April 28, 1942. N. J. POUX 2,281,008

MACHINE FOR MAKING SEPARABLE FASTENERS

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Fig. 1.

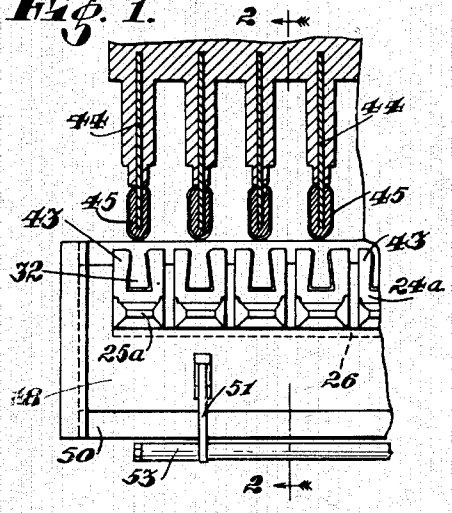


Fig. 3.

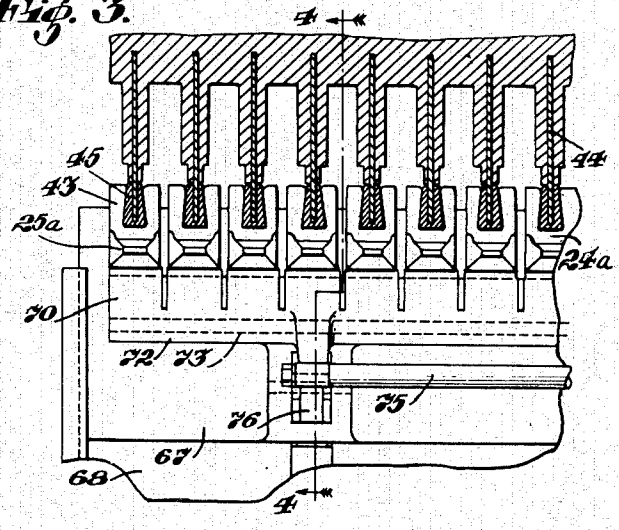


Fig. 2.

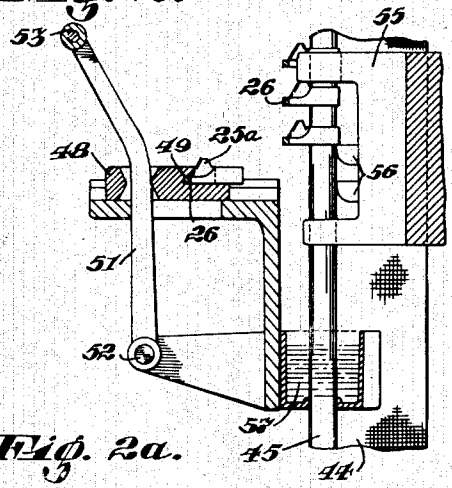


Fig. 4.

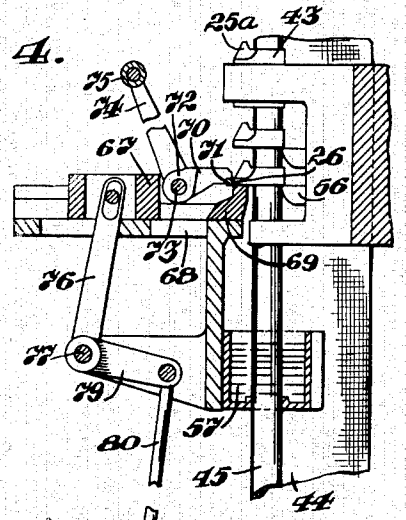


Fig. 2a.

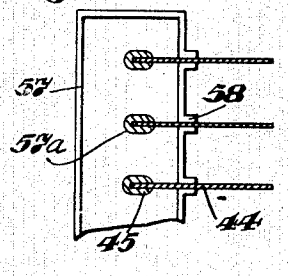
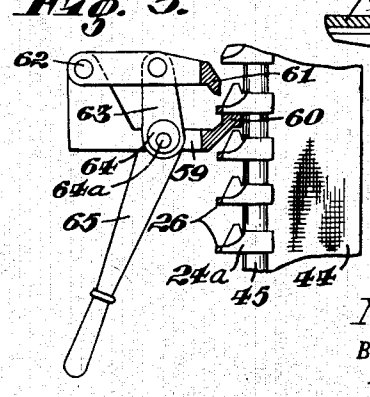


Fig. 5.



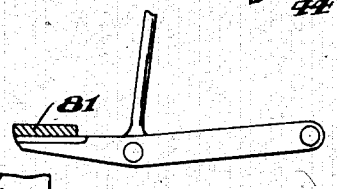
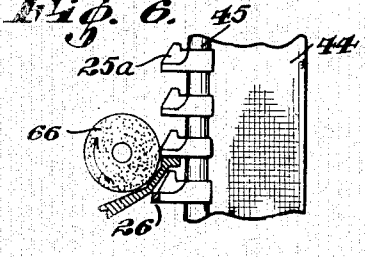


Fig. 6.



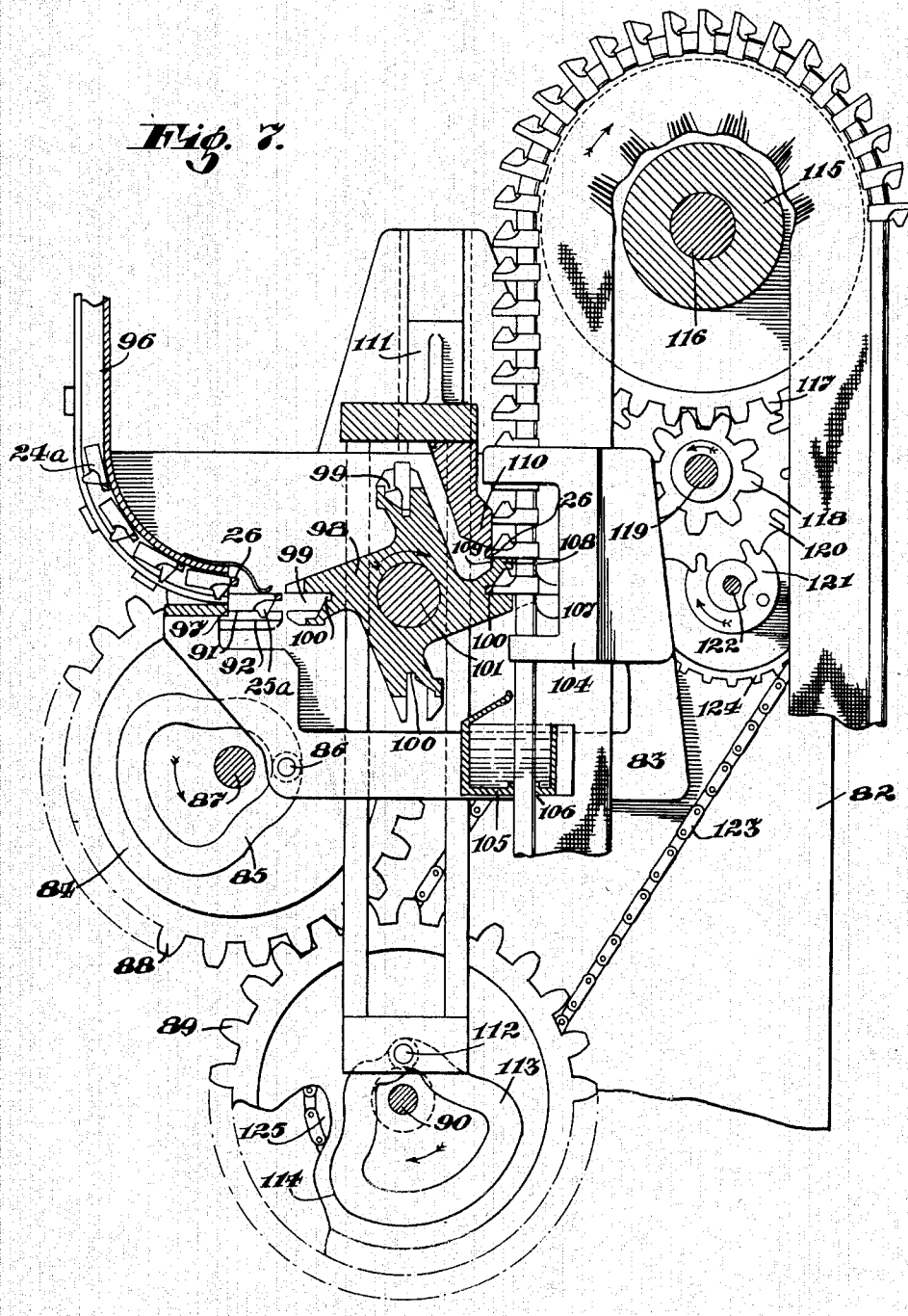
INVENTOR.
Noel J. Poux.
BY R. S. Kelley.
ATTORNEY.

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Fig. 7.



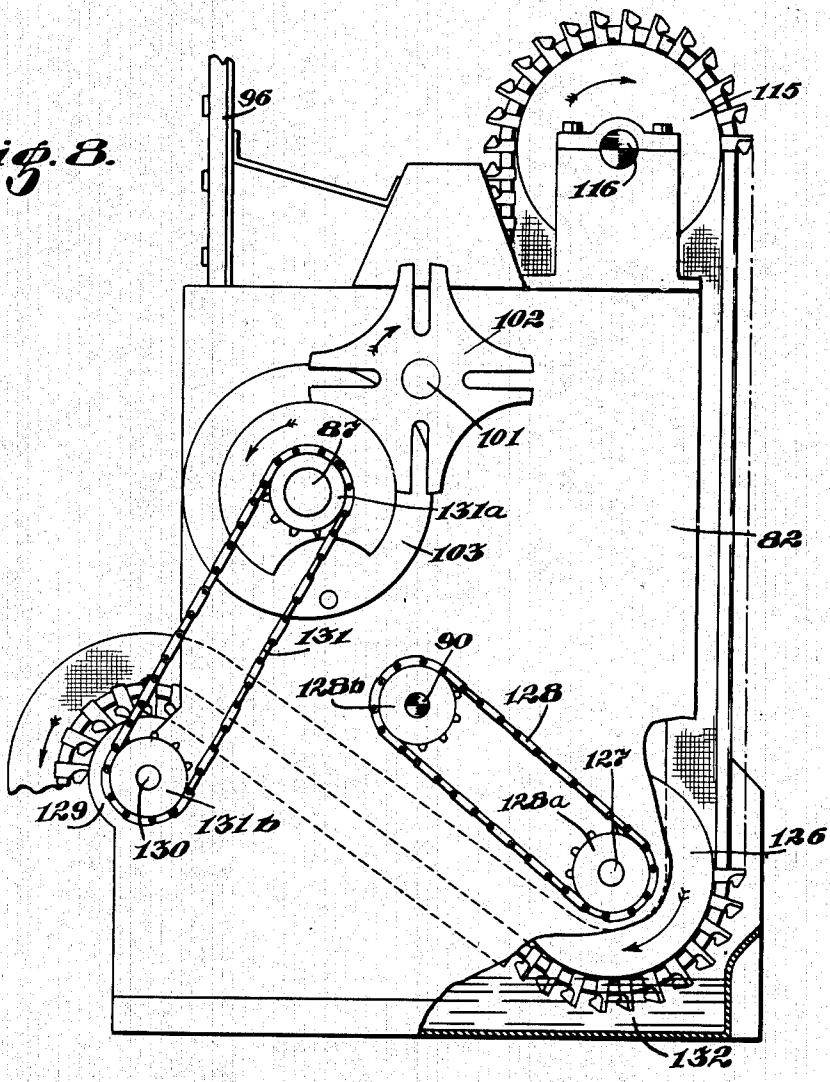
INVENTOR.
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MACHINE FOR MAKING SEPARABLE FASTENERS

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Fig. 8.



INVENTOR.
Noel J. Poux.
BY R. S. Kelley.
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,281,008

MACHINE FOR MAKING SEPARABLE FASTENERS

Noel J. Poux, Meadville, Pa., assignor to Talon, Inc., a corporation of Pennsylvania

Original application November 20, 1933, Serial No. 698,801. Divided and this application October 28, 1939, Serial No. 301,852

3 Claims. (Cl. 18—1)

This invention relates to machines for manufacturing slide fasteners and is a division of my co-pending application Serial No. 698,801, filed November 20, 1933, now Patent No. 2,202,230, dated May 28, 1940.

The principal object of my invention is to provide an improved machine for manufacturing slide fastener stringers from preformed strips of slide fastener members. According to the invention preformed strips of members with the members arranged cross-wise in the strip and integrally joined together, are fed to the machine and a multiple of stringers are made at one time, the number of stringers depending upon the number of members in each of the strips. In the operation of the machine, each strip is severed and the various members of a strip are simultaneously attached, one to each of a plurality of tapes.

The slide fastener member strip illustrated consists of a series of slide fastener members 24*a* arranged side by side in the strip and integrally connected by a rib 26 to which each of the fastener members are connected to this rib at the ends in which the head portions 25*a* of the slide fastener members are formed so that the jaw portions 43 of each slide fastener member project from that side of the strip opposite the rib 26.

In the accompanying drawings I have shown for purposes of illustration some embodiments which my invention may assume in practice. In the drawings:

Fig. 1 shows a plan view of a machine forcing the beaded edges of the stringers into slots formed by the jaws;

Fig. 2 a side elevation, partly in section, of said machine;

Fig. 2*a* a plan view of the tape saturating tank;

Fig. 3 a plan view of an alternative form of machine;

Fig. 4 an elevation, partly in section, of a machine for compressibly forcing the stringers into the slots between the jaws and for separating the strips of interlocking members;

Fig. 5 a manner of separating the strips when placed on the stringers as, for instance, in the machine shown in Fig. 2;

Fig. 6 an elevation showing an alternative method and apparatus for severing the interlocking members on the strips;

Fig. 7 a vertical section of an automatic machine for placing the interlocking members on the tape, or stringers; and

Fig. 8 an end elevation of this machine.

In general the machine is operated automatically to force a strip on a plurality of tapes 44 each of which has a beaded edge 45 for receiving the jaw portions of the fastener members.

A convenient machine for accomplishing this is shown in Figs. 1 and 2. A carrier 48 is slidingly mounted on a frame 50. The carrier has a strip receiving socket 49 and is adapted to be actuated by levers 51 carried by pins 52 mounted on the frame. The levers have an operating rod 53 so that they may be readily moved forward. Stringers 45 are carried through guides 55 and preferably extend to a feeding mechanism advanced as the carrier is operated, such feeding mechanism being omitted in Figs. 1 to 5. Pressure fingers 56 are arranged on the guide spaced above and below a part of the stringer which is about to receive a strip. The stringer is drawn through a bath of acetone. This is accomplished by providing a tank 57 in which there is a bottom slot 57*a* and a slot 58 in the side wall. The stringer forms a closure with these slots as the stringer is advanced and the ribbed edge of the stringer is saturated with a solvent, such as acetone. As the stringer is advanced the finished strips are forced forward, compressing the ribbed edges of the stringer into the slots 32. The solvent carried by the stringer operating on the material such as Celluloid produces a cement which securely fastens the jaws to the stringer. This solvent as it evaporates leaves this cement with sufficient tenacity to hold the members in place until the solvent is sufficiently dissipated to permit the cement to finally set.

After the strips are thus placed on a plurality of stringers the members may be severed, one from another, in any convenient manner, a method and tool for accomplishing this being shown in Fig. 5 where the strip is severed off the front of the members, thus severing the members of a strip. This tool comprises a frame 59 with a backing and severing blade 60 which is placed under the member. An opposing shear blade 61 is arranged above the rib 26 and is pivoted to the frame at 62. Links 63 are secured to the blade 61 and are mounted on eccentrics 64 carried by a rock shaft 64*a*. The rock shaft is operated by a lever 65 and as this lever is swung the blade 61 is brought down into shearing relation through the action of the eccentric and thus shears the rib 26 from the members, thus separating them.

Another method is shown in Fig. 6 wherein a grinding wheel 66 of sufficient length is adapted

to remove the rib 26 by a grinding operation as the members on the stringers are fed to it.

In Figs. 3 and 4 an alternative manner of handling the member strips and severing the uniting rib 26 is indicated. In this a carrier 67 is slidingly mounted on a frame 68. It has a shear base 69 for the member strips. A shear blade 70 is adapted to operate on the rib 26 and sever it. The shear blade has a notch 71 which acts as a guide and stop for the member rib 26. The blades 70 project from a bar 72. The bar 72 is mounted on a rod 73 and the rod 73 is operated by levers 74 connected by an operating rod 75. A bell crank lever 76 operates on the carrier 67. This lever is mounted on a pin 77 arranged on a post 78 projecting from the frame. One arm 79 of the bell crank lever is connected by a link 80 with a foot pedal 81.

The tape is saturated and guided into position in the same manner as the structure shown in Fig. 2. The strip is placed on the base 69 and secured thereon by the notched end of the shear blade 70. The operator then depresses the foot pedal and forces the strip on to the beaded edge of the tape. At the completion of this operation the operator, by forcing the lever 74 forward, operates the shear blade 70 and severs the rib 26, thus separating the members on the tape.

In Figs. 7 and 8 I have shown an automatic machine for placing the strips on the tapes and for treating the tape and the finished members. The machine is formed with a frame 82. A carrier 83 is slidingly mounted on this frame. A cam wheel 84 having a cam slot 85 operates through a roller 86 to reciprocate the carrier 83. The cam is mounted on a shaft 87. A gear 88 is fixed on the shaft 87 and meshes with a gear 89 fixed on a shaft 90 and the shaft 90 is driven from some source of power (not shown). A work rest 91 provided with grooves 92 for receiving the projections 25*a* on the strips 24*a* is mounted on the carrier 83. The work rest has a stop shoulder 97 at its rear edge which engages the rear of the strip 24*a* so as to enable it to force the strip forward for engagement with the tape. Strips are fed to the work rest from a guide magazine 96 with each reciprocation of the carrier 83. A work feeding wheel 98 is provided with work receiving sockets 99 and as the carrier 83 is moved forward a strip 24*a* is moved forward with the work rest and forced into the work receiving socket 99, this being provided with an extension 100 receiving the connecting rib 26 so as to firmly engage the member strip 24*a*. The wheel is fixed on a shaft 101. The wheel is advanced 90° with each cycle of the machine and after a movement of 180° is brought opposite the tape. In order to make these advances and provide the necessary dwell at the different stations the shaft 101 is driven by a Geneva movement having one member 102 fixed on the shaft 101 and a companion member fixed on the shaft 87 so that with each complete rotation of the shaft 87 which has an equal speed ratio with the drive shaft 90, the feeding wheel is advanced 90° and then retained during a large part of the cycle through the dwell of the Geneva movement. A tape guide 104 is mounted on the carrier 83. This is provided with the proper guiding slots for the tape. A saturating tank 105 is also arranged on the carrier and has a slot, the tape extending through the slot 106 in the manner more definitely shown in plan view in Fig. 2*a*. Pressure fingers 107 are provided in the guide 104 to force the tape forward toward the feeding wheel and into the slots of the strip carried thereby as the carrier 83 is reciprocated toward the rear. After the rib of the stringer is compressibly forced into the slots 32 of the strip the next forward movement of the carrier withdraws the tape and with it the strip so secured. The tape is then advanced by mechanism hereinafter described and on the return movement of the tape the strip last attached is carried forward over a face 108 on the feed wheel. The member strip in the final position projects over the face 108 leaving the uniting strip, or rib 26 beyond a shear face 109. A shear blade 110 is mounted on a reciprocating bar 111 and the bar 111 is slidingly mounted in the frame. The bar is provided with a roller 112 which extends into a cam slot 113 in a cam wheel 114. The cam wheel is fixed on the drive shaft 90. The timing of the cam is such that during the period that the tape is in its forward position the knife, or shear 110 is depressed and severs the uniting strip or rib 26, thus disconnecting the several members as they are secured on the tape.

The tape is carried over a feed wheel 115. This feed wheel may be of any convenient structure so as to engage and advance the tape as it is carried over it. It is fixed on a shaft 116. A gear 117 is also fixed on the shaft and meshes with a gear 118. The gear 118 is carried by a shaft 119. A Geneva movement is provided, one member 120 of which is mounted on the shaft 119. The other member, 121, of this movement, is mounted on a shaft 122. The shaft 122 is driven through a sprocket chain 123 operating through a sprocket 124 on the shaft. The chain extends to a sprocket on the drive chain 90. The Geneva movement is provided with sufficient stations so spaced as to advance the tape the distance of one interlocking member with each cycle of the machine. The tapes are carried around a wheel 126. This wheel is mounted on a shaft 127 and the shaft is driven by a sprocket chain 128 operating on a sprocket 128*a* on the shaft and driven from a sprocket 128*b* on the shaft 90. The tapes are also carried over the feed rolls 129. These rolls are mounted on a shaft 130 and driven by a chain 131 extending from sprockets 131*a* on the shaft 87 and operating on a sprocket 131*b* on the shaft 130. A tank 132 is mounted in the base of the frame and a solvent, such as acetone, is maintained at a level in this tank to immerse the interlocking members on the tape as the tape is advanced. This solvent working on such materials as Celluoid dissolves a sufficient amount of the surface as to smooth the corners and rough edges and give to the surface a polished effect. It will be seen, therefore, that this machine as it is operated automatically takes the united strip from the guide 96, delivers the same to the feed wheel, is carried by the feeding wheel into position to receive the tape and at the tape position the tape is forced compressibly into the slots of the members on the strip, the tape is advanced and the uniting strip severed, thus disconnecting the members on adjacent tape. The tapes so advanced are advanced through the feeding mechanism, step by step. A saturating tank is provided so that the tape as it advances to receive the members is saturated with the solvent forming with the Celluloid a securing cement so that the members as forced into place are at the same time cemented on the stringer. The tapes are advanced so as to immerse the members and

thus dissolve the surface to an extent to smooth the corners and the surfaces.

While I have shown and described in this application several embodiments which my invention may assume in practice, it will be understood that these embodiments are merely for the purposes of illustration and that various other forms may be devised within the scope of my invention as set forth in the appended claims.

What I claim as my invention is:

1. In a machine for forming separable fasteners, the combination of means for advancing a stringer, means for applying interlocking members thereto, and means for supplying cement for the engaging surfaces comprising a tank, a slot in the tank through which the stringer is drawn, the stringer being related to the slot to seal the slot.

2. In a machine for making separable fasteners of the class described, the combination of means for guiding a plurality of stringers in closely spaced parallel relation, means for feeding said stringers lengthwise step by step through the stringer guide means, means for feeding to a position adjacent the edges of said stringers, fastener member units each of which consists of a plurality of integrally united fastener members, the fastener members in each unit corresponding in number and spacing to said parallel stringers, and means operating in timed relation to said stringer feeding means and said unit feeding means for simultaneously attaching the members of each unit one to each of said stringers.

3. In a machine for making separable fasteners of the class described, the combination of a guide for a plurality of stringers held in closely spaced parallel relation, means for feeding said stringers lengthwise step by step through the guide, means for supplying strips of fastener members each of which strips consists of a plurality of fastener members joined together, the members in each strip corresponding in number and spacing to said parallel stringers, a transfer wheel having means for receiving said strips one at a time from said supply means, means for moving said wheel to transfer said strip to a position opposite the edges of said stringers in said guide, and means for moving said guide to force said tapes into engagement with said fastener members in the wheel whereby the members in the strip are attached simultaneously one to each of said stringers.

NOEL J. POUX.