Aug. 25, 1936. F. EBERT 2,052,222

FOLDING ATTACHMENT FOR SEWING MACHINES

Filed Feb. 26, 1934 3 Sheets-Sheet 1

Fig. 1.

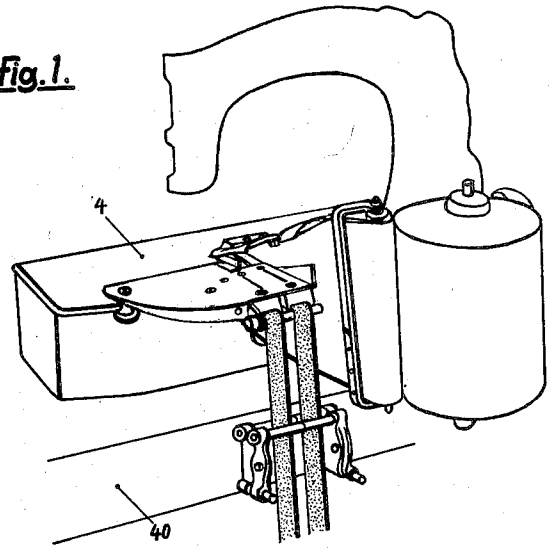


Fig. 11.

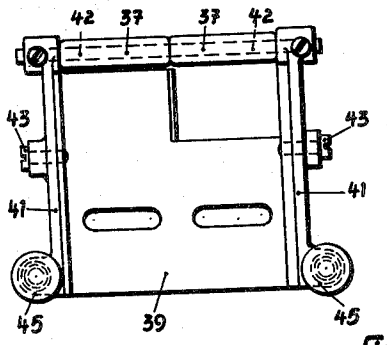


Fig. 10.

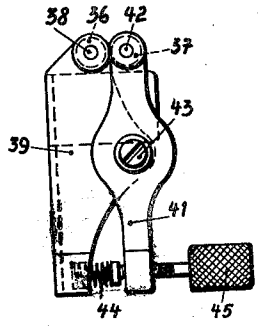
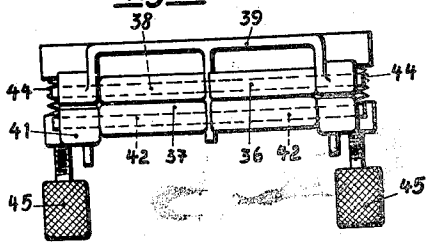


Fig. 9.



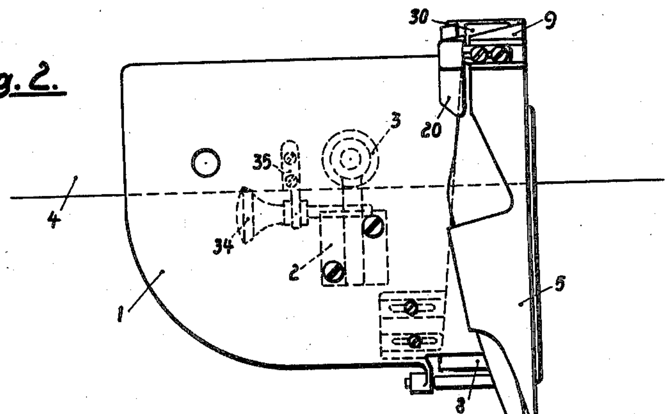
Inventor:
Fritz Ebert
By Lewis Pierce
Attorney.

Aug. 25, 1936. F. EBERT 2,052,222

FOLDING ATTACHMENT FOR SEWING MACHINES

Filed Feb. 26, 1934 3 Sheets-Sheet 2

Fig. 2.



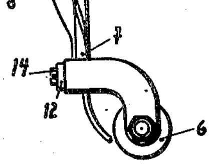


Fig. 4.

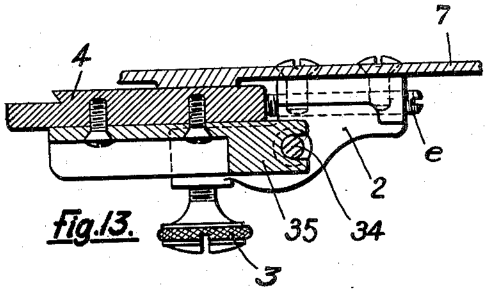
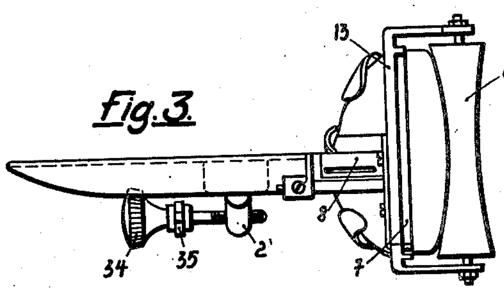
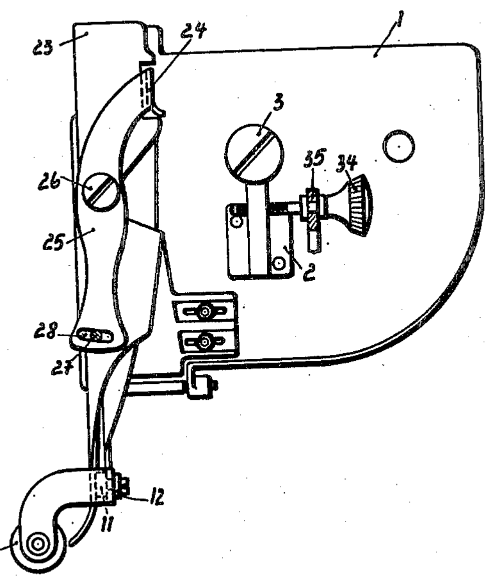


Fig. 13.

Fig. 3.





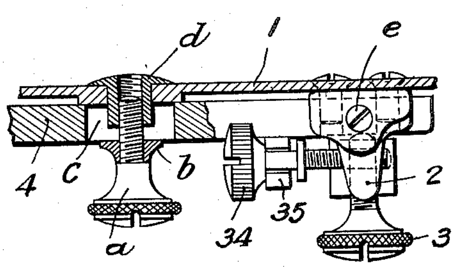


Fig. 12.

Inventor:
Fritz Ebert
By [signature]
Attorney

Aug. 25, 1936. F. EBERT 2,052,222

FOLDING ATTACHMENT FOR SEWING MACHINES

Filed Feb. 26, 1934 3 Sheets-Sheet 3

Fig. 5.

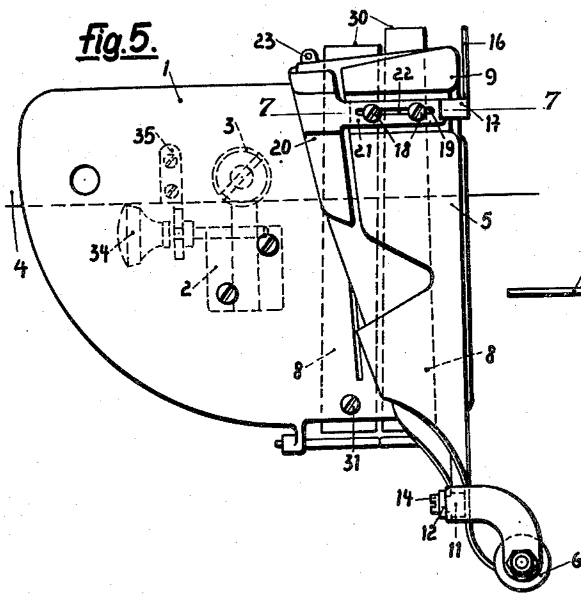


Fig. 6.

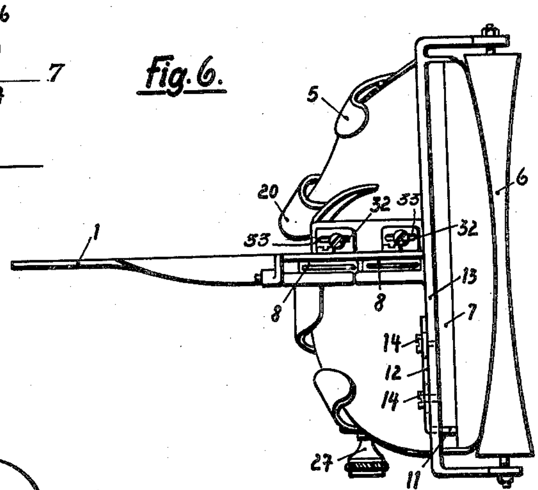


Fig. 8.

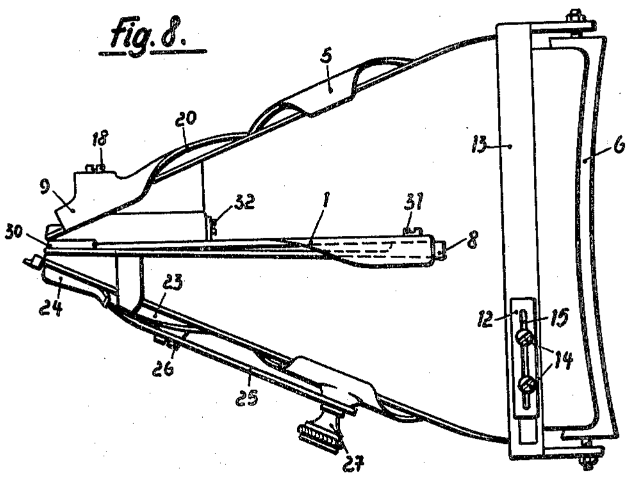
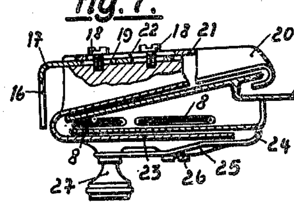


Fig. 7.



Inventor:

Fritz Ebert

By [illegible]

Attorney.

Patented Aug. 25, 1936 2,052,222

UNITED STATES PATENT OFFICE

2,052,222

FOLDING ATTACHMENT FOR SEWING MACHINES

Fritz Ebert, Oberndorf-on-the-Neckar, Germany

Application February 26, 1934, Serial No. 713,036
In Germany March 1, 1933

7 Claims. (Cl. 112—141)

This invention relates to a fabric folding device with a rubber band guide for sewing machines for producing fabric enclosed elastic bands.

The folding device according to the invention is capable of handling material of different kinds, and for this purpose possesses adjustable parts, such as the fabric guide, which is adjustable as to width at the feeding (inlet) point in order to take care of different thicknesses of enclosed elastic requiring corresponding widths of the fabric.

The outlet of the folding device has a tongue which is adjustable transversely to the fabric feed to press the outer fabric edge more or less against the rubber edge or to prevent the fabric after coming out of the folding device from moving sidewards away from the rubber edge. The adjustable tongue makes it possible to sew the rubber band in the folded fabric in this position.

The device has an upper folding plate which is also laterally adjustable, transversely to the fabric feed, and consists for this purpose of two parts. This adjustment is advantageous, as materials of different kinds will fold in different ways while the needle distance always remains the same. In addition to the adjustability of the upper folding plate, adjustability of the width of fold during discharge is insured also by the provision of a movable edge guide which extends into the lower folding plate and can be adjusted therein corresponding to the adjustment of the upper plate.

The rubber band guides are adjustable also and permit lateral adjustment of their outlets so as to vary the position of the rubber bands laterally relative to one another and to the fabric fold.

Furthermore, the entire folding device can be accurately adjusted transversely to the feed path of work in which the fabric covered band is being sewed and thus to the needles of the sewing machine.

Finally, a brake is provided for the rubber bands to regulate separately at will the pull of each band so as to impart for instance greater tension to the outer band than to the inner band when two rubber bands are used and thus to insure good fitting of the garment.

By way of example, two embodiments of the invention are illustrated in the accompanying drawings, in which Figs. 2 to 4 refer to the production of bands with one elastic and Figs. 1 and 5 to 11 refer to the production with two elastics.

Figure 1 is a diagrammatic view of a sewing machine provided with a folder for two rubber bands, with the non-essential parts omitted; Figs. 2, 3 and 4 are, respectively, a top view, front view and bottom view of a folding device for one elastic; Figs. 5 and 6 are, respectively, a top and front view of a folding device for two elastics; Fig. 7 is a vertical cross section taken on line 7—7 of Fig. 5 and Fig. 8 a side view of a folding device for two elastics; Figs. 9, 10 and 11 are, respectively, a top, side and front view of the rubber band brake; and Figs. 12 and 13 are side views partly in section of the adjusting means for the folding device.

The folding device itself is known, and is removably secured to the top 4 of the sewing machine, in front of the stitch-forming members thereof which are not shown, by means of the plate 1, the claw 2 on the under side and the screw 3, as shown in Fig. 1.

The folding device further comprises the fabric guide 5 which is entered by the band fabric passed over a vertical roller 6 through the vertical slit 7. The elastic moves in a guide 8 through the device, and the material comes out of the device folded and with the elastic inserted therein at the rear end 9. Figs. 5 and 7 show two guides arranged side by side for supplying two elastics.

According to the invention, the same device can be used for working different kinds of material. To render this possible, the height of the vertical inlet 7 is adjustable as for instance in the two elastic type shown in Figs. 5 to 8, and particularly Figs. 6 and 8, the adjustment being effected by the adjustable limiting wall 11 which is the lower one in the construction shown and which forms here the one side of an angle whose other side 12 rests on the vertical ledge 13 in front of the folding device and can be adjusted by the screws 14 in the longitudinal slot 15.

Furthermore, the tongue 16 at the outlet 9 is laterally adjustable, i. e., transversely to the fabric feed, as indicated in Figs. 5 to 8, and particularly Figs. 5 and 7. It thus forms for this purpose one side of an angle whose other angle 17 lies on the outlet end 9 and is adjustable thereon by means of the screws 18 and slots 19.

The tongue 16 has for its purpose to press the folded fabric against the outer edge of the rubber so that there will be no space between the rubber and the fabric in the lateral direction. Since different kinds of fabric will behave differently, this tongue is made adjustable.

The upper folding plate 20 is also laterally, i. e., transversely to the fabric feed, adjustable and consists of two parts. The separated part 20 is

fitted with a ledge-like projection 21 and is fixed by the screws 18 of the stop tongue 16, which pass through a longitudinal slot 22 of the projection 21 under the side 17 of the tongue 16.

According to the adjustment of the upper folding plate 20, a stop 24 can be moved into the lower folding plate 23 to regulate the outlet width and bring it into agreement with the adjustment of the upper folding plate 20. In the construction shown the stop 24 forms a ledge at the end of a lever 25 rotating on the underside of the folding device about a pin 26 and capable of being fixed at the other end by means of the screw 27 and a longitudinal slot 28 curved about the fulcrum 26.

In the two band type shown, the rubber band guides 8 are further adjustable relative to one another and the fold, so that their outlets 30 can be laterally displaced to displace the rubber bands. For this purpose, the guides 8 are movable at the front end about the pins 31. In their adjusted position, they are held by the screws 32 and longitudinal slots 33 and can thus be individually adjusted.

In addition, the entire folding device can be accurately adjusted laterally, i. e., transversely to the fabric feed, and also to the needles, by means of a set screw 34 loosely rotatable yet axially held in a fork 35 extending from the top 4 of the machine, and screwing into the claw 2 serving for fastening the folding device.

This is shown in greater detail in Figures 12 and 13, wherein the fork member 35 is shown screwed to the machine table plate 4, in which a cylindrical part of the adjusting screw 34 engages to permit the apparatus to be exactly adjusted transversely to the needle. In the table plate 4 there is provided a longitudinal slot *c* in which a nut *d* having two flat faces is movable, this nut extending through the plate 1 of the folder apparatus. By means of this nut *d*, and the washer *b*, the plate 1 is clamped to the table 4. The screw 3 also bears on the under side of the table whereby the apparatus when it has been adjusted is firmly fixed on the table 4. By means of the screw *e* the apparatus can be given a fine adjustment in the direction of feed since this screw bears against the front end of the table plate 4.

To regulate the tension of the elastics during or before entering the folding device, a brake as shown in Figs. 9 to 11 is provided and constructed so that the tension of each elastic can be regulated separately.

The brake consists substantially for each elastic of a pair of rolls 36, 37, the rolls of each pair being resiliently pressed against one another and thus act like a brake on the elastic passing between them.

The fixed rolls 36 are arranged on a joint shaft 38 in a bracket 39 screwed to the working table 40 below the folding device. The movable rolls 37 are disposed at the end of the two-armed levers 41 on the overhung shafts 42 and rotate about the pins 43, there being a shaft 42 connected to each lever 41 for each roll 37. They are under the action of the springs 44 which resiliently press them against the stationary rolls 36. To permit special tensioning of each band, the power of each spring 44 is separately regulatable, for which purpose the springs 44 supported by the bracket 39 press against axially adjustable abutments in the form of set screws 45 which can be separately adjusted to permit individual tensioning of each elastic before it is sewn in.

I claim:—

1. An attachment device for sewing machines for folding fabric about elastic strip material to form a fabric enclosed elastic band, comprising a fabric folder with upper and lower guide plates converging to an outlet for the folded fabric, means for guiding elastic strip material into the fold in the fabric issuing from said outlet, and a tongue extending forwardly from the fold side of the outlet and adjustable transversely to the travel of the folded fabric issuing from said outlet.

2. An attachment device for sewing machines for folding fabric about elastic strip material to form a fabric enclosed elastic band, comprising a fabric folder with upper and lower guide plates converging to an outlet for the folded fabric; means for guiding elastic strip material into the fold in the fabric issuing from said outlet, one of said guide plates being divided substantially parallel to the fold and the divided portion remote from the fold being adjustable laterally with respect to the fold; and means on the other guide plate for varying the effective width of the outlet end thereof, said last-named means comprising a lever pivoted to the guide plate, a screw for fixing the lever in position, and a stop on the lever constituting a side wall engaging the edge of the fabric guided by said guide plate.

3. A device according to claim 2, in which the fabric engaging stop is a flange integrally formed on the lever.

4. An attachment device for sewing machines for folding fabric about elastic strip material to form a fabric enclosed elastic band, comprising a fabric folder with upper and lower guide plates converging to an outlet for the folded fabric, means laterally adjustable in the said outlet for guiding elastic strip into the fold in the fabric issuing from said outlet, adjusting devices capable of being set in different positions for varying the effective width of the fabric outlet, and a plurality of elastic strip guides pivotally connected to the folder at their inlet ends and having means near their outlet ends enabling said ends to be adjusted laterally in the outlet for the folded fabric.

5. An attachment device for sewing machines for folding fabric about elastic strip material to form a fabric enclosed elastic band comprising a table plate with means for its attachment to the sewing machine in operative position with respect to the needle thereof, a fabric folder with upper and lower guide plates converging to an outlet for the folded fabric, said folder being attached to the table plate, means for guiding an elastic strip material into the fold in the fabric issuing from said outlet, adjusting devices capable of being set in different positions for varying the effective width of said guide plates, and means for adjusting the entire device transversely to the feed path of the work through the sewing machine, said means comprising a clamp on the under side of the table plate and a set screw extending axially of the clamp and cooperating with an edge of the machine part to which the table plate is attached.

6. An attachment device for sewing machines for folding fabric about elastic strip material to form a fabric enclosed elastic band, comprising a fabric folder with upper and lower guide plates converging to an outlet for the folded fabric, means for guiding elastic strips into the fold in the fabric issuing from said outlet, adjusting devices capable of being set in different positions for varying the effective width of said outlet,

separate brake means operative on said strips near their entry into the guide means, and means for separately regulating the braking action of each brake.

7. An attachment device for sewing machines for folding fabric about elastic strip material to form a fabric enclosed elastic band, comprising a fabric folder with upper and lower guide plates converging to an outlet for the folded fabric, means for guiding elastic strips into the fold in the fabric issuing from said outlet, adjusting devices capable of being set in different positions for varying the effective width of said outlet, and a brake for each strip comprising stationary and adjustable rolls between which the strips pass on their way to the guide means, a common shaft for the stationary rolls, levers carrying the adjustable rolls separately and floatingly at one end, springs acting on the other ends of said levers, and set screws acting as abutments for the springs.

FRITZ EBERT.