Oct. 6, 1925. 1,555,819

S. BARUCH

DEVICE FOR TIGHTENING AND FASTENING BALE BANDS

Filed May 18, 1922 2 Sheets-Sheet 1

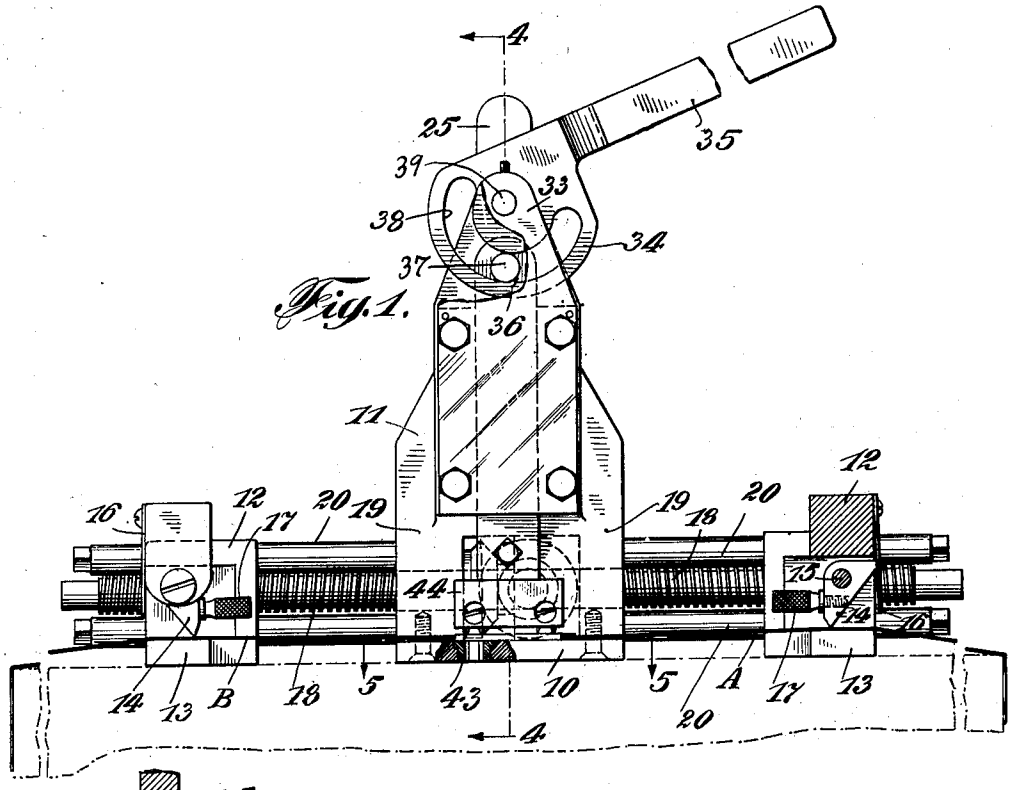


Fig. 1.

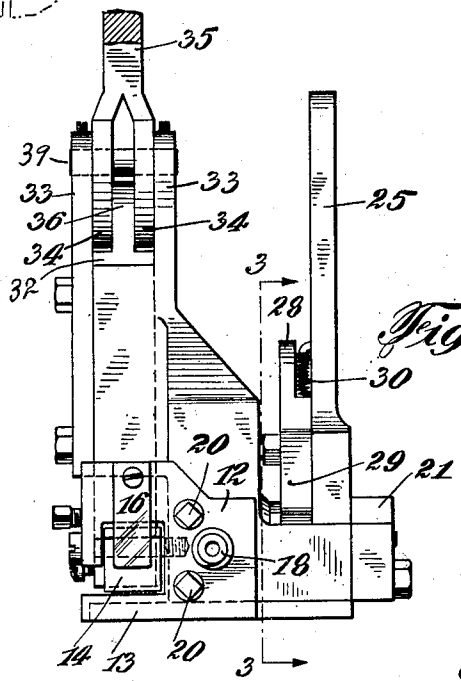


Fig. 2.

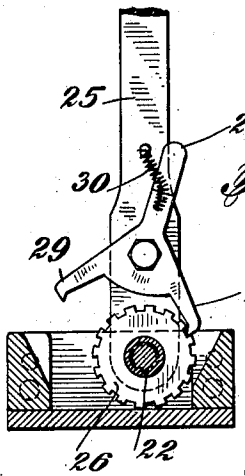


Fig. 3.

Inventor

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By Dean Fairbank Albright & Hirsh

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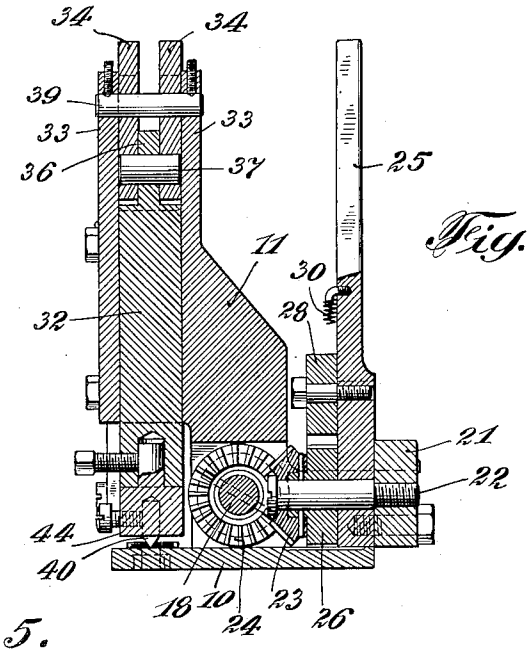


Fig. 4.

Fig. 5.

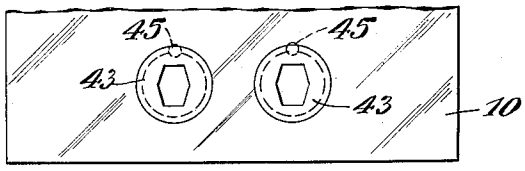


Fig. 6.

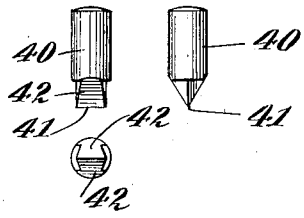


Fig. 7.

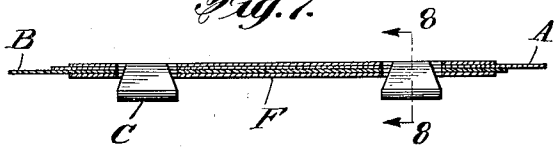


Fig. 8.

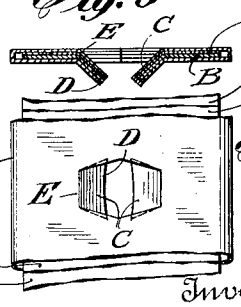
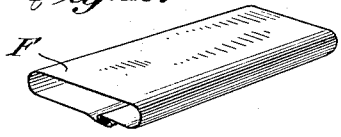


Fig. 9.

Fig. 10.



Inventor

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By Denn, Fairbank, Albright & Hirsch
His Attorneys

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UNITED STATES PATENT OFFICE.

SAMUEL BARUCH, OF NEW YORK, N. Y.

DEVICE FOR TIGHTENING AND FASTENING BALE BANDS.

Application filed May 18, 1922. Serial No. 561,991.

To all whom it may concern:

Be it known that I, SAMUEL BARUCH, a citizen of the United States, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Devices for Tightening and Fastening Bale Bands, of which the following is a specification.

This invention is an apparatus for drawing together the ends of a band, strap, or other stay-strip so as to tension the same and cause it to directly encircle a bale, box, case or other package or container, and for uniting or connecting said ends so as to hold the band in place as a binder and permit removal of the apparatus.

One of the main objects of my invention is to provide a simple apparatus of the character specified, which includes the minimum number of parts, all inexpensive and easy to manufacture and assemble, and which are not liable to get out of order, break, or fail to properly operate. A further object is to provide simple means whereby the tensioning and securing operations are accomplished by the swinging of levers or handle members in the general direction of the length of the band, and in a plane or planes at right angles to the surface of the container so that such operations do not tend to displace the apparatus or the band. A further and important object is to effectively secure together the band ends without the use of separate rivets and by such a deformation of the band structure that tension on the band tends to more effectively interlock the band ends rather than loosen the connection. Other objects and advantages will be set forth hereinafter, or will be apparent from a consideration of the details of construction of a preferred embodiment.

In the accompanying drawings:

Fig. 1 is a side elevation of a device embodying my invention.

Fig. 2 is an end view.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a plan view of the lower or stationary die member.

Fig. 6 shows three views of the movable die member.

Fig. 7 is a longitudinal section through the connected ends of the band.

Fig. 8 is a transverse section on the line 8—8 of Fig. 7.

Fig. 9 is a top plan view of the parts shown in Fig. 8, and

Fig. 10 is a perspective view of a sleeve which may be used to receive the overlapping band ends.

The apparatus illustrated includes a base 10 serving as a support for a frame 11 to which the operating parts are secured, or on which they are mounted for operation. Upon opposite sides of the main frame, and movable toward and from the same, are a pair of gripping devices for engaging with the band and drawing the ends of the latter together and in overlapping relationship above the base 10. Each of these gripping devices includes a block or body portion 12 presenting a base 13 adapted to lie beneath the band end. Pivoted to the body 12 is a gripping finger 14 so designed that its free end may engage with the upper surface of the base 13 at a point nearer to the main frame than is the pivot pin 15 of the gripping finger. Thus the strap ends A and B which overlie the bases 13, may be gripped between the lower ends of the two gripping fingers 14 and the two bases 13, and the stronger the pull on the strap end the tighter will said end be gripped or held. The frame or body portion 12 has a leaf spring 16 engaging with a portion of the gripping finger so as to hold the latter in either raised or lowered position, and each finger is provided with an extension 17 whereby it may be raised or lowered at will.

For moving the gripping devices simultaneously in opposite directions and toward and from the main frame, the latter is provided with a main shaft 18 having its center portion journaled in spaced parts 19 of the main frame, and held against longitudinal movement in respect thereto. This shaft has its opposite end portion provided with right and left hand threads having engagement with the body portions 12 of the two gripping devices. Thus upon rotation of the main shaft the two gripping devices are moved toward or from each other. To prevent any rotation of the gripping devices and around the shaft 18 as an axis, I provide suitable guides which hold the bases 13 of the gripping devices in the same plane with the base 10 of the main frame. These guides are shown in the form

of rods 20 threaded into or otherwise rigidly secured to the main frame 11, and having sliding engagement in passages in the body portions 12 of the gripping devices. These rods lie parallel to the main shaft 18. I have illustrated two such guide rods 20 for each gripping device, but it will of course be obvious that one or more may be employed.

The main frame 11 at the rear side has an extension 21 in which there is mounted a stub shaft 22 with its axis at right angles to that of the main shaft 18 and substantially parallel to the plane of the surface of the package around which the band is to be secured. This stub shaft carries a bevel pinion 23 which meshes with a bevel pinion 24 on the main shaft. The bevel pinion 24 is keyed or otherwise rigidly secured to the shaft 18, and preferably engages with one of the side portions 19 of the main frame, so that by its engagement with this side portion and with the bevel pinion 23, it serves as a means for preventing longitudinal movement of the shaft 18.

For rotating the bevel pinion 23 I provide an upstanding lever 25 which is free to oscillate on the stub shaft and adjacent to the lever and secured to the bevel pinion 23 is a ratchet wheel 26. The lever carries a pivoted member 28 having a pair of rigidly connected spaced pawl portions 29 either one of which may be brought into engagement with the ratchet wheel 26. A spring 30 connects the lever 25 and the upper end of the member 28, so as to yieldingly hold the latter in either of its two limiting positions. Thus, by oscillation of the lever, the ratchet wheel 26 may be caused to rotate in either direction, depending upon the position of the pawl member 28 and the shaft 18 may be rotated to move the gripping devices toward or from each other. It will be noted that the lever 25 is movable back and forth in a plane substantially at right angles to the surface of the container, and in the general direction of the length of the band. Therefore, this movement of the lever does not tend to displace the apparatus, and any tendency of either end of the apparatus to lift up due to pressure on the lever 25, will be resisted by the band itself, and will cause additional tension on the band.

For securing the overlapping band ends together, I provide a plunger member 32 movable vertically toward and from a portion of the base 10 underlying the overlapping band ends. For operating the plunger member the main frame has a pair of spaced, upwardly extending bracket parts 33 between which are pivoted parallel spaced portions 34 of a lever 35. Between the spaced portions 34 of the lever there is a lug or extension 36 of the plunger member 32, and this lug is provided with a transverse pin 37 extending into grooves or slots 38 eccentric in respect to the pivot pin 39 which connects the lever and the main frame. The slots or grooves are so disposed that when the lever 35 extends substantially vertically the pin 36 of the plunger member will be drawn up to its maximum elevation, and as the free end of the lever is moved over and down toward the surface of the case, the plunger member is likewise forced down in the same direction. Thus the operator applies pressure directly toward the surface of the case in operating the plunger member to deform or connect the strap ends by the dies hereinafter described. It will be noted that the lever 35 swings in a plane parallel to the plane of the lever 25, and any lifting tendency of one gripping device resulting from downward pressure on the end of the lever is resisted by the band itself, and the operation of the lever does not in any way tend to displace the apparatus.

For uniting the strap ends I provide die members which cut and bend down interlocking flange portions of such shape that they prevent any separation of the overlapping ends by longitudinal pull on the strap ends. One of the die members, preferably the one carried by the plunger member, is shown particularly in Fig. 6. It includes a body portion 40 having a cutting edge 41 for cutting a slit lengthwise of the band. The cutting edge 41 is formed between two converging faces 42 which are narrower at their upper ends than at the cutting face. The other die member, that is the one preferably carried by the base 10, has a body portion 43 in which there is formed a hexagonal aperture, the diagonal of which lengthwise of the strip to be cut, is substantially equal in length to the cutting edge 41. By cooperation of the two die members a slit is made in the two superposed band ends lengthwise of the band, and the portions of the metal on each side of this slit are bent downwardly to form two oppositely disposed flanges C, each of which is wider at its free edge D than at the angle or line of bend E. The flanges of the upper band end are forced down through the aperture of the lower band end, so as to lie directly upon the flanges of the lower band end. Due to the fact that these flanges extend in the general direction of the band, the strain resulting from pulling in opposite directions on the two band ends is in the direction of the length of the flanges. As each flange in being bent down has its wider edge brought beneath a narrower portion of the aperture from which the flange was struck out, the upper band end can not be directly lifted off the lower band end by pulling the flanges of the upper through the aperture of the lower. The flanges formed in this way interlock the two ends and provide such

resistance to the separation of the band ends by relative longitudinal movement, that in case of excessive strain the band will break before the ends will separate.

Although a single pair of dies may be employed, I preferably provide two pair arranged to interlock the band ends at two points spaced lengthwise of the band. Thus, any relative lateral sliding or twisting of the band ends is prevented.

I have shown the base 10 provided with two of the die members 43 and have shown the plunger member 32 provided with a head 44 detachably secured thereto, and having two of the die members 40 detachably secured therein so as to register with the two die members 43. The die members 43 may be locked against relative rotation in the base 10 by suitable locking pins 45.

I may rely solely upon the interlocking flanges C for holding the band ends against vertical separation as well as against longitudinal tension, but in many cases it is advisable to provide a sleeve or tube F encircling the two band ends along the section where they are to be united. This tube or sleeve may be made substantially as shown in Fig. 10 and formed of comparatively thin sheet material. The band ends may be inserted in opposite ends of a sleeve and lie in overlapping relationship within the latter. Upon operation of the dies the upper and lower surface of the sleeve will be deformed or provided with apertures and flanges in the same way as the two band ends. The sleeve alone will prevent any relative movement of the band ends except a longitudinal one, and such longitudinal movement is positively prevented by the flanges of the upper wall of the sleeve, and the flanges of the two band ends projecting downwardly through the apertures in the band ends and the lower wall of the sleeve. The three parts are thus so interlocked that separation is impossible except by breaking.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. An apparatus for tightening stay strips, including a rotatable shaft having right and left hand threaded portions, means for rotating said shaft, and a pair of gripping devices engaging with said threaded portions, each gripping device including a body portion having a base adapted to support the stay strip, a pivoted member having portions extending in directions at right angles to each other from the pivotal support of said member, one of said portions having an edge adapted to engage with the stay strip, and the other of said portions also having an edge and a leaf spring acting against said last mentioned edge, and in a direction substantially radial to the pivotal center of said member, whereby said member may be held in operative or inoperative position by said spring.

2. An apparatus for tightening stay strips, including a pair of gripping devices, and means for operating them toward or from each other, each of said devices having a base portion adapted to support the stay strip, a gripping finger pivoted thereto and having a portion extending in a direction substantially at right angles to the general direction of said finger, and a spring acting against said portion substantially radially of the pivotal center of said finger, whereby said spring acts to hold said finger in operative or inoperative position.

Signed at New York in the county of New York and State of New York this 15th day of May A. D. 1922.

SAMUEL BARUCH.