

June 15, 1937.

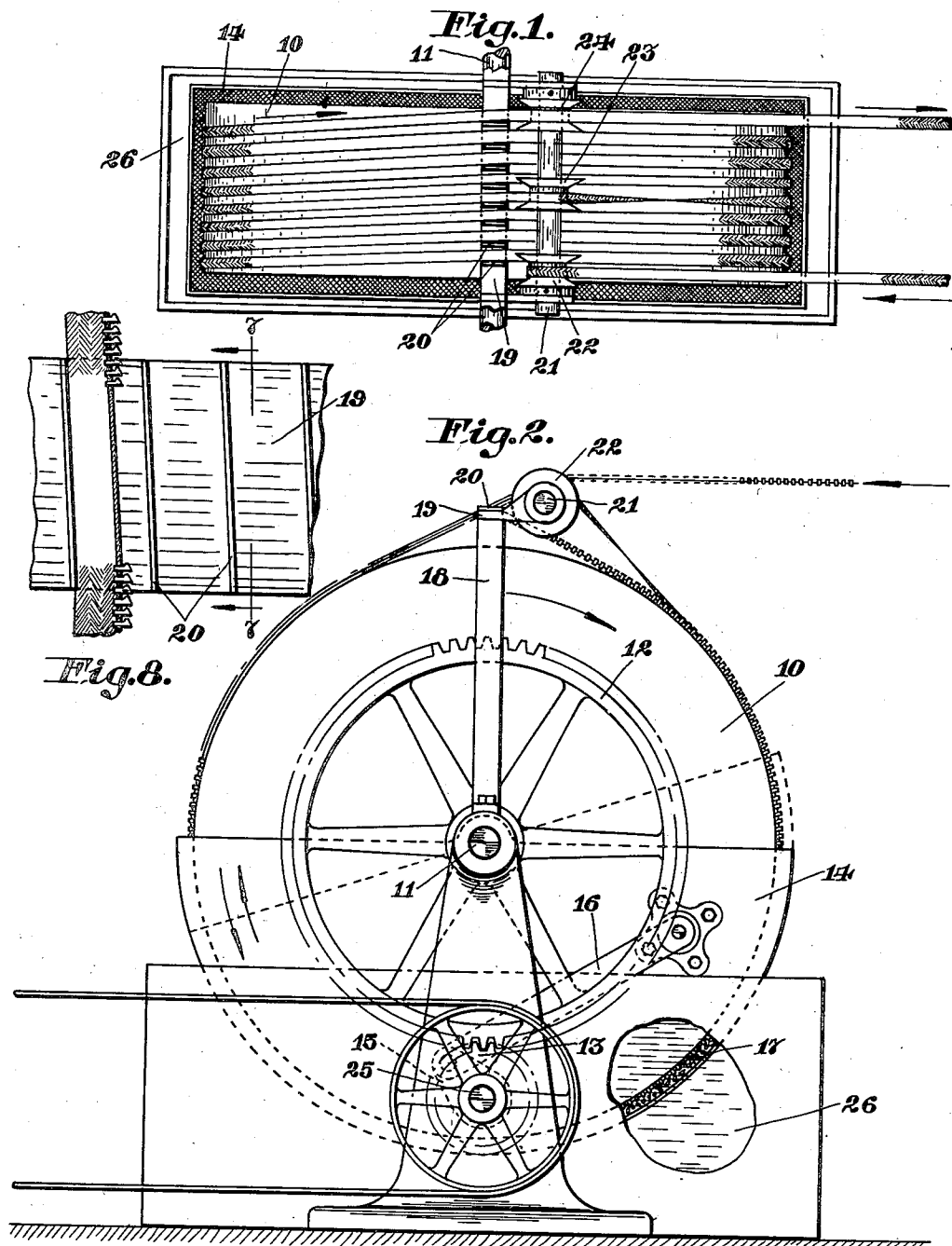
G. SUNDBACK

2,083,930

MACHINE FOR SMOOTHING FASTENERS

Filed July 21, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

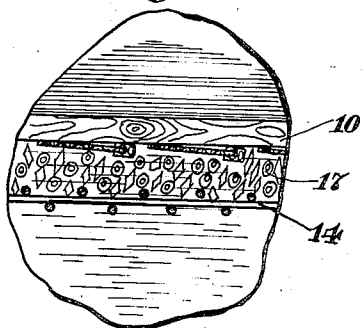


Fig. 5.

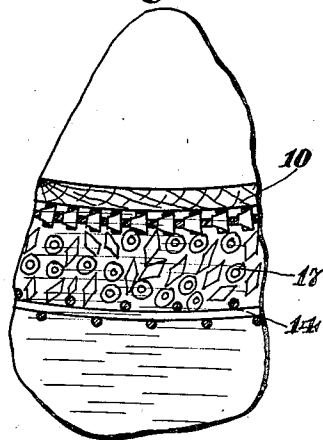


Fig. 3.

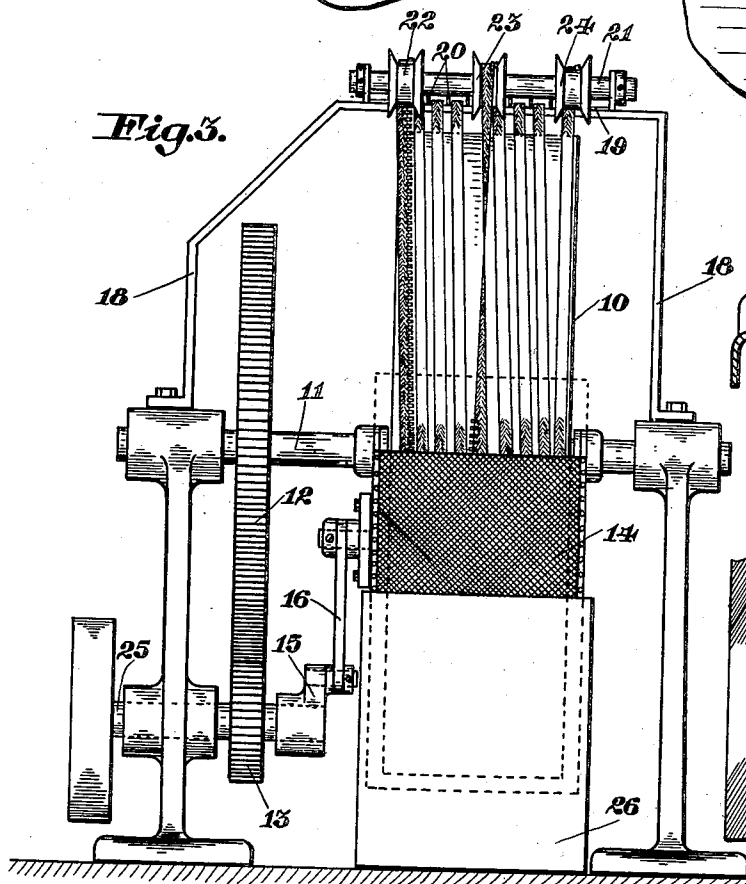


Fig. 7.

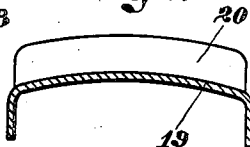
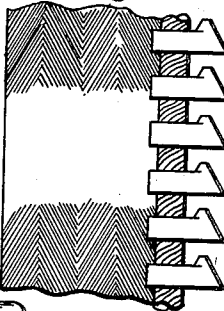


Fig. 6.



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UNITED STATES PATENT OFFICE

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MACHINE FOR SMOOTHING FASTENERS

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6 Claims. (Cl. 51—19)

My invention relates to a method of and means for smoothing the surfaces of metal slide fastener elements after they are attached to a tape stringer.

In the manufacture of slide fasteners, a large number of small metal elements must be accurately formed to shape and attached to a tape in closely and accurately spaced relation. This must all be done at a comparatively low cost and it has been found more economical to attach the fastener elements directly to the tape stringer in a single machine immediately after they are cut and formed. This gives no opportunity to smooth or finish the surfaces of the fastener elements except in some instances by swaging dies, which are troublesome and expensive.

It has been proposed in a prior patent application of mine, to tumble the fastener stringers, after the metal elements are attached to the tape, in a loose mass of abrasive particles. While this practice is satisfactory to a certain extent, it has some disadvantages which the present invention aims to overcome. For example, in tumbling continuous lengths of stringers or several short lengths, the mass of stringers becomes tangled and balls together so that they are difficult to straighten out. Furthermore, this does not permit efficient action of the abrasive particles.

According to the present invention, I pull continuous lengths of fastener stringers through a loose mass of particles. Preferably I also agitate the abrasive particles and wash the tape during the process.

In the accompanying drawings, I have shown for purposes of illustration and description one embodiment of a machine for carrying out my invention in practice. In these drawings:

Fig. 1 is a top plan view of a machine constructed in accordance with my invention;

Fig. 2 is a side elevation of the same machine;

Fig. 3 is an end elevation of the same machine;

Fig. 4 is a fragmentary section through the drum and container of the abrasive particles taken in the direction of the axis of the drum;

Fig. 5 is a fragmentary cross-section;

Fig. 6 is an enlarged view of a typical slide fastener stringer;

Fig. 7 is a section on line 7—7 of Fig. 8; and

Fig. 8 is a plan view of guide member and flanges.

The machine illustrated comprises suitable framework and bearings for supporting the rotary drum 10, turning on a shaft 11. This drum is driven through suitable gears 12, 13

from any suitable source of power. The speed of the rotation of the drum is comparatively slow, although if the drum is made three or four feet in diameter a large output will result.

The drum is partially surrounded by a perforated or screen walled container 14 which is also supported by suitable bearings on the shaft 11. This container is oscillated by means of a crank 15 mounted on the end of the shaft 25, and operating through a link 16 connecting the shaft and the container.

The wall of the container is spaced a short distance from the outer surface of the drum so as to provide space for abrasive particles such as those indicated at 17. These abrasive particles may be of any commonly known shape. Preferably, I employ a variety of shapes of small steel members, such as small cylinders with sharp corners, conical pieces and spherical balls with an annular disk, and plain spherical balls.

The lower part of the drum 10 together with the oscillating screen walled container 14, operate in a bath 26, which thoroughly cleans the fastener stringer and carries away any dust formed through the action of the abrasive particles on the fastener elements, and also acting more or less as a lubricant.

Supported above the drum on suitable standards 18 is a stationary guide member 19, which has guide flanges 20 shown in Figs. 7 and 8, between which the stringer passes. These guide flanges are arranged at a small angle relative to the plane of rotation of the drum in order that the stringer can be threaded onto and across the drum. In Fig. 1, it will be noted that the stringers lead into the guides at an angle in order that they may be shifted to the next position on the drum. The same standard also carries a shaft 21 which has three pulleys 22, 23, 24. The fastener is fed over the first pulley 22 and goes onto the drum at the left hand side as viewed in Figs. 1 and 3. Approximately midway of the drum the stringer passes over the pulley 23, the stringer being twisted so that it will be inverted as it falls back onto the drum. This exposes the opposite side of the fastener elements to the action of the abrasive particles. The stringer progresses across the drum and discharges over the pulley 24.

The operation of my improved machine will now be readily understood. It is merely necessary to feed a continuous stringer into the machine and have it automatically discharge the finished product. The fastener elements are forced through the abrasive particles several

times while the abrasive particles are being agitated. Simultaneously the cleaning fluid will be constantly washing in and out through the container and keep the tape constantly clean. At the same time, there is an advantage in wetting the fastener stringer after the fastener elements have been clamped in position so as to render it somewhat more pliable.

While I have shown and described in this application, one embodiment which my invention may assume in practice, it is understood that this embodiment is merely for the purposes of illustration and description, and that other forms may be devised within the scope of my invention as defined in the appended claims.

What I claim as my invention is:

1. A machine for smoothing the surfaces of slide fastener elements on the edge of a tape stringer, which comprises a holder having a rigid surface against which the stringer is held so as to expose all surfaces of the metal elements except those contacting said rigid surface, and means for subjecting the exposed surfaces of the fastener elements while so held to the action of abrasive particles, and means for inverting the fastener stringer during the process to expose the surface of the fastener elements which was first in contact with said rigid surface.

2. A machine for smoothing the surfaces of slide fastener elements on a tape stringer, comprising a perforated container, abrasive particles in the container, means for continuously supplying cleaning fluid to the interior of said container, and means for positively guiding and forcing a continuous length of stringer through said container in contact with said abrasive particles.

3. In a device for smoothing the fastening elements of fasteners of the type having a flexible tape and fastening elements secured thereto, the combination of a container for abrasive particles and a support in said container having a rigid surface adapted to support a continuous piece of tape throughout its surface, said container having openings in its walls permitting entrance and

exit of cleansing fluid, and a bath of cleansing fluid in which said container is submerged whereby said flexible tape is subjected to a continuous washing action.

4. In a device for smoothing fastening elements of complete fasteners of the type having a flexible stringer with fastening elements secured thereto, the combination of a container for a loose mass of abrasive particles, a drum in said container having a rigid cylindrical surface adapted to support a substantial and continuous length of stringer throughout the entire surface of the stringer, means for rotating the drum to carry the stringer through the particles while supported on said rigid surface, and means for continuously guiding a stringer to one side of said drum and removing it from the other side of said drum during the rotation of said drum.

5. In a device for smoothing fastening elements of complete fasteners of the type having a flexible stringer with fastening elements secured thereto, the combination of a container for a loose mass of abrasive particles, a drum in said container having a rigid cylindrical surface adapted to support a substantial and continuous length of stringer, and means for feeding said continuous stringer to one side of the drum and for removing it from the other side of the drum during the rotation of the drum, and means for oscillating the container to agitate the particles.

6. In a device for smoothing fastening elements of complete fasteners of the type having a flexible tape and fastening elements secured thereto, the combination of a container for a loose mass of abrasive particles, a drum in said container having a continuous length of fastener tape wound helically about the drum, means for rotating the drum to move the tape through the abrasive particles, means for continuously supplying the tape to one side of the drum and removing it from the other side, and means for reversing the tape to expose both sides to the abrasive particles during its movement.

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