Nov. 29, 1949 C. E. HENDRIXSON, JR., ET AL 2,489,377

MACHINE FOR MOUNTING SEALS ON BALE STRAPS

Filed Nov. 3, 1944

2 Sheets-Sheet 1

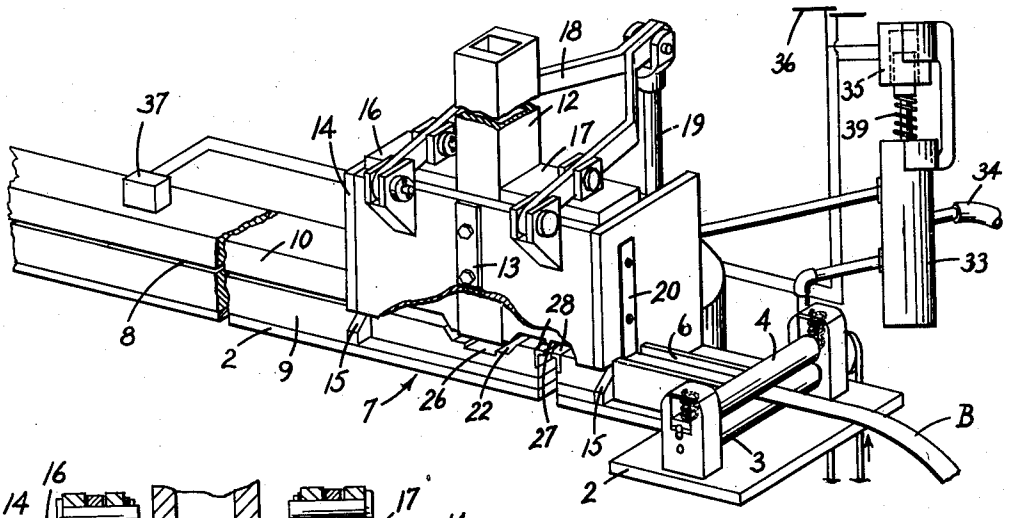


Fig - 1

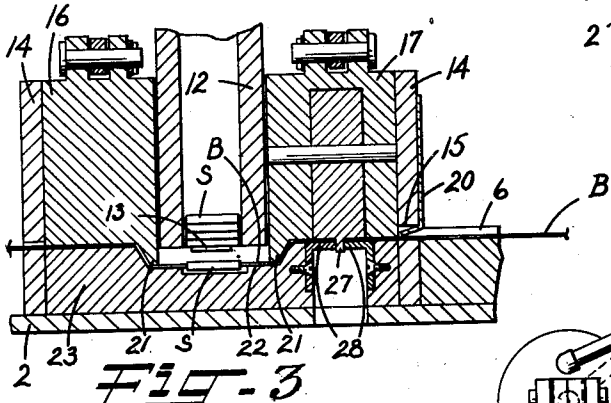


Fig - 3

Fig - 2

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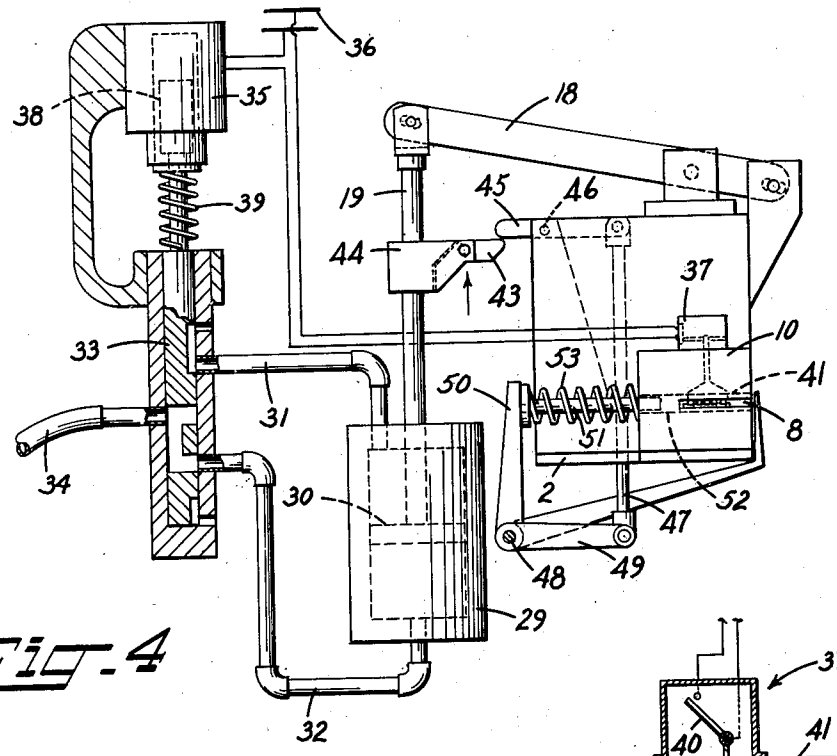


Fig. 4

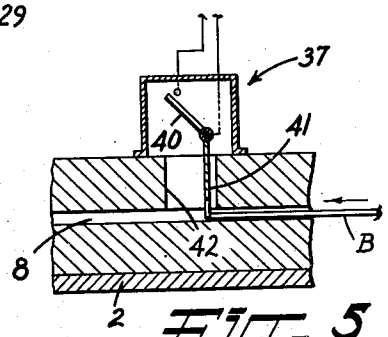


Fig. 5

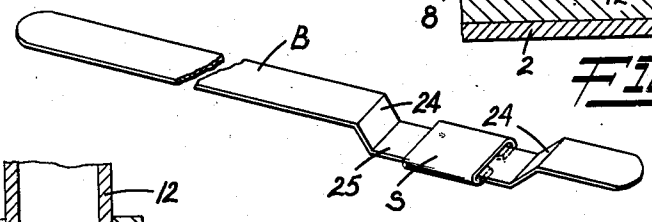


Fig. 7

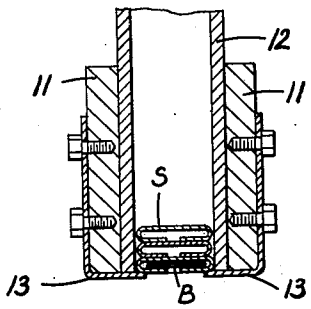


Fig. 6

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MACHINE FOR MOUNTING SEALS ON BALE STRAPS

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4 Claims. (Cl. 140—73)

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This invention relates to a device for supplying a tying or binding strap or band, such as is used for baling fibers and securing packages in general, with a seal while cutting the band to length to prepare the band for subsequent application to packages.

In the past, it has been general practice for the seal to be applied to the strap manually at the time of binding. When so operating, it has been found that seals occasionally fall accidentally into the mass of fibers to be baled and this creates a fire hazard when the fibers are later introduced into opening and processing machines.

The present invention has as its object to prepare binding bands by supplying them with seals before they are brought to the baling press stations, and to so associate the seal and band that the former cannot come off and become lost. Further objects and advantages of the invention will be apparent from the drawing and the description thereof hereinafter.

Figure 1 is a prespective view, partially broken away to illustrate interior parts;

Figure 2 is a plan view;

Figure 3 is a cross-section taken on line III—III of Figure 2;

Figure 4 is an end view, partially in section;

Figure 5 is a section on line V—V of Figure 2;

Figure 6 is a cross-section on line VI—VI of Figure 2; and

Figure 7 is a perspective view of a band with seal applied in accordance with the invention.

The device of the invention is supported on an elongated table or platform 2 which in turn is supported in any conventional manner above the floor by means not shown. A band B which may be supplied by a reel not shown is drawn to the table by feeding rolls 3 and 4. The upper roll 4 is spring-pressed to form a nip with the lower roll 3 which is driven by a belt 5, which in turn is driven by a motor (not shown). This arrangement permits slipping of the rolls with respect to the band when sufficient length has been fed into the device.

The ban B passes through the entrance guideway 6 between the jaws of the cutting and forming device generally indicated at 7 and then passes in a way 8 formed between a bed 9 and an overhanging beam or member 10, which as shown, may be cut away to form the slot 8 which is open at one side throughout its length. The way 8 is a continuation of guideway 6, and the communicating passage through device 7 between the cutting and forming jaws thereof may also be considered a continuation thereof.

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The device 7 comprises a stationary frame whose side walls 11 support an upright seal magazine 12. Spring arms 13 are secured to the walls 11 so that they reach under opposite sides of the magazine and releasably support the seals 5 thereabove, the bottommost being in a position such that the band B passes through its channel passage from the guideway 6. The end walls 14 are slotted at 15 to provide passage for the band, and these slots are open to the side of the device viewed in Figure 1. Also, the wall 11 which appears in Figure 1 is arranged so that it does not obstruct removal of the completed band by lateral sliding thereof from the way 8.

Two movable die blocks 16 and 17 are arranged for vertical reciprocation in the spaces provided between side walls 11, magazine housing 12, and end walls 14, a pivotally connected yoke 18 operated by the rod 19 being provided to effect the reciprocation at the proper instant of time.

A spring 20 (see Figure 3) has a projection reaching into slot 15 and co-operating with the side walls of guideway 6 to assure that the band passes through the bottommost seal in the magazine. Die blocks 16 and 17 have forming portions 21 which co-operate with a recess or depression 22 in the bed 23 to bend or crimp the band at spaced points 24 of its length (see Figure 7) to form an offset portion 25 therein. A cut 26 in the recess 22 receives the seal S when crimping is effected.

The die block 17 contains a replaceable knife or cutter 27 which co-operates with the shearing plates or anvils 28. The cutting dies 27 and 28 are so shaped as to leave a rounded cut at the lagging end of the band to which the seal is applied and also to the leading end of the band extending from the rolls 3 and 4. The cutting device is open below the members 28 and a receptacle may be disposed therebelow to catch the waste cuttings.

A pneumatic system is shown for reciprocating the die blocks and comprises the cylinder 29, the piston 30 secured to rod 19, conduits 31 and 32, and valve 33 for alternately directing compressed air from conduit 34 (connected to an air supply not shown) to conduits 31 and 32. A solenoid 35 connected in series with an AC power supply 36 and a normally open switch 37 operates on a magnetic core 38 in opposition to the spring 39 to move the valve 33 and admit air above the piston 30. The switch 37 (see Figure 5) comprises a pivotally mounted finger 40 of conductive material which is attached to an arm 41 which normally depends through a recess 42 in the beam

10 into the way 8 so that it will be in the way of the band B at a predetermined distance from the cutter blade 27. As shown in Figure 4, the arm 41 may fan out so that band B cannot miss it. Arm 40 or 41 is preferably of spring material so it will flex as band B slides under arm 41.

An arrangement for ejecting the completed band is provided and comprises a trigger 43 which is pivotally mounted on the bracket 44 carried by rod 19, so that on its down stroke the trigger merely rides over past the end of lever 45 which fulcrums at 46, whereas on the upstroke of rod 19, trigger 43 turns lever 45 in a clockwise direction (see Figure 4). This causes downward motion of connecting rod 47 and rocking of the shaft 48 through arm 49. Shaft 48 carries a plurality of levers 50 which bear against plungers 51 extending into transverse bores 52 which intersect the way 8. Rocking of the shaft 48 causes the plungers to move deeper into their bores 52 against the springs 53 and ejects the band B from the way 8. It may drop to the floor or to a receptacle.

Summarizing the operation of the device briefly, rolls 3 and 4 feed the band B through guideway 6 between the jaws of the press 7 into the way 8. As it passes the press 7, the band passes through the bottom seal in the magazine 12. When a predetermined length is fed, the band itself closes switch 37 which raises the core 38 upward with the valve and directs air into the cylinder 29 above the piston 30. This causes the yoke 18 through rod 19 to press the die blocks 16 and 17 downward which bends the band at 24 and cuts it between 27 and 28. The downward motion of the band pulls the seal past the spring arms or clips 13, so that the next seal drops into position to receive the next band. In addition, the bending of the band at 24 causes it to again open switch 37 which de-energizes solenoid 35 and allows spring 39 to move valve 33 to the position shown in Figure 4 admitting air beneath piston 30, thus lifting yoke 18 with the dies and bringing trigger 43 into operative engagement with lever 45, which causes rock shaft 48 to force plungers 51 to eject the finished band. Until the die blocks 16 and 17 are lifted and the finished band is ejected, the rolls 3 and 4 slip with respect to the band B, but after ejection, the process repeats itself automatically.

The length of band can be varied merely by changing the relative position of switch 37 and the cutting dies 27 and 28.

The prepared bale strap is applied to a package while held under pressure in the baling apparatus in such a manner that the seal is held out of contact with the package by the offset crimped portion of the band and the free end of the band is inserted under the seal, the spring action of the crimped offset portion providing enough friction to keep the seal from slipping. Any conventional fastening tool may be used to secure the free end of the band in place under the seal, such as by crimping the seal against the band. After fastening the band and release of the bale from the baling press, the bale expands and the band becomes taut, so that it tends to straighten out the crimped offset portion, the extent of straightening depending upon the relation between the amount of slack originally present before release of the bale and the amount of expansion of the bale that occurs.

Among the advantages of the present invention are the following: The crimping of the band adjacent each side of the applied seal permits the use of a standard band and standard seal. It is not necessary, therefore, to use specially designed seals and bands to prevent disconnection of the seal from the band and accidental loss of seals. Because the crimped section of the band holds the seal in place, the prepared bands are complete, ready for fastening, and the hands of the operator are free to manipulate the tools, so that he can more efficiently carry out the fastening operation. The band is infinitely adjustable as the free end is threaded through the seal, the spring effect created by the crimped section making it possible to locate the seal in any position relative to the free end of the band. The crimped offset section is of a definite predetermined length which is the same for each band, so that uniform overlapping of the free ends is obtained. This is desirable for good holding of the seals and minimizes errors of judgement on the part of the operator who fastens the band, thereby avoiding the difficulties that arise from variable lengths of bands or variable circumferential lengths as fastened, which would either constrict the bale too much and take an undue share of the load, or allow the bale to bulge at places, making it awkward to stack the bales in shipment or storage.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. In combination, a guideway, a magazine for a plurality of superimposed seals, a depression in the guideway below the magazine and reciprocable deforming die means adjacent the magazine arranged to co-operate with the depression for deforming a band extending through the guideway and bottommost seal in the magazine, said magazine comprising spring members extending around opposite sides thereof so that the bottommost seal rests thereon with its channel in substantial alignment with the guideway and is releasable therefrom during deforming of the band.

2. In combination, a guideway, a magazine for a plurality of superimposed seals, a depression in the guideway below the magazine and reciprocable deforming die means adjacent the magazine arranged to co-operate with the depression for deforming a band extending through the guideway and the bottommost seal in the magazine, cutting means arranged in advance of the deforming die means and magazine, said magazine comprising spring members extending around opposite sides thereof so that the bottommost seal rests thereon with its channel in substantial alignment with the guideway and is releasable therefrom during deforming and cutting of the band.

3. In combination, guide means having a guideway therein, a recess in the guideway extending transversely thereof, means for feeding a band longitudinally in the guideway past the recess, means along the guideway opposite the recess for releasably supporting a seal with its channel in substantial alignment with the guideway, spaced die means opposite the recess adjacent both ends of the supporting means in the direction of travel of the band in the guideway, means for reciprocating the die means toward and from the recess, said die means comprising both forming and cutting elements, the cutting elements being disposed in advance of the recess with reference to the direction of travel of the band

through the guideway, the guideway and recess being open along one side of the path of travel of the band to permit lateral ejection of the band from the guide means, reciprocable ejector means on the other side of the guideway, and means for moving the ejector means into the guideway to eject a band after the die means is released from the band.

4. The combination of claim 3 in which a common reciprocable driving member is provided to operate both the die means and the ejector means, and the operating connection provided between the driving member and the ejector means actuates the ejector means during the return stroke of the die means.

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