Oct. 23, 1934. G. A. PIEPENBRING 1,978,282

PROCESS AND APPARATUS FOR PRODUCING CUT AND FOLDED LABELS

Filed April 9, 1931 2 Sheets-Sheet 1

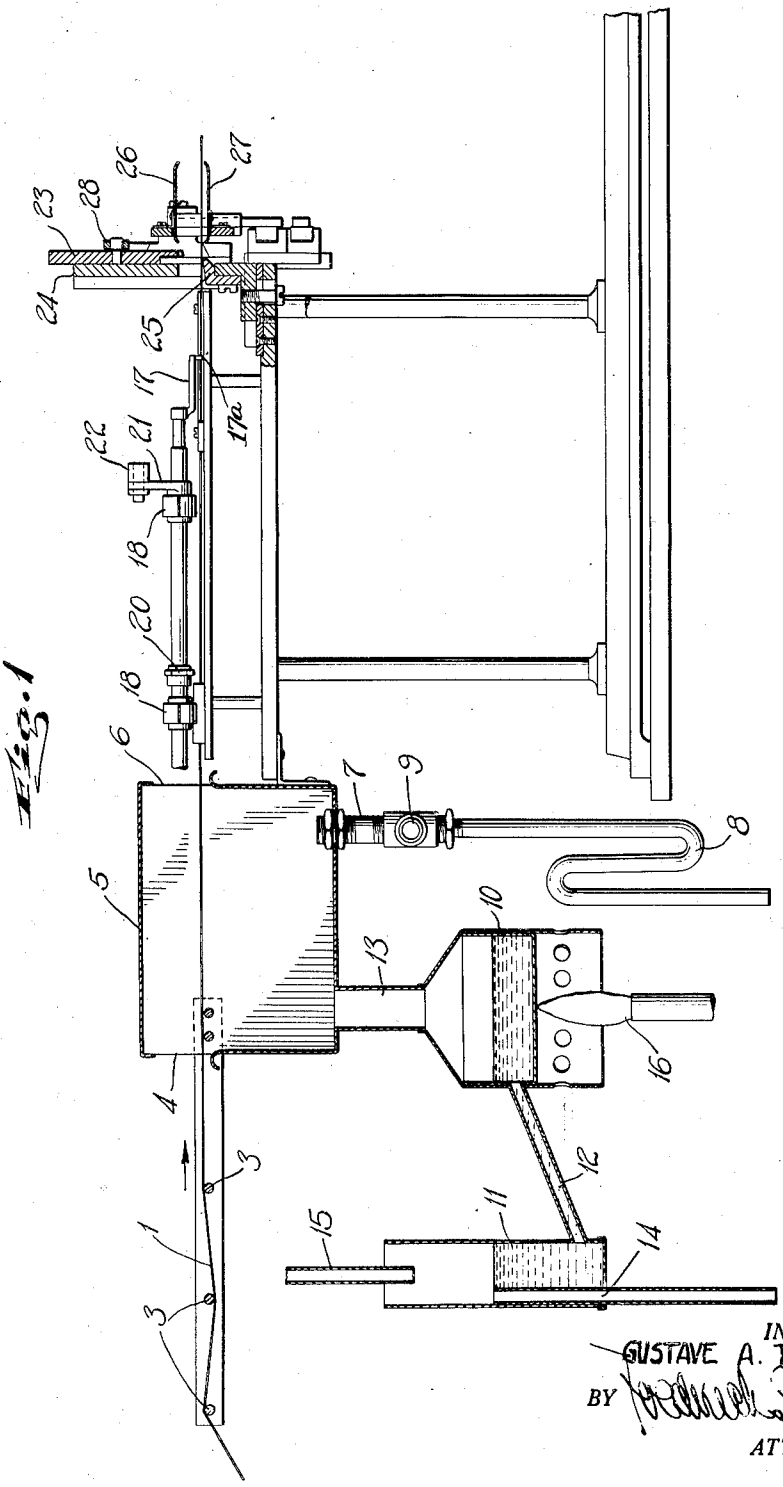

Fig. 1

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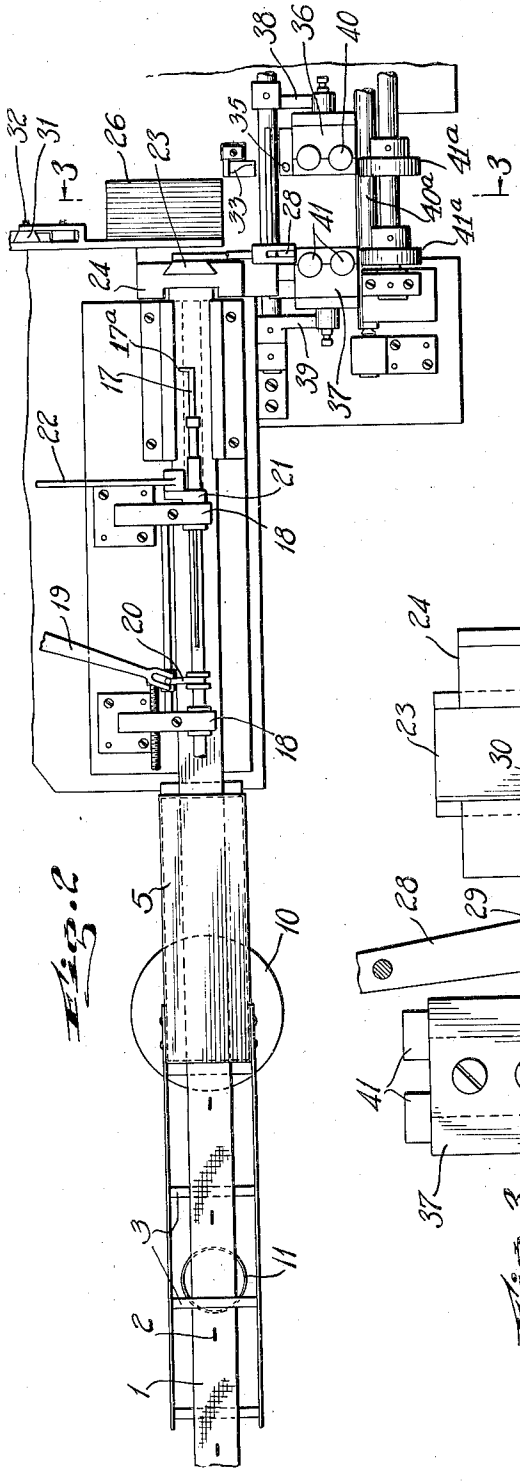

Fig. 2

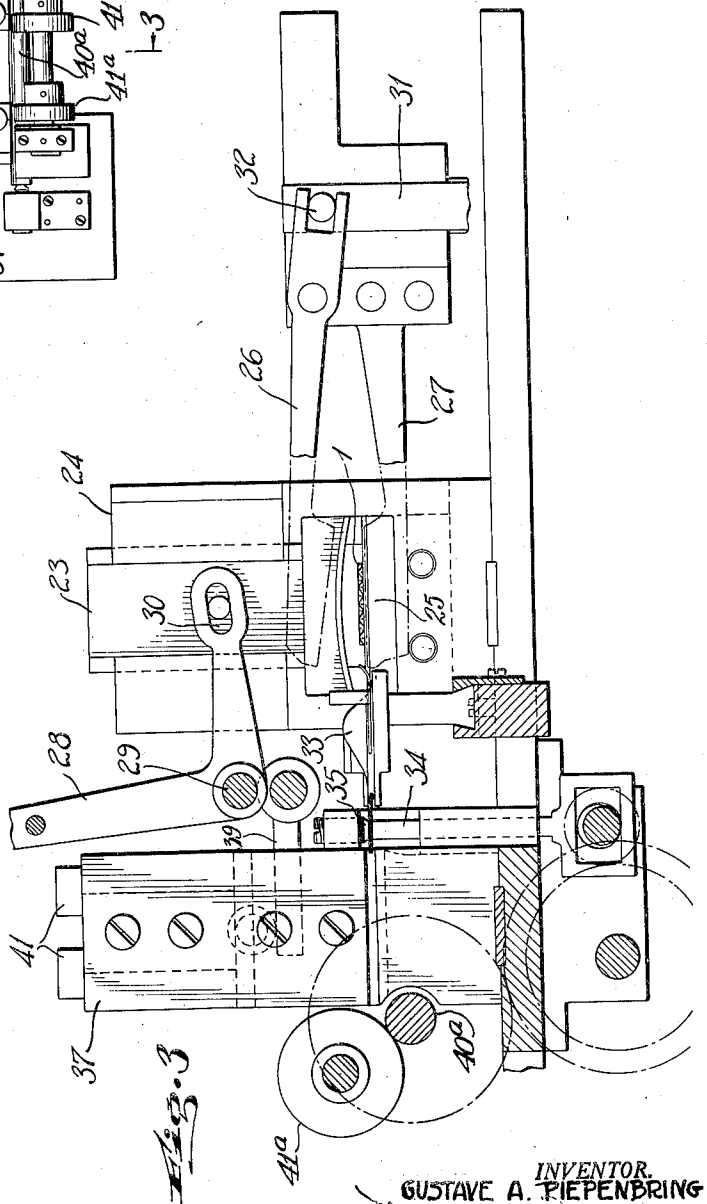

Fig. 3

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UNITED STATES PATENT OFFICE

1,978,282

PROCESS AND APPARATUS FOR PRODUCING CUT AND FOLDED LABELS

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Application April 9, 1931, Serial No. 528,821

4 Claims. (Cl. 270—93)

The invention relates generally to label cutting and folding processes and machines and has for an object to provide a means and method for cutting individual labels from a continuous strip of the same, folding over the cut edges for the purpose of improving their appearance and for the purpose of facilitating attachment to a garment by sewing or otherwise.

The principal object of the invention is to so carry out the process as to enable the feeding, cutting, and folding processes, which will be hereinafter described, to be carried out at a high rate of speed, and to produce cut and folded labels of uniform dimensions and as nearly as possible of a perfect rectangular shape. One of the chief obstacles in the accomplishment of these ends has heretofore lain in the characteristics of the fabric of the label strip. This is usually woven from cotton yarn or thread in an ordinary loom, the design on the label being also woven on the same loom in silk or other suitable fabric. Owing to inherent imperfections in the weaving process, it is found that numerous localized stresses are interspersed throughout the fabric, tending to cause it to wrinkle and to become distorted from its symmetrical rectilinear shape. Difficulties of the same sort are also caused by carelessness in handling, which also sometimes causes wrinkles to appear in the strip. Furthermore, the strip as it comes from the loom is in most cases, comparatively speaking, somewhat stiff, and any stresses, strains or wrinkles which may find their way into it make it difficult, especially in view of its extreme light weight; to carry out on it the operations of a cutting and folding machine when operated beyond a certain speed, the limit of which, however, is often below the speed capacity of the machine itself. That is to say, the maximum speed of prevailing types of label cutting and folding machines is fixed not by the capacity of the machines themselves but by the limitations created by the characteristics of the strip on which they operate. It is one of the objects of the invention to remove some of these objectionable conditions in order that not only may such machines be run at a much higher speed than at present but also in order that more perfect labels may be produced.

Referring to the drawings,

Fig. 1 is a view in elevation of a portion of the machine showing a steaming apparatus, the strip feeding mechanism, the cut-off knives, and the fingers which feed the cut-off labels to the fold-over and creasing mechanism;

Fig. 2 is a plan view of the apparatus of Fig. 1, showing, in addition, the fold-over and creasing mechanism;

Fig. 3 is an enlarged view in section on the line 3—3 of Fig. 2.

In these drawings I have considered it necessary to show only the operating tools; that is to say, the tools which operate directly on the strip or on the label, as the case may be, the actuating parts being deemed to be merely a matter of design. For details of these actuating parts, however, reference may be had, if necessary, to the application for patent of Gustave A. Piepenbring and Werner Beutel, filed July 19, 1930, Serial No. 469,016, for "Label cutting and folding machine," this application illustrating and describing a suitable apparatus for feeding the label strip and cutting, folding, and packing the individual labels.

Referring to Figs. 1 and 2, the label strip I may be of the type adapted to be fed by engagement with loops 2 of a suitable reciprocating finger, all as described in the application above referred to and which will hereinafter be described with sufficient detail for purposes of the present application. The strip is drawn from any suitable source of supply, such as a reel (not shown), and thence through tensioning rolls 3, which serve to create a slight drag against the feeding finger above referred to. The strip, which is traveling in the direction of the arrow (see Fig. 1) then passes through aperture 4 in a steam chamber 5, and thence out through aperture 6 to the feeding mechanism. The steam chamber 5 is connected with a suitable source of supply of saturated steam such as the pipe 7 which is provided with a trap 8 for condensation discharge. The steam, which is preferably at low pressure, is permitted to enter into the pipe at the opening 9 and thence flow into the steam chamber. As the steam condenses, the water runs back through the pipe 9 down into the trap 8 and thence to any desired point of discharge.

If there is no steam line from which steam may be conveniently taken, an apparatus comprising the boiler 10 connecting with the water supply tank 11 by the pipe 12 may be used. The boiler 10 leads through the pipe 13 into the steam chamber 5, and the supply tank 11 is provided with an overflow pipe 14 and an inlet pipe 15. The boiler 10 may be heated by any source of heat such as a gas flame 16. Water is allowed to drip into the tank 11 through the pipe 15, and thus the water supply in the boiler 10 is constantly replenished. In order to keep the water level constant in the boiler 10, it is preferable that the inflow of water through the pipe 15 be slightly in excess of the consumption of water in the boiler.

The feeding of the label strip is effected by the reciprocating motion of the finger 17 slidably and rotarily mounted in the bearings 18. Sliding motion is effected by a forked lever arm 19 cooperating with the lug 20 on the finger and reciprocal rotary motion is caused by the crank 21 operated by the crank rod 22. The lever 19 and

crank rod 22 are actuated by cams in the usual manner, the cams being formed to produce a reciprocating motion of the finger and also a slight rotary motion timed to cause the hook 17*a* at the end of the finger to seize a loop at the beginning of each stroke and to feed the label strip to the right, as viewed in Fig. 2, one label length for each stroke, and then to release it.

As the hook on the finger 17 disengages from a loop at the completion of its feeding stroke, the knife 23 slidably mounted in the bracket 24 is caused to descend and to cut off the label which has been projected across the cutting edge of the lower knife 25 and also across the feeding fingers 26 and 27 hereinafter more particularly described. The descent of the knife is accomplished by the bell crank lever 28 pivoted at 29 and having a pin and slot connection with the upper knife as indicated at 30. A reciprocating motion of the proper stroke and of proper timing is given to bell crank 28 by means of cam connection not shown.

As a label lying across the fingers 26 and 27 is cut off, the finger 26 closes down on the finger 27, gripping the cut-off label between them. The descent of the upper finger is accomplished by a slide 31 having pin and slot connection with the finger, as indicated at 32. The slide is, of course, caused to reciprocate vertically a suitable distance and in proper timing to seize the label at or before the time of its severance from the strip.

The cut-off label being grasped between the two fingers, the two fingers as a unit are caused to move to the left, as seen in Fig. 3, and, as they advance, the free ends of the label are passed through the folders 33, which are of well-known construction and which cause the free ends of the label to fold over on the label itself but without making a set crease. As the motion of the finger is continued to the left, each folded over end of the label is subjected to the action of vibrating hammers 34 operating against anvils 35. The vibrations of the hammers 34 are rapid enough so that there is no drag against the fingers as they move along.

After passing between the vibrating hammers, the now creased label, still being gripped by the fingers, is subjected to the action of the pressing units 36 and 37, which are mounted to slide vertically and caused to reciprocate in a vertical direction by connection with the arms 38 and 39 actuated by mechanism of ordinary design (not shown). The movements of the pressing units and of the fingers are, of course, so timed by means of the actuating cams (not shown) that the fingers dwell momentarily while the pressing units are operating on the label. After the label is released from the pressing units, the fingers move slightly further to the left until the edges of the label are seized by the continuously rotating sets of rollers indicated at 40*a* and 41*a*, whereupon the label is carried by these rollers to the place where it is to be deposited.

In the foregoing description of the feeding, cutting, and folding mechanism, I have traced the action of the machine on a single label. It is to be understood, of course, that the action of all of the tools and parts are properly co-ordinated to take care of labels as fast as they are cut by the cutting mechanism.

The label strip may be slightly starched before passing through the steam chamber. While some rigidity is thereby imparted to the strip, this rigidity is reduced by the action of the steam, and the label thereby acquires some additional weight and a sufficient degree of flexibility to permit it to lie flat of its own weight. The advantages which thus arise out of the steaming of the strip accompany all of the operations on the strip and on the individual labels as they are cut off, folded, creased, and delivered. For example, in the case of the cutting-off operation, the label strip lies flat and straight on the lower cutting knife so that all labels are cut off at a substantially uniform length. The action in the folders is also much improved since the folded-over ends tend to maintain their folded shape until they can be subjected to the action of the vibrating hammers. The pressing is also much improved by reason of the somewhat damp condition of the label when subjected to the heat and pressure of the pressing units.

Having thus described the illustrated embodiments of my invention and having in mind that variations and modifications of the same may be made which will not depart from the scope of the invention, I define the scope of the invention by the following claims:

I claim:

1. Apparatus for producing individual labels of textile fabric having folded opposite edges, comprising a steam chamber, a source of supply of steam for said chamber, feeding mechanism for feeding said strip through said steam chamber and to a cutting mechanism, means for cutting off individual labels, means for folding opposite edges of said labels, and means for creasing the folded labels, all of said means being timed to operate on each individual label while still damp from the effects of said steam.

2. In combination, a label feeding, cutting, folding, and creasing mechanism, a steam chamber positioned in advance of the feeding mechanism and provided with apertures through which a continuous strip of labels may be drawn, whereby the said strip may be subjected to the action of steam contained in said chamber, said feeding mechanism comprising means for pushing a free end of the strip past the cutting mechanism to be severed thereby.

3. The process of producing individual labels from a continuous strip of slightly starched textile fabric that is slightly warped, which consists in subjecting the strip to saturated steam to dampen the same, intermittently pushing the dampened strip forward so that at each advance a free end of the strip wil project a label's length past a severing point, and severing such projecting portion from the strip at said point after each advance.

4. The process of producing individual labels having folded opposite ends, which consists in subjecting a continuous strip of slightly starched textile fabric that is slightly warped to saturated steam to dampen the same, intermittently pushing the dampened strip forward so that at each advance a free end of the strip will project a label's length past a severing point, severing the strip at said point after each advance, and folding and creasing the opposite ends of each severed portion while still in a damp condition.

GUSTAVE A. PIEPENBRING.