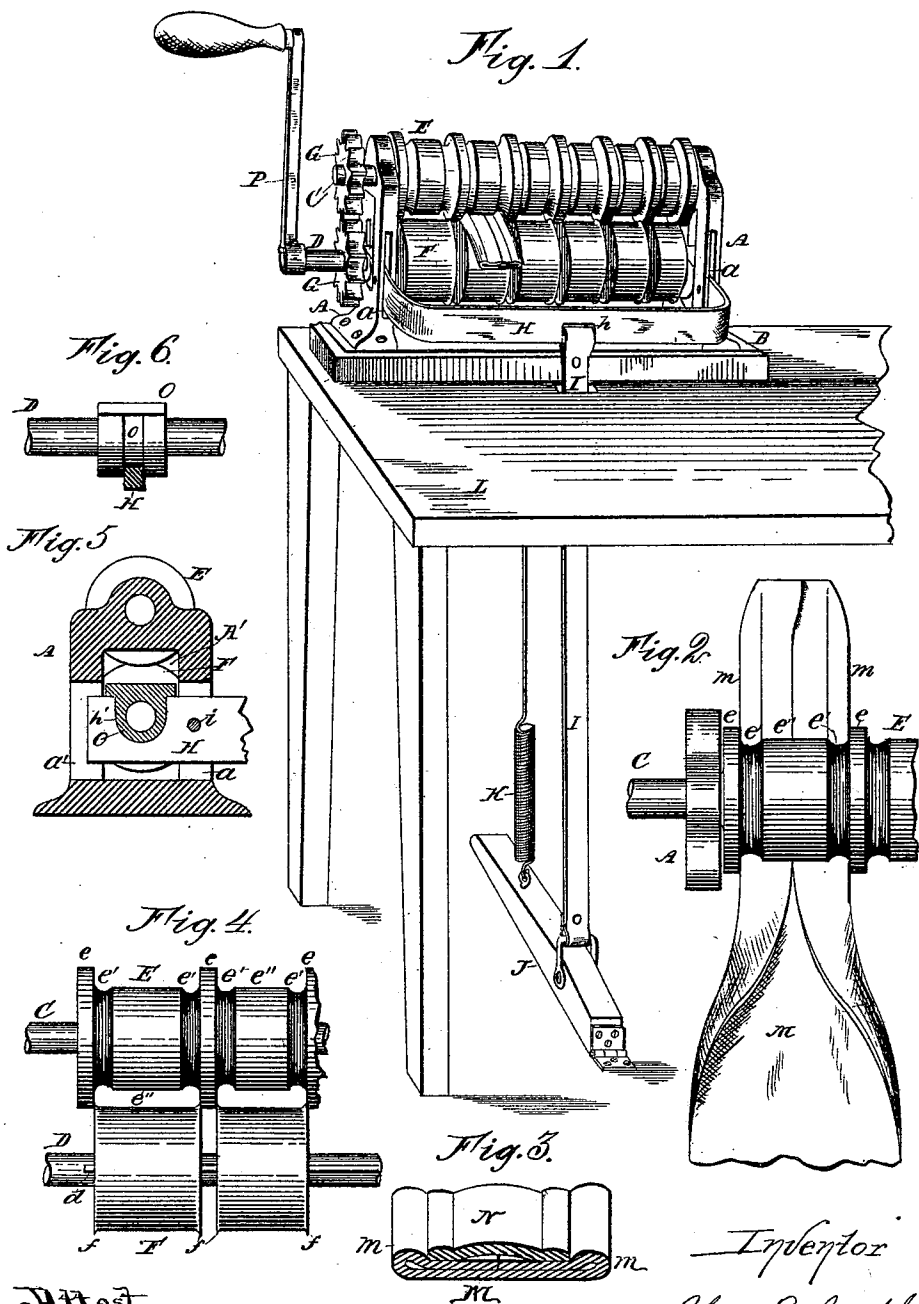


(No Model.)

A. B. ARNOLD.
LEATHER FOLDING MACHINE.

No. 544,399.

Patented Aug. 13, 1895.



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UNITED STATES PATENT OFFICE.

ALONZO B. ARNOLD, OF LE GRAND, IOWA, ASSIGNOR OF ONE-HALF TO
D. M. HELFENSTINE, OF SAME PLACE.

LEATHER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 544,399, dated August 13, 1895.

Application filed September 4, 1894. Serial No. 521,986. (No model.)

To all whom it may concern:

Be it known that I, ALONZO B. ARNOLD, a citizen of the United States, residing at Le Grand, in the county of Marshall and State of Iowa, have invented certain new and useful Improvements in Leather-Folding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines used for folding leather strips in the manufacture of breast-collars, breeching, and other parts of harness; and the invention consists in the construction, combination, and arrangement of parts, as hereinafter fully described and claimed.

The object of the invention is to produce a machine capable of forming the "fold" quickly and perfectly, with rounded or beaded edges, and with a depressed center between the beads to receive the "layer."

Hitherto in the manufacture of the parts of a harness technically known as "folds" it has been customary to turn the edges of the strip inwardly by hand. This is necessarily a slow and laborious operation, particularly as it is not possible to fold the strip so sharply as to make it hold a closely-folded position, but basting of the edges to the middle of the strip is required to hold the parts in proper position for sewing. Much care and labor are also required in forming the bead at each side of the fold, it being desirable that the sides of the fold should rise somewhat higher than the middle portion thereof, so as to form a seat or recess for the "layer," so called, the supplemental strip covering the joined edges of the fold. To give a suitable roundness to the sides of the fold it has been common to fold with the leather a strip of stout canvas, burlaps, oilcloth, or the like, which are of no material benefit except for this purpose. In addition to this it has been common to strike up the bead alongside the layer, after the latter has been sewed in place, by means of a suitable hand-tool drawn forcibly along the folded side. Even with the utmost skill and patience it is hardly possible to make a perfectly-uniform fold by hand. It is said further, that in addition to the means already

described for raising the bead it is customary to draw a piece of candle-wick or the like into this part of the fold after sewing by means of a long wire looped at one end. It is the purpose of this invention to obviate these difficulties and produce a perfectly-uniform strongly-beaded fold, compactly molded for sewing, and much more rapidly than is possible by hand.

Referring now to the drawings, forming a part of this specification, Figure 1 is a rear view in perspective of a machine embodying my invention. Fig. 2 is a fragmentary plan view showing the manner of making the fold. Fig. 3 shows the fold as finished with the layer attached or in position for attachment. Fig. 4 is a fragmentary front or rear elevation of the rolls which form the fold. Fig. 5 is a transverse section in the plane of the center of one of the roll-supporting standards. Fig. 6 is a fragmentary front or rear elevation showing the manner of mounting the bearing for the lower roll.

Similar letters of reference indicate corresponding parts.

In suitable standards A A, mounted on a base B, is mounted a pair of rolls E and F, having shafts C and D, respectively, provided with gears G G. One of the shafts is extended and provided with a crank P. A pulley may take the place of the crank when other than hand-power is to be employed. One of the rolls is adjustably mounted with respect to the other, so as to be moved toward it by foot-power, as will be hereinafter more particularly set forth.

In the upper part of each standard is a suitable hole forming a bearing for each end of the shaft C. Below this is an opening A' in the standard large enough to receive a box O, one of which is mounted in each standard on a bail H, pivoted to the standards at i. The terminal portions of the bail, which are parallel, pass through slots a a in the back sides of the standards and into slots a' a' in the front sides of the same, whereby these parts of the bail have a limited vertical movement, but are restrained from lateral movement. The boxes O O, which are provided on the under side with suitable grooves o o, are mounted in semicircular notches h' h' formed in the upper sides of the bail. The boxes are

thus held from lateral displacement on the bail, and thereby from such displacement in the machine. In a suitable slot *h* in the middle of the bail is connected a strap *I*, which at the lower end connects with a foot-lever *J*, which is provided with a suitable lifting-spring *K*. The roll *F* and its connections are heavy enough to overbalance the outer portion of the bail and its connected strap, and thus drops to normal position of its own gravity.

The roll *E* is divided into a number of grooved spaces corresponding in width to the different sizes of fold desired. Each fold-former of this roll consists of the side flanges *e e*, adjacent grooves *e' e'*, and an intermediate raised flat portion *e''*. These grooves *e' e'* permit the folded sides of the strip to rise above the level of the middle portion, which is of a proper width for the layer, and thus form prominent beads each side thereof, as is desirable in this class of work. The lower roll consists of a series of spools or collars *F F*, of lengths corresponding to the width of the spaces between the flanges of the upper roll. These, for convenience of removal, are separately and loosely mounted on the shaft *D*, which is provided with a suitable spline *d* to prevent their turning. These collars might be made perfectly cylindrical; but in such a case the under side of the fold would have a more or less sharply-defined angle near the side, which would be objectionable, as tending to chafe the horse wearing the harness. To secure the proper roundness on the under side, therefore, the collars are formed with an upturned terminal lip *f* at each end, as clearly shown in Fig. 4.

In practice I have found that both rolls may be made of wood, hard maple, or the like, close-grained material being preferred. Either or both rolls may be made of metal, however, if found desirable.

The operation of the machine is illustrated in Fig. 2. The strip for the fold is first brought to a "finish" at one or both ends, as is customary. This folded and reduced end is then inserted in the proper space between the rolls. Pressure is brought to bear upon it by means of the foot-lever. The strip being then guided by one hand, or otherwise, it is passed through between the rolls by turning the crank, and comes out symmetrically folded and compactly molded to the proper form and position for sewing.

It is to be noted that the construction of the rolls is such that the same pressure which reduces the thickness of the fold *M* in the middle, where it is desirable that it should be so reduced to make a recess for the layer *N*, also tends to full up and thicken the portions forming the beads *m m*, so that they stand up

prominently and keep their proper shape without any filling whatever.

In practice it has been found that foot-pressure is much more satisfactory than a positive adjustment of the rolls, as the thickness and quality of leather are apt to vary greatly, and the pressure should be adapted to these variations to a greater or less extent.

I am well aware that machines for creasing leather and possessing some of the characteristics of my invention are in common use, having operated them for years in my business as harness-maker. It is to be noted, however, that these machines are specially adapted for operating upon a single thickness of hard leather and simply for the purpose of ornamenting the surface thereof, or of marking a stitching-line thereon, or the like. Their construction is such that without special change and adaptation it is impracticable to use them as folding-machines, since the conformation of the beads and grooves is such as to produce results of no value to a harness-maker. As heretofore stated, the desideratum is to fold the leather and form a strong bead or welt at the folded sides. This is impossible with any machine known to me other than my own, and this is effected by forming the flanged roll with a single simple groove next to the flange and adjoining the cylindrical central part of the roll. This construction and the results attained by it are, so far as I am aware, entirely new.

Having thus described my invention, I claim—

1. In a leather-folding machine, the combination of a flanged roll, having a cylindrical portion of smaller diameter than the flanges and between said flanges, and grooves between said cylindrical portion and said flanges, and a roll corresponding in length to the space between said flanges, and provided with an upturned lip at each end, with means substantially as described for retaining, adjusting and actuating said rolls.

2. In a leather folding machine, the combination of the splined shaft *D d* and a series of collars *F F* of varying width, having terminal lips *f f* at each end, whereby they are adapted to form the under side of the fold with suitably rounded edges, and a roll substantially as described, that is to say, having a central, cylindrical portion, terminal flanges, and intermediate grooves, and adapted to fold the strip inwardly at each side and form a seat for the layer, with a bead each side.

In testimony whereof I affix my signature in presence of two witnesses.

ALONZO B. ARNOLD.

Witnesses:

P. J. FERGUSON,
CORWIN O'NEAL.