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APPARATUS FOR SECURING TOGETHER THE ENDS OF METAL OR THE LIKE BANDS

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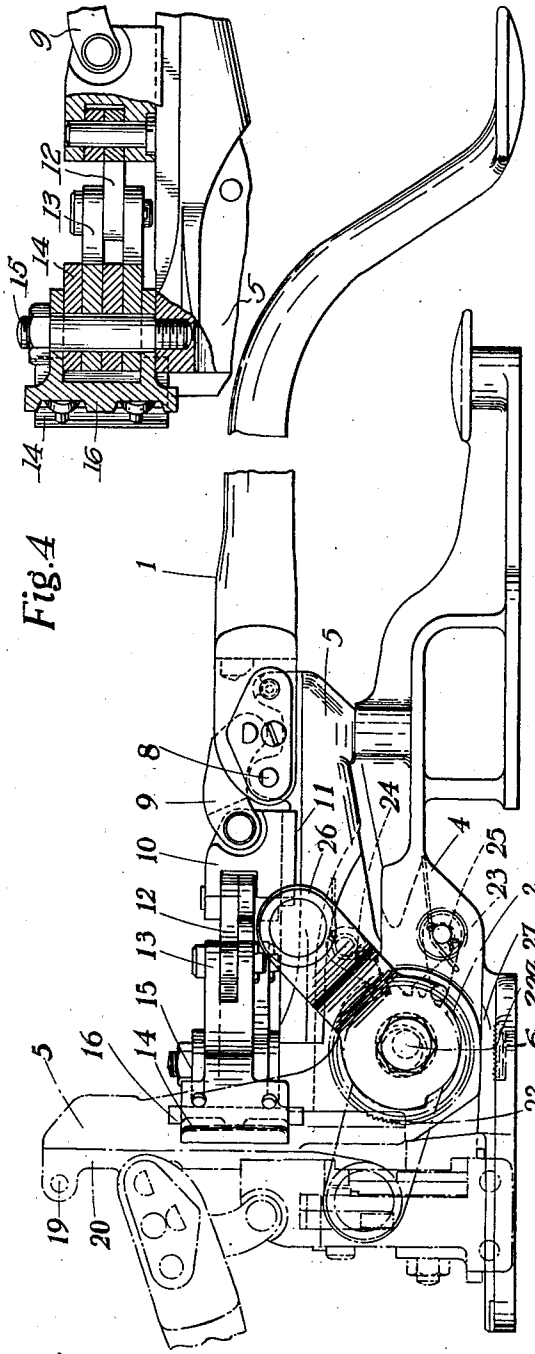


Fig. 1

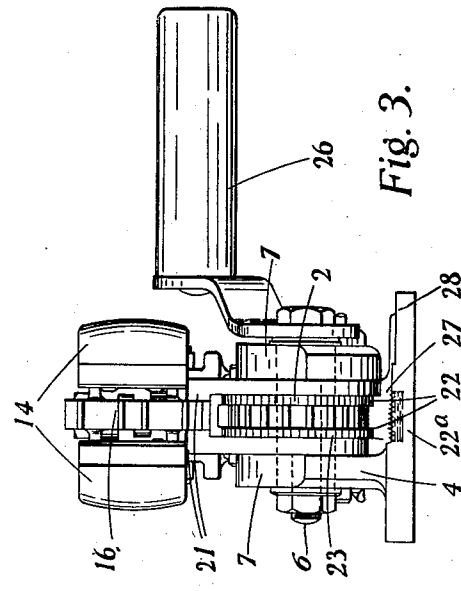


Fig. 2

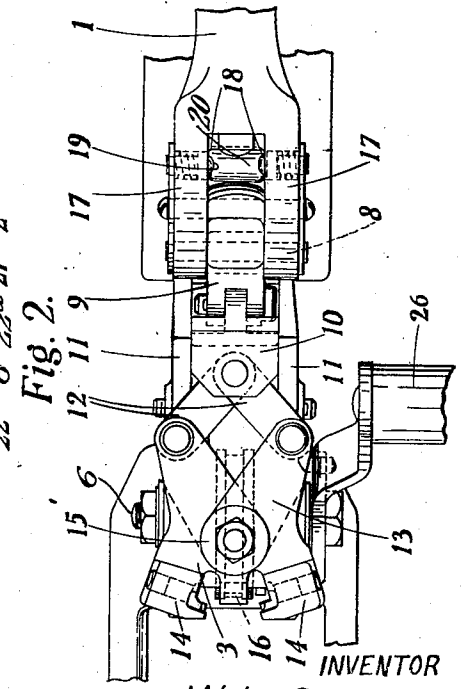


Fig. 3

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APPARATUS FOR SECURING TOGETHER
THE ENDS OF METAL OR THE LIKE
BANDS

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4 Claims. (Cl. 31-9.1)

The present invention relates to apparatus for interconnecting or securing together the ends of metal or the like bands such as are frequently employed for binding boxes, bales and other packages and has for its chief object to provide an improved apparatus so constructed as to facilitate the interconnecting or securing operation.

One well known type of interconnection or joint includes a metal sleeve or seal which initially partially encircles overlapped portions of the tensioned band and is subsequently wrapped more or less tightly and completely about and deformed with the overlapped band portions. Under some conditions and with some types of tools, such as one which combines the band stretching or tensioning and deforming mechanism, the positioning of the seal in proper relation upon the band and to the deforming mechanism is a matter of some difficulty.

One of the objects of this invention is to provide an improved apparatus whereby this difficulty is overcome.

Another object is to provide a tool to which a seal may be quickly and easily applied and then automatically placed in proper relation to the band and deforming mechanism when the latter is brought into action at the completion of the stretching or tensioning operation.

Another object is to provide a tool which is simple and yet effectively performs the two functions of positioning the seal upon the band and then deforming simultaneously the sleeve and band to effect the interconnection.

Another object is to provide, in conjunction with the deforming mechanism, a seal positioning device which will accommodate seals varying considerably in size.

Other objects and advantages will hereinafter appear.

In order that the invention may be more easily understood and readily carried into effect reference may now be had to the accompanying drawing which illustrates by way of example one form of apparatus constructed in accordance with the invention.

In the accompanying drawing:—

Fig. 1 is an elevational view of the apparatus; Fig. 2 is a partial plan view to an enlarged scale of the apparatus shown in Fig. 1;

Fig. 3 is a front elevational view of the apparatus shown in Fig. 2;

Fig. 4 is a section through the deforming or sealing mechanism showing the mounting of the deforming jaws and seal holding and positioning

anvil.

The apparatus shown in the drawing is of the type in which a single handle or lever 1 is employed for operating means designated generally by the reference numeral 2 for stretching or tensioning a metal band about a package and also for operating means designated generally by the reference numeral 3 for sealing or securing together the overlapped ends of the band after the band has been drawn sufficiently tightly about said package.

As illustrated the apparatus comprises a frame 4 upon which is pivotally mounted a head 5 which carries the handle or lever 1 and the means 3 for sealing or securing together the ends of the band or bands. The head 5 is pivotally mounted on a shaft 6 journaled in the spaced portions 7 of the frame 4 between which the head 5 is located.

The handle or lever 1 is pivoted to the head 5 at 8 and is connected by suitable linkage—such as 9—with an element 10 adapted to slide on suitable ways 11 on the head 5 the element 10 being connected by links 12 with the ends of the arms 13 of jaws 14 pivoted together and to the head 5 at 15. With this arrangement by moving the handle 1 about its pivot 8 in an anticlockwise direction as viewed in Fig. 1 the jaws 14 may be caused to move together to exert in the apparatus illustrated an edgewise crimping action on the overlapped ends of a metal band or bands placed between them and thereby secure or seal said ends together, the jaws being suitably shaped or formed for this purpose. Moreover owing to the system of linkage employed between the handle and the jaws the power applied to the handle is considerably augmented or multiplied.

Associated with the jaws 14 there is provided means for holding a sleeve in such a position with respect to the jaws 14 that when the head 5 is moved to bring the jaws into operative relation to the overlapped ends of the band or bands the sleeve is simultaneously positioned about said ends and there held during the subsequent sealing or securing operation. As shown such means consists of a magnetized member or anvil 16 supported in position between the jaws by the pivot 15 so that it may also cooperate with the jaws in the production of the joint creating deformation.

To enable the handle 1 to be employed to rock or oscillate the head 5 about the shaft 6 for the purpose of operating band tensioning means 2 it is detachably connected to the head. For this purpose in the embodiment of the invention illustrated the lever 1 is bifurcated at 17 and is provided with resiliently mounted studs

18 adapted to engage in suitable recesses 19 formed upon a projection 20 of head 5 which projection lies between the bifurcations 17 of the handle 1 when it is in the position shown in Figure 1.

In the region of its pivotal mounting on the shaft 6 the head 5 is recessed as shown at 21 and within the recess there is mounted the means 2 for stretching the metal band. As shown such means comprise a pair of wheels 22 separated by and connected to a ratchet wheel 23 and which are loosely mounted upon the shaft 6 and have their peripheries serrated sufficiently to enable them to grip the band. Also pivotally mounted in the recess 21 of head 5 is a pawl 24 urged into engagement with ratchet wheel 23 by a suitable spring. A further pawl 25 is mounted upon the frame 4 and is also urged into engagement with the ratchet wheel 23 by a suitable spring. The pawls are so constructed and arranged that when the handle 1 is rocked to move the head 5 about the shaft 6 in an anticlockwise direction as viewed in Fig. 1 the pawl 24 mounted on the head snaps over the ratchet wheel 23 whilst the other pawl 25 engages the teeth thereof and prevents rotation of the serrated wheels 22. Upon reverse movement of the handle 1 the pawl 24 positively engages the ratchet teeth of wheel 23 and rotates the serrated wheels whilst the pawl 25 merely snaps over the ratchet teeth.

Shaft 6, which carries the ratchet and serrated feeding wheels, is eccentrically journaled in frame 4 so that by rotational movement of the handle 26 the serrated wheels 22 are moved downwardly into engagement with the top surface of the upper band which is arranged to lie in the space 27. The end of the lower band may be held by a serrated stud 22a on the portion 28 of the frame.

In the use of the apparatus described the parts are first arranged in the relative positions shown in full lines in Fig. 1 that is to say the handle 1 is clamped to the head 5 by engagement of the studs 18 in their recess 19 and the handle 26 is rotated to move the serrated wheels 22 upwardly. The overlapped band ends are now arranged in the space 27 and after a sleeve has been positioned on the magnetic member 16 the handle 26 is rotated to the position shown in dot and pick lines in Fig. 1 to bring the serrated teeth 22 into engagement with the upper band end. The handle 1 and with it the head 5 is now oscillated back and forth thereby stretching or pulling the band taut about the package. When sufficient tension has been applied in this way the head 5 is moved to the position shown in dot and pick

lines in Fig. 1 thereby positioning the sleeve about the band ends and the handle 1 is then rocked about its pivot 8 by "breaking" its connection with the head 5 thereby operating the jaws 14 to effect interconnecting or sealing of the band ends and sleeve by edgewise crimping action. After completion of the sealing operation reverse movement of the handle 1 releases the jaws and the apparatus may be removed by sliding it laterally of the band after rotating the handle 26 to the position shown in full lines in Fig. 1.

It will be understood that the improvement of the present invention may be embodied in other forms of tool from that illustrated.

What I claim is:—

1. Apparatus for interconnecting overlapped band ends, encased in a sleeve, comprising a head, jaws at least one of which is pivotally mounted thereon shaped for effecting interconnection of said overlapped band ends by deformation of the material thereof and magnetic holding means associated with said jaws for facilitating said interconnecting operation.

2. Apparatus for interconnecting the overlapped ends of metal strapping bands encased in a metal sleeve comprising a head, jaws pivotally mounted on said head and formed for effecting interconnection of said ends by edgewise deformation of the material of said ends and sleeve, and magnetic means associated with said jaws for initially holding said sleeve in a predetermined position in relation to said jaws thereby facilitating application of said sleeve to said band ends and the subsequent interconnecting operation.

3. Apparatus for interconnecting overlapped portions of metal band by deforming the same and a metal seal applied thereto, comprising a movable jaw for engaging and simultaneously deforming the band and seal, and a magnetic seal retaining member located in advance of the jaw to receive and hold in a definite relation to the jaw a seal applied thereto.

4. Apparatus for interconnecting overlapped portions of metal band by deforming the same and a metal seal applied thereto, comprising a pair of movable jaws for engaging and simultaneously deforming the band and seal, and a magnetic anvil mounted between the jaws for receiving and holding a seal in position for application to the band simultaneously with the movement of the jaws thereto and to serve as an abutment against which the jaws effect the deformation.

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