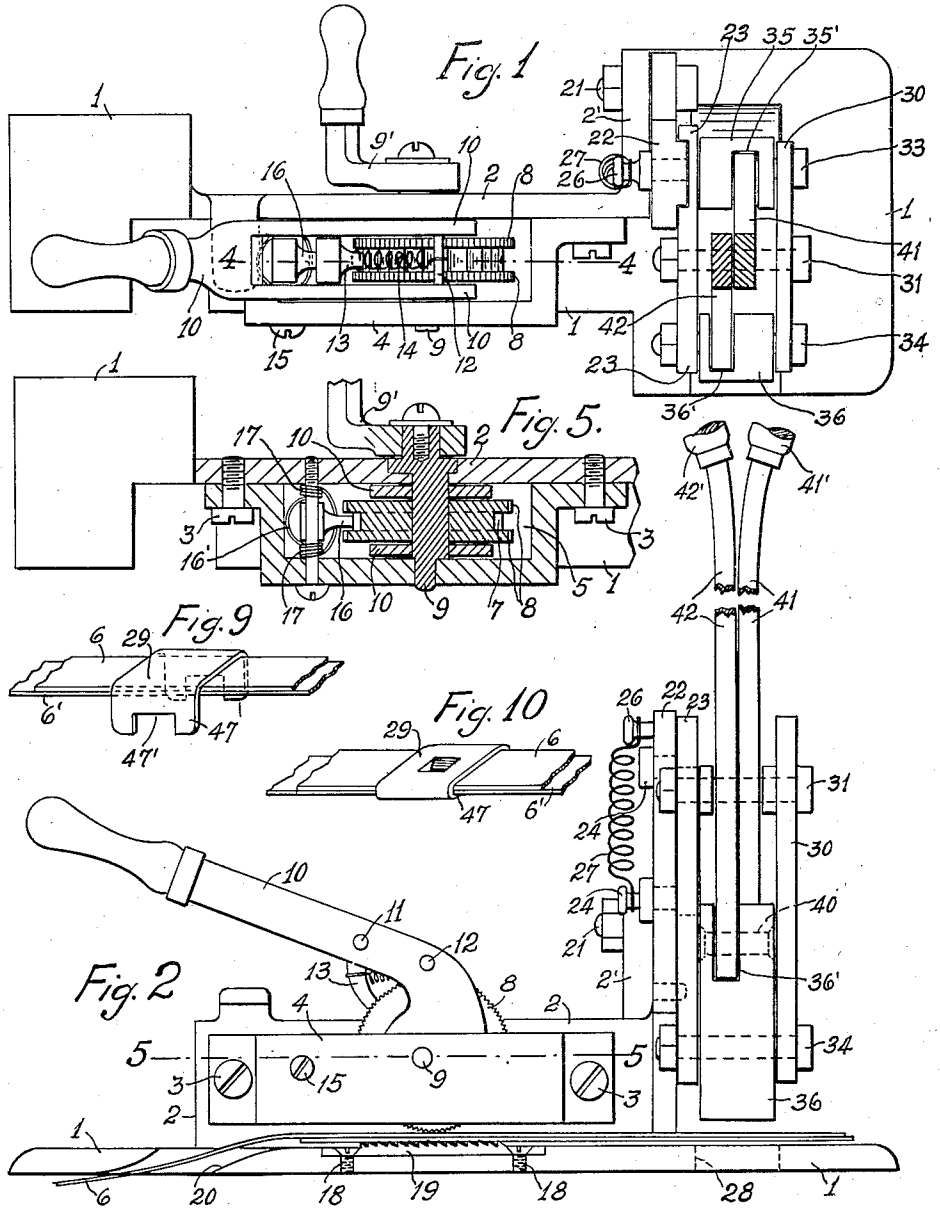
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APPARATUS FOR SEALING STRAPS

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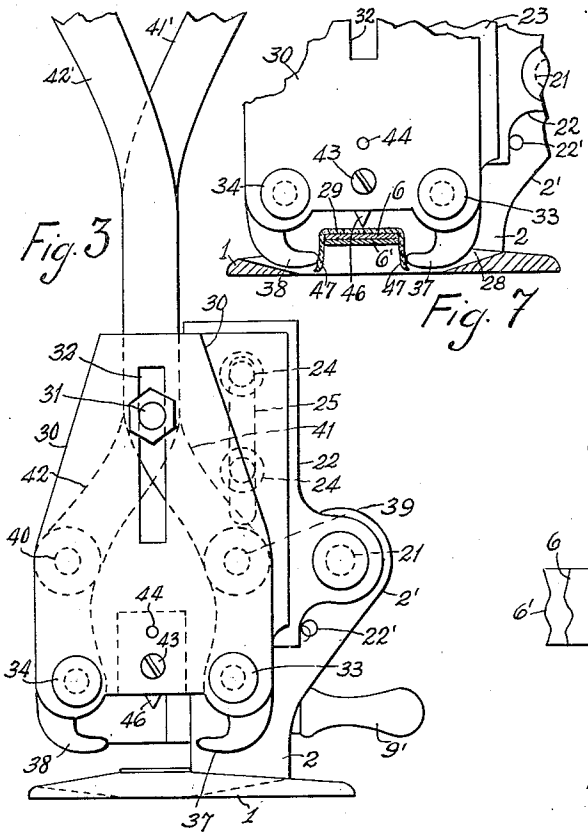


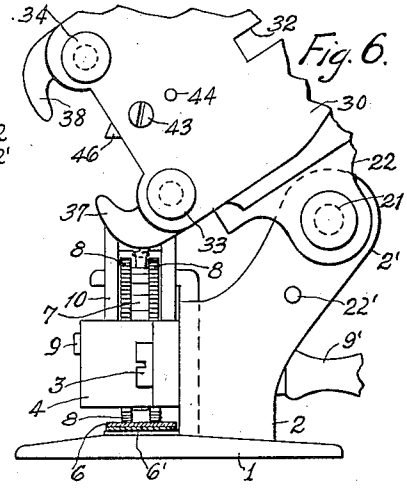
Inventor
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By B. Singer, Atty

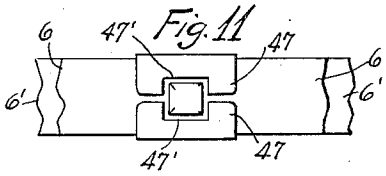
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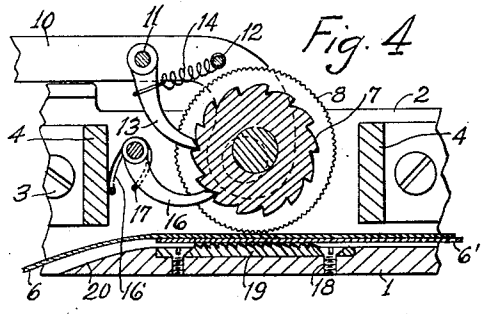
APPARATUS FOR SEALING STRAPS

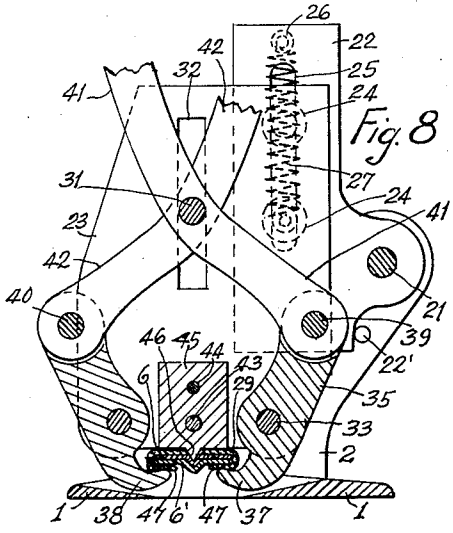
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1,886,046

UNITED STATES PATENT OFFICE

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APPARATUS FOR SEALING STRAPS

Application filed May 13, 1929, Serial No. 362,837, and in Cuba April 10, 1929.

This invention relates to apparatus for securing bands or straps around packages.

An object of the invention is to provide means in an apparatus of this type for applying the proper tension to a metallic band or strap which is looped around a package, and for maintaining this tension on the strap while a sealing sleeve is applied to overlapping parts of the strap, to press the overlapping ends with considerable force against each other and to lock them in this condition.

It is another object of the invention to enhance the locking effect of the sealing sleeve on the overlapping ends of the strap by applying pressure on a portion of the sleeve and on a portion of the overlapping ends of the strap so as to produce deformation of a portion of the sealing sleeve and of the strap.

It is, furthermore, an object of the invention to arrange means for tensioning the strap about the package and means for locking the sealing sleeve to the overlapping ends in such relation to each other that both of these means are readily accessible, and while forming a permanent part of the apparatus, do not interfere with each other when they are manipulated.

It is, furthermore, an object of the invention to provide in an apparatus of this character, to use as supporting means for the tensioning device, sealing device and strap a plate or the like which will accommodate readily straps of different width, whereby the machine may be used without any alteration for straps having a width, for instance, of one-half inch, three-fourths inch or seven-eighths of an inch respectively.

With these and numerous other objects in view, an embodiment of the invention is described in the following specification in which reference is made to the accompanying drawings.

In the drawings:

Fig. 1 is a top plan view and partly horizontal section of the apparatus;

Fig. 2 is a side elevation of the same;

Fig. 3 an end elevation viewed from the sealing mechanism of the apparatus;

Fig. 4 is a vertical sectional view on line 4—4 of Fig. 1 through the tensioning apparatus;

Fig. 5 is a horizontal sectional view on line 5—5 of Fig. 2;

Fig. 6 is a fragmentary detail end view of parts of the sealing apparatus;

Fig. 7 shows the same parts in a different position;

Fig. 8 is a sectional view through the sealing mechanism;

Fig. 9 shows perspectively overlapping portions of the strap with the sealing sleeve loosely applied thereto;

Fig. 10 is a similar perspective view of overlapping ends of a strap with the sealing sleeve in locking position, and

Fig. 11 is a bottom plan view of overlapping portions of the strap with the sealing sleeve applied thereto.

The apparatus comprises in combination a tensioning mechanism and a sealing mechanism, both of which mechanisms, however, are mounted on a common base 1 having two end plates which are united by a longitudinal narrow portion. A vertical wall 2 rises from one edge of the intermediary narrow portion of the base, this wall having an angular extension 2′ along the edge of one of the end plates of the base. A bail shaped bracket 4 is secured by means of screws 3 to the vertical wall 2 and extends substantially parallel to said wall. The cavity 5 between the vertical wall 2 and the wall of the bracket 4 serves for receiving the tensioning elements which in the embodiment shown are adapted to act on the upper end of a strap 6, the lower end portion 6′ whereof rests directly on the base 1.

The tensioning mechanism comprises as one of the principal elements a ratchet 7, Fig. 4, which is provided on both end faces with knurled discs 8 adapted to frictionally engage the upper overlapping part of the strap 6 to place said strap under tension when the discs are rotated. The ratchet 7 with the tensioning discs 8 combined therewith is rotatably supported from a pin 9 which has eccentric bearing journals in the upstanding vertical wall 2 and the bracket 4. A portion of the pin 9 projecting through the wall 2 is equipped with a handle 9′ whereby, upon a

slight rotation of this handle the tensioning discs 8, owing to the turning of the pin 9 about its eccentric journals, may be moved closer or further away from the base plate 1 to accommodate lighter or heavier strap material.

Rotation is imparted to the knurled tensioning discs 8 by means of a lever 10 operable in a plane longitudinally of the narrow portion of the base and supported on the pin 9 by means of prongs at the bifurcated end thereof. This lever, as shown in Fig. 4, carries a pin 11 from which a pawl 13 is pivotally supported, this pawl being urged into engagement with the ratchet 7 by a spring 14 which is connected with the pawl and the other end of which is anchored to a pin 12 on the lever 10. It will be seen, therefore, by reference to Fig. 4, that upon rotation of the lever 10 about the axis of the pin 9 in clockwise direction, the pawl 13 will slide over the teeth of the ratchet without imparting rotation to the latter, while upon rocking movement in the opposite direction, this rocking movement will be communicated to the ratchet.

In order to prevent the ratchet from accompanying the lever 10 in the rocking movement in clockwise direction, a holding pawl 16 is provided which is pivotally secured to a pin 15 of the bracket 4, said transverse pin 15 also serving for supporting a helical spring 17′ which acts on the pawl 16 for normally maintaining it in engagement with the ratchet. Another spring 16′ engaging the hub of the pawl 16 limits the movement which this pawl may be compelled to make during the rotation of the ratchet 7.

In order to hold the lower end 6′ of the strap in firm engagement with the base plate 1, while the tensioning discs 8 act on the upper strap a serrated plate 19 is inserted into a suitable recess witnin the base plate and secured therein by means of the screws 18.

While the tensioning mechanism described is disposed longitudinally of the base plate 1, the sealing mechanism is transversely arranged relatively to the base plate and in front of the tensioning mechanism. The vertical wall portion 2′ rising from the base plate carries a pivot 21 for maintaining the entire sealing mechanism in a position in which it can be rocked out of the way of the strap to permit the strap to be threaded through the apparatus or for bringing it into a position in which the sealing mechanism can become operative on said strap.

The carrier of the sealing mechanism is formed by a plate 22 which is pivotally secured at 21 to the upstanding angular wall portion 2′, and this plate may be rocked into the position shown in Fig. 6, or it may drop to operative position, as indicated in Fig. 3 at which position the movement of the sealing mechanism is stopped by a pin 22′ projecting from the wall 2.

A plate 23 is guided for rectilinear movement on this pivotal carrier 22, and for this purpose a pin 26 fixed to the carrier 22 is connected by a spring 27 with a pin 24 projecting from the sliding plate 23 through a slot 25 in the carrier. From Figs. 2 and 3 it will be seen that in addition to the pin 24 to which the spring 27 is anchored, another pin 24 also projects from the plate 23 through the straight slot 25 of the carrier 22, whereby said plate 23 is positively guided for rectilinear movement on the carrier 23.

Another plate 30 is fixedly connected with the sliding plate 23 by means of a plurality of bolts 31, 33 and 34. From Fig. 3 it will be seen that the bolt 31 is slidable in a straight slot 32 which extends parallel to the slot 25 of the carrier plate 22, there being a slot 32 in each one of the plates 23 and 30 for guiding the connecting bolt 31. Nuts at the ends of the bolt maintain the plates 23 and 30 in proper spaced relation to each other.

Other bolts 33 and 34 also extending through the two plates 23 and 30 near the lower edge thereof serve for connecting these plates with each other, and also serve as pivotal supports for two jaw members 35 and 36 which project from said pivot pins 33 and 34 downward beyond the lower edge of the plates 23 and 30 and are provided at their projecting ends with bending or crimping jaws 37, 38. These jaw members 35 and 36 are pivotally connected at 39 and 40 with the lower end portions of two actuating levers 41, 42 of the sealing mechanism. For the purpose of establishing this pivotal connection between the actuating levers 41, 42 and the jaw members 35, 36 respectively, said jaws are provided at their upper portions with notches 35′, 36′ into which the foot portions of the actuating levers 41, 42 may project to be connected by the pins 39 and 40 with said jaw members.

The actuating levers 41, 42 extend angularly upward from their attachments bolts 39 and 40 towards each other. At the point of intersection these levers are pivotally connected with the slidable connecting bolt 31 for the jaw plates 23 and 30.

It will also be noted by reference to Figs. 1 and 2, that the plane of operation of the actuating levers for the sealing mechanism is transverse to the plane of operation of the actuating lever 10 for the tensioning mechanism, and owing to this arrangement of having two planes of operation at right angles to each other and having the mechanisms sufficiently spaced from each other the entire operation of the machine is greatly facilitated and accelerated.

The slide plates 23 and 30 also support rigidly a block 45 which is held in position between said plates by a pin 44 and a screw

43 so as to be immovably combined with the plates. The block 45 is provided with a projecting part 46 terminating in a sharp edge, below the lowermost edge of the plates.

By reference to Fig. 8 it will be noted that the base plate 1 is provided with a depression 28′ into which the jaws 37, 38 may be lowered in order to partly embrace the strap to be sealed, the depression being adapted to receive straps of different width.

In the operation of the apparatus, the base 1 is positioned on top of the box or other package which is to be strapped thereby, and a strap 6 is looped about the package with the free end 6′ of the strap directly overlying the serrated plate 19, while the other end of the strap 6 is placed in overlapping relation to the first named end.

The strap is then placed under proper tension by up and down movement of the lever 10 which actuates the ratchet 7 and the tensioning discs 8. The tension applied to the strap in this manner is maintained owing to the provision of the pawl arrangement 13, 16 shown in Fig. 4. A sealing sleeve 29, as shown in Fig. 9, is then positioned over those overlapped portions of the strap which are located over the cavity 28′.

During this operation of tensioning the strap and placing the sleeve 29 in proper position the sealing mechanism is moved out of the way, as indicated in Fig. 6, whereby an inspection of the portions of the strap is greatly facilitated and any disalinement of the strap at this point can readily be corrected.

The sealing sleeve 29 consists of a plate of U-shaped cross-section, the depending prongs 47 of the sleeve being provided with cut-outs 47′ intermediate their length. After the sealing sleeve 29 has been positioned in the plane of the sealing mechanism on the overlapping portions of the strap, as shown in Fig. 7, the entire sealing mechanism is rocked downward about the pivot 21, transversely of the plane of operation of the tensioning mechanism, until said rocking movement is stopped by the engagement of the carrier 22 with the stop pin 22′ on the wall 2 of the base plate. The parts are then in the position shown in Fig. 3. The two actuating levers 41, 42 having handles 41′, 42′ at their outer ends are then rocked away from each other with the effect that the pins 39, 40 connecting the opposite ends with the jaw mechanism 35, 36 are also spread away from each other, while the sealing structure comprising the plates 23 and 30 is moved downward along the slot 25 in the carrier plate, in which movement they are guided by the travel of the pins 24 in the elongated slot 25. The parts then occupy the position shown in Fig. 7.

A further actuation of the levers 41, 42 causes a further spreading movement of the tops of jaw member 35, 36, and a further downward movement of the entire structure longitudinally of the carrier 22, while at the same time, the jaws 37, 38 are rocked inward with great force against the projecting prongs 47 of the sleeve 29. They deflect the prongs 47 against the lower face of the lower strap 6′ while the upper strap and sleeve are firmly pressed against the same. At the same time, furthermore, the sharp point 46 of the block 45 between the sliding plates 23 and 30 is forced downward, either depressing the sleeve where it is engaged by the point or even piercing a hole into the sleeve and forcing the adjacent wall portions of the sleeve and straps into the depression created thereby so as to produce on the opposite or lower portion of the seal a protuberance, as shown in Figs. 10 and 11.

I claim:

1. In a device of the character described a base having an upstanding transverse wall, a carrier for a sealing mechanism pivotally mounted on said wall, said sealing mechanism comprising a pair of spaced plates rectilinearly slidable on said pivoted carrier, a pair of jaws pivotally supported between said plates, and levers connected with said jaws having a common fulcrum slidable in said plates and connected with the crimping jaws.

2. In a device of the character described, the combination of a base, a vertical transverse wall rising therefrom, a sealing mechanism, said mechanism comprising a carrier plate pivoted to said wall, a plate slidably guided on said carrier, and constrained to assume a predetermined relation to said carrier, another plate in parallel fixed relation to said first named plate, jaws pivotally supported between said plates, levers extending between said plates and connected with the jaws, and means on said wall for determining the operative position of said sealing mechanism relatively to said wall and base.

3. In a device of the character described, the combination of a base having a transverse cavity therein, a vertical transverse wall rising from said base, a carrier for a sealing mechanism pivotally supported on said wall, a pair of parallel plates, one of which is guided on said carrier and constrained to move in a predetermined position relatively to said carrier, jaws pivoted between said plates, actuating levers for said jaws extending between said plates and pivoted to each other in the space confined between said plates and adapted upon actuation to move said plates relatively to the carrier, and subsequently to move said jaws relatively to each other and relatively to the cavity in the base.

In witness whereof I affix my signature.

GERARDO GARCIA RICO.