May 10, 1932. J. MONFORTS ET AL 1,857,735

FABRIC DOUBLING MACHINE

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Fig. 1.

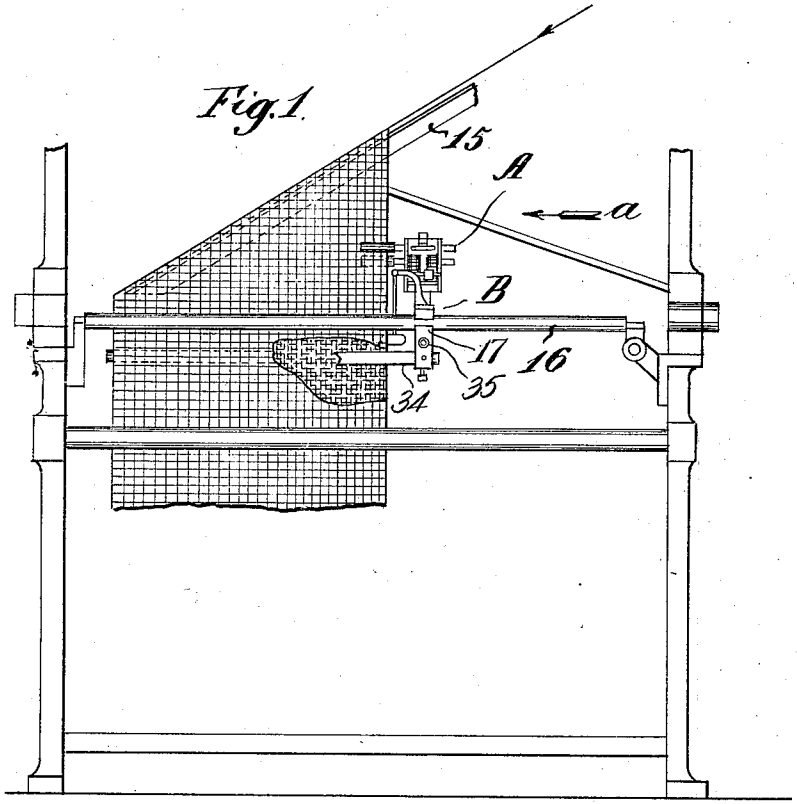
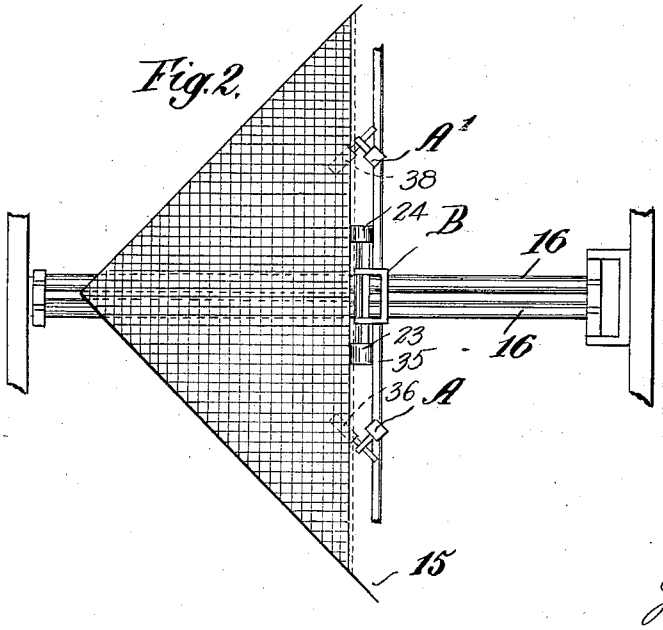


Fig. 2.



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FABRIC DOUBLING MACHINE

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Fig. 3.

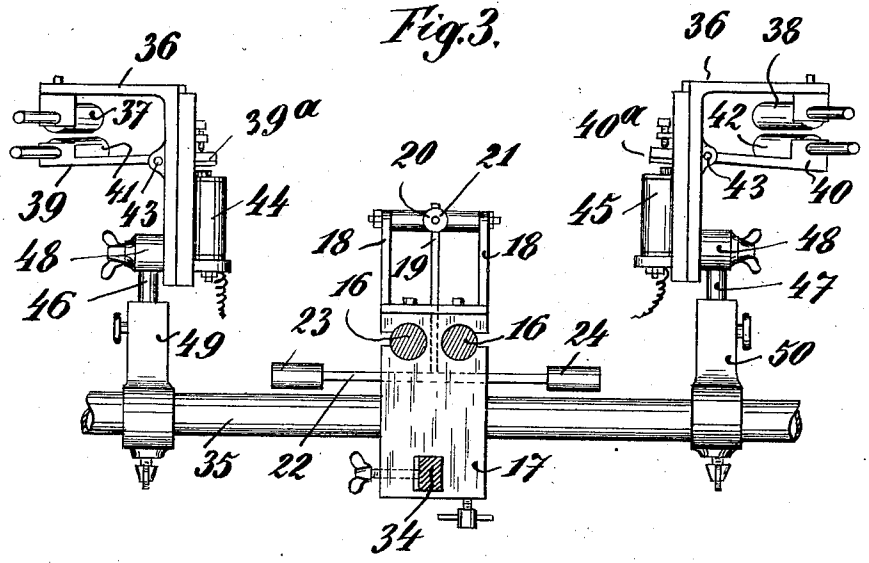
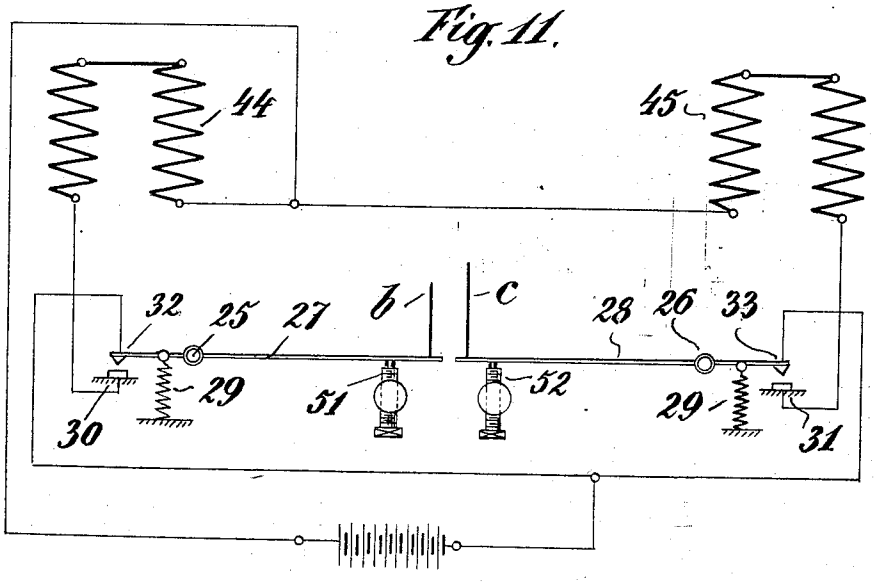


Fig. 11.



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FABRIC DOUBLING MACHINE

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Fig.4.

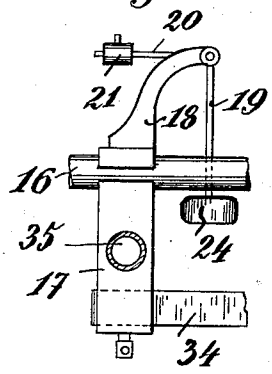


Fig.5.

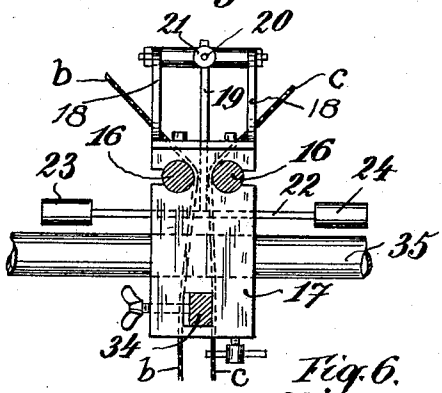


Fig.6.

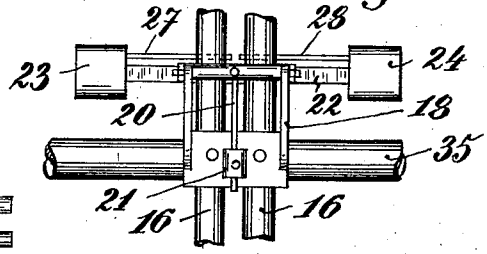


Fig.8.

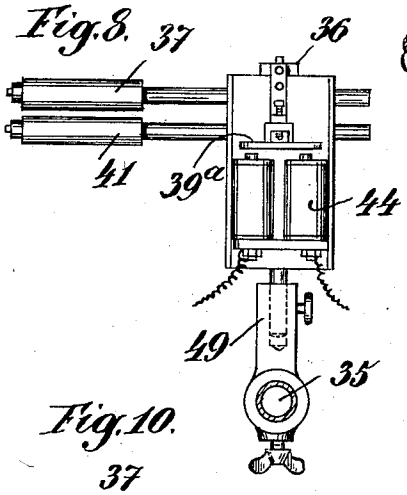


Fig.7

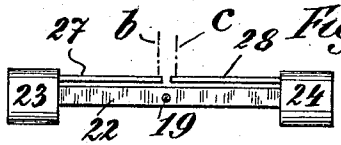


Fig.9.

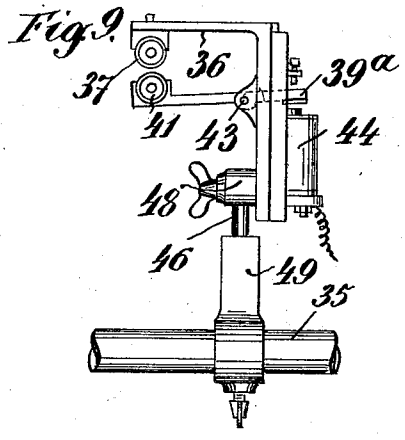
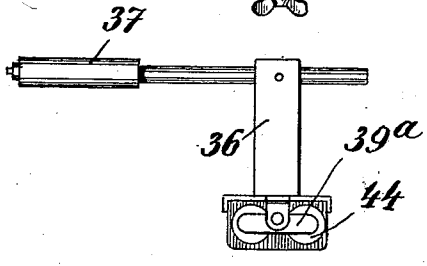


Fig.10.



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FABRIC DOUBLING MACHINE

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Fig. 12.

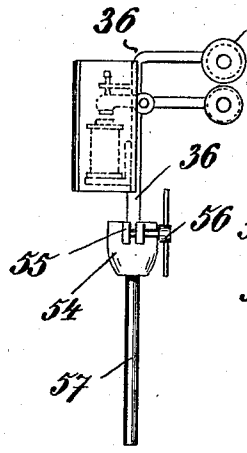


Fig. 13.

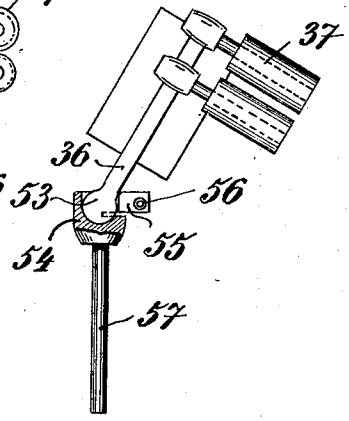
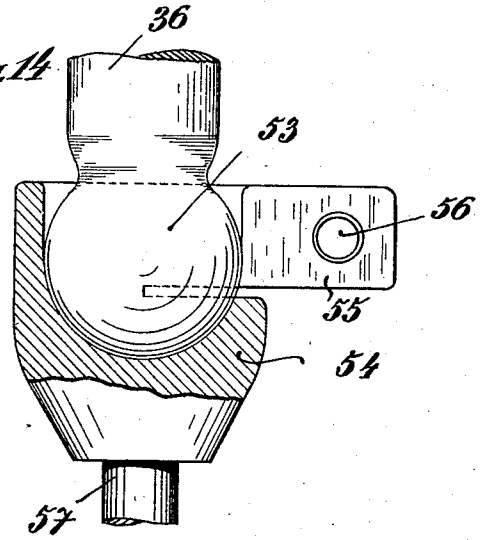


Fig. 14.



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UNITED STATES PATENT OFFICE

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FABRIC DOUBLING MACHINE

Application filed January 3, 1930, Serial No. 418,368, and in Germany July 23, 1929.

In the endeavours hitherto made to regulate automatically by electro-magnetic means the run of the fabric or web edges in doubling machines, various difficulties have been encountered, inasmuch as the exposed electric contact parts are liable to become soiled by the fabric dressing, and the weight of the guide rods to be moved is relatively large, so that very substantial electro-magnetic forces are required for their movement, and the momentum which they acquire is inconvenient. Moreover the construction is complicated and its manufacture is expensive.

According to our invention the guide bars through which the doubled fabric runs are not, as heretofore, adjustable, but an arrangement is made whereby in case of wrong run of the fabric edges, correction is made by means of lateral guide rollers, such as are already in use in edge-guide devices. These guide rollers are of no great weight and can therefore easily be actuated by electro-magnetic means. The electro-magnets are switched on and off by a swinging feeler, which always follows up the fabric edges automatically, also when the width of fabric changes by a small amount, by reason of the various treatments to which it is subjected, especially in dressing and drying machines.

The annexed drawings illustrate in Figs. 1 and 2 part of the improved doubling machines, in side elevation and in plan view respectively.

The guide rollers with their electro-magnets are indicated in these figures by A, A^1, and the fabric edge feeler by B.

The remaining figures illustrate an example of the feeler and guide device,

Fig. 3 showing the guide rollers with electro-magnets and their adjusting device, and also the feeler device seen in the direction of the arrow *a* in Fig. 1.

Figs. 4 to 7 illustrate the feeler device in various views.

Fig. 4 is a side view thereof.

Fig. 5 is an end view looking from left to right of Fig. 4, corresponding to the showing of the assembly in Fig. 3.

Fig. 6 is a top view of the feeler device.

Fig. 7 is a top view of a detailed portion of Fig. 6.

Figs. 8 to 10 show a pair of guide rollers with magnets.

Fig. 8 is a side view thereof.

Fig. 9 is an end view looking from left to right of Fig. 8, corresponding to the showing of the assembly in Fig. 3.

Fig. 10 is a top view of a detailed portion of Fig. 6.

Fig. 11 shows the electrical circuits controlled by the feeler levers 27, 28 cooperating with the edges of the doubled web or fabric.

Figs. 12 and 13 are two views of a modified construction of the guide roller fixing arrangement, and

Fig. 14 shows a detail on a larger scale.

In Fig. 1, 15 is the usual triangular doubling table, and 16 represents the guide or folding rods fixed in the machine frame. On these guide rods 16, the feeler device B is adjustably arranged, so that it can be shifted and fixed according to the width of the fabric. It consists of a body 17 which can be clamped on these guide rods, which body carries on two arms 18, the swinging feeler. The latter consists of an angular arm 19, 20. On the part 20 a weight 21 is slidably arranged, and the part 19 carries a rail or crossbar 22 which is provided at its ends with protective housings 23 and 24 respectively. On the rail, inside these protective housings, there are provided joints 25 and 26 respectively (see Fig. 11) about which joints the feeler levers 27, 28 swing, which with their inner ends come so closely towards each other that they leave a small clearance but are with certainty touched by the fabric edges *b*, *c* (see Fig. 7). The feeler levers are, inside the housings, each under the action of a spring 29, and are provided with contacts 32 and 33 respectively (see Fig. 11) which contact parts cooperate with stationary contact parts 30, 31, arranged in the housings. The weight 21 is so adjusted that the feeler device gently comes to lie against the fabric edges *b*, *c*, so that by this means the contacts 30, 32 and 31, 33 are kept apart from each other.

In the body 17 there is beneath the two rods 16 a wedge 34 parallel with them, which

serves the purpose of keeping the fabric edges *b*, *c*, apart from each other so that they encounter with certainty the feelers 27, 28, and there is also a rod 35 having on its ends the edge guide rollers with their electro-magnets, as shown in Figs. 3 and 8 to 10. Each pair of rubber guide rollers comprises a rubber roller 37 or 38 rotatable in an arm 36, and a like roller 41 or 42 mounted on a movable carrier 39 or 40. Each of the two carriers 39, 40 swings on its arm 36 about a pivot 43 and serves by its part 39*a* or 40*a* as an armature for the magnet 44 or 45 fixed to the angle arm 36. Each angle arm can rotate on a pin 46, 47 about a joint 48 and is, by means of the said pin, adjustable as to height in a body 49 or 50 fixed on the rod 35, and also rotatable. Each body 49 and 50, however, is in turn slidable and inclinable on the rod 35 so that the guide rollers 37, 41 and 38, 42 can be accurately set and adjusted in any desired position.

Instead of the device just described that illustrated in Figs. 12 to 14 may be employed, in which the arm 36 carrying the upper roller 37 terminates below in a ball 53, which, together with a cup 54 forms a universal joint. By means of a screw 56 pressing together the lugs 55 of the cup 54 the fixing of the joint in the desired position is possible. The pin 57 which carries the cup 54 is fixed on the rod 35 in such a way that it can be adjusted up and down in any required way.

If the fabric edges run correctly then both the contacts 30, 32 and 31, 33 are lifted off because, according to Fig. 4 the entire feeler device is constantly pressed gently against the edges of the fabric by the weight 21. If the width of fabric changes then the feeler device gives way and the contacts continue to be lifted off; both magnets 44 and 45 are deenergized in this case, so that the correctly running fabric edges pass uninfluenced between the two pairs of rollers 37, 41 and 38, 42. As soon as one fabric edge, for example *b*, runs forward, the entire feeler device is pressed back slightly by the forward running edge. The other fabric edge *c* of course goes back relatively to *b*, whereby the feeler lever 28 is brought under the action of the spring 29 because the resistance of the goods *c* has stopped (see Fig. 11), and thus the contacts 31, 33 are closed. By this means the magnets 45 are energized whereby the rollers 38, 42 are pressed against each other and the goods are drawn over to the right until the edge *c* of the goods is drawn so far forward that it pushes the lever 28 forward and thus breaks the contact at 31, 33. In this way the magnetic action of the magnets 45 ceases, the two rollers 38, 42 move apart, and the goods again run free. This operation is repeated according to which edge of the goods remains behind.

In order to ensure that the contacts 31, 33 and 30, 32 cannot be moved too far apart, easily adjustable stops 51, 52 are provided against which the levers 27 and 28 come to lie when both edges *b* and *c* of the goods run uniformly.

It will be obvious that the feeler device mounted on the downwardly directed angle lever 19 can also come to lie against the fabric edges by the action of its own weight or that, instead of a weight 21, a spring may be provided which causes the feeler to lie with gentle pressure against the edges of the fabric or web.

Claims:

1. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to contact with the edges of said doubled web, electrically operated gripping means associated with each web edge in advance of said contact point, and means for controlling said gripping means by said feeler device whereby the coincidence of the web edges is automatically regulated.

2. The combination claimed in claim 1 wherein said gripping means comprises a fixed guide roller, and a cooperating roller mounted upon the armature of an electrically controlled magnet.

3. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to contact with the edges of said doubled web, electrically operated gripping means disposed upon opposite sides of said web adjacent each edge in advance of said contacting point, and means comprising electrical magnets beyond the path of said web for controlling said gripping means by said feeler device whereby the coincidence of the web edges is automatically regulated.

4. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device, mounted upon a support adjustable along said guides in accordance with the width of the doubled web, adapted to contact with the edges of said doubled web, electrically operated gripping means associated with each web edge in advance of said contacting point mounted for universal adjustment also upon said support, and means for controlling said gripping means by said feeler device whereby the coincidence of the web edges is automatically regulated.

5. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to resiliently contact with the edges of said doubled web, electrically operated gripping means associated with each web edge in advance of said contact point, and means for controlling said gripping means by said feeler device respon-

sive to a differential variation between said web edges whereby the coincidence of the edges is automatically regulated.

6. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to contact with the edges of said doubled web comprising a pivoted lever, a crossbar fixed thereto, feeler levers pivotally associated with said crossbar, the inner extremities of said levers each adapted to forcibly contact with one of the web edges, electrical contact points at the outer extremities of said levers, electrical contact points upon said crossbars cooperating with those upon the feeler levers, and gripping means controlled by said contact points in an electrical circuit whereby the coincidence of the web edges is automatically regulated.

7. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to contact with the edges of said doubled web comprising a pivoted angular lever, a crossbar fixed thereto at one end thereof, feeler levers pivotally associated with said crossbar, a weight attached to the other end of said angular lever adapted to force said feeler levers into contact with each of the web edges at the inner extremities of said feeler levers, electrical contact points at the outer extremities of said levers, electrical contact points upon said crossbars cooperating with those upon the feeler levers, and gripping means controlled by said contact points in an electrical circuit whereby the coincidence of the web edges is automatically regulated.

8. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon a support upon said guides adapted to contact with the edges of said doubled web, a separating element adapted to extend between said web edges mounted in said support below said guides to maintain said web edges separated, electrically operated gripping means associated with each web edge in advance of said contacting point, and means for controlling said gripping means by said feeler device whereby the coincidence of the web edges is automatically regulated.

9. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to contact with the edges of said doubled web comprising a pivoted lever, a crossbar fixed thereto, feeler levers pivotally associated with said crossbar, the inner extremities of said levers each adapted to forcibly contact with one of the web edges, electrical contact points at the outer extremities of said levers, electrical contact points upon said crossbars cooperating with those upon the feeler levers, housings disposed upon the extremities of said crossbar adapted to encase said electrical contacts, and gripping means controlled by said contact points in an electrical circuit whereby the coincidence of the web edges is automatically regulated.

10. In combination with a web doubling machine, a plurality of stationary guides for folding the web, a feeler device mounted upon said guides adapted to contact with the edges of said doubled web comprising a pivoted angular lever, a crossbar fixed thereto at one end thereof, feeler levers pivotally associated with said crossbar, a weight attached to the other end of said angular lever adapted to force said feeler levers into contact with each of the web edges at the inner extremities of said feeler levers, electrical contact points at the outer extremities of said levers, electrical contact points upon said crossbars cooperating with those upon the feeler levers, resilient means associated with said electrical contact points, adapted to control their operative positions against the force exerted by the contact of said feeler levers against said web edges, and gripping means controlled by said contact points in an electrical circuit whereby the coincidence of the web edges is automatically regulated.

The foregoing specification signed at Cologne, Germany this 11th day of December, 1928.

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