March 28, 1939. F. M. COLLIER ET AL 2,152,399

CLOTH-FOLDING MACHINE

Original Filed June 7, 1937 2 Sheets-Sheet 1

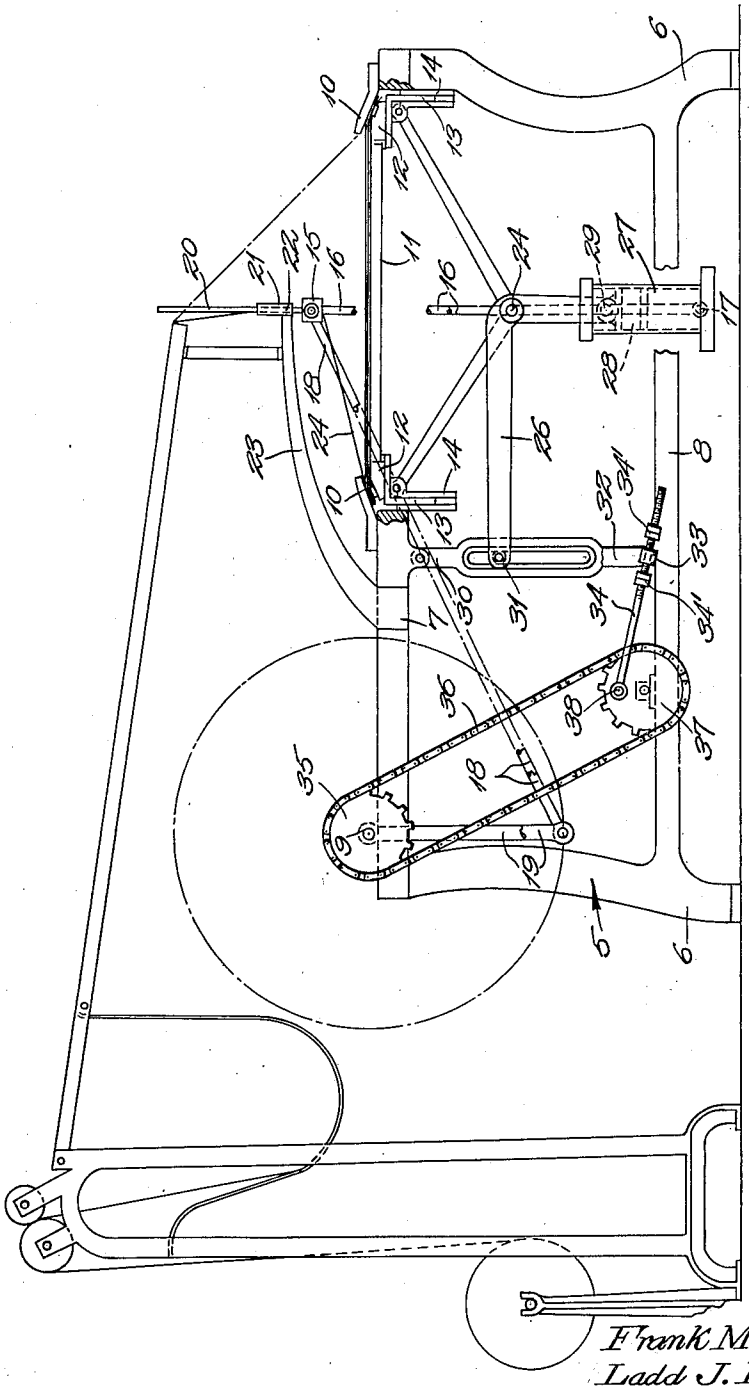


Fig. 1.

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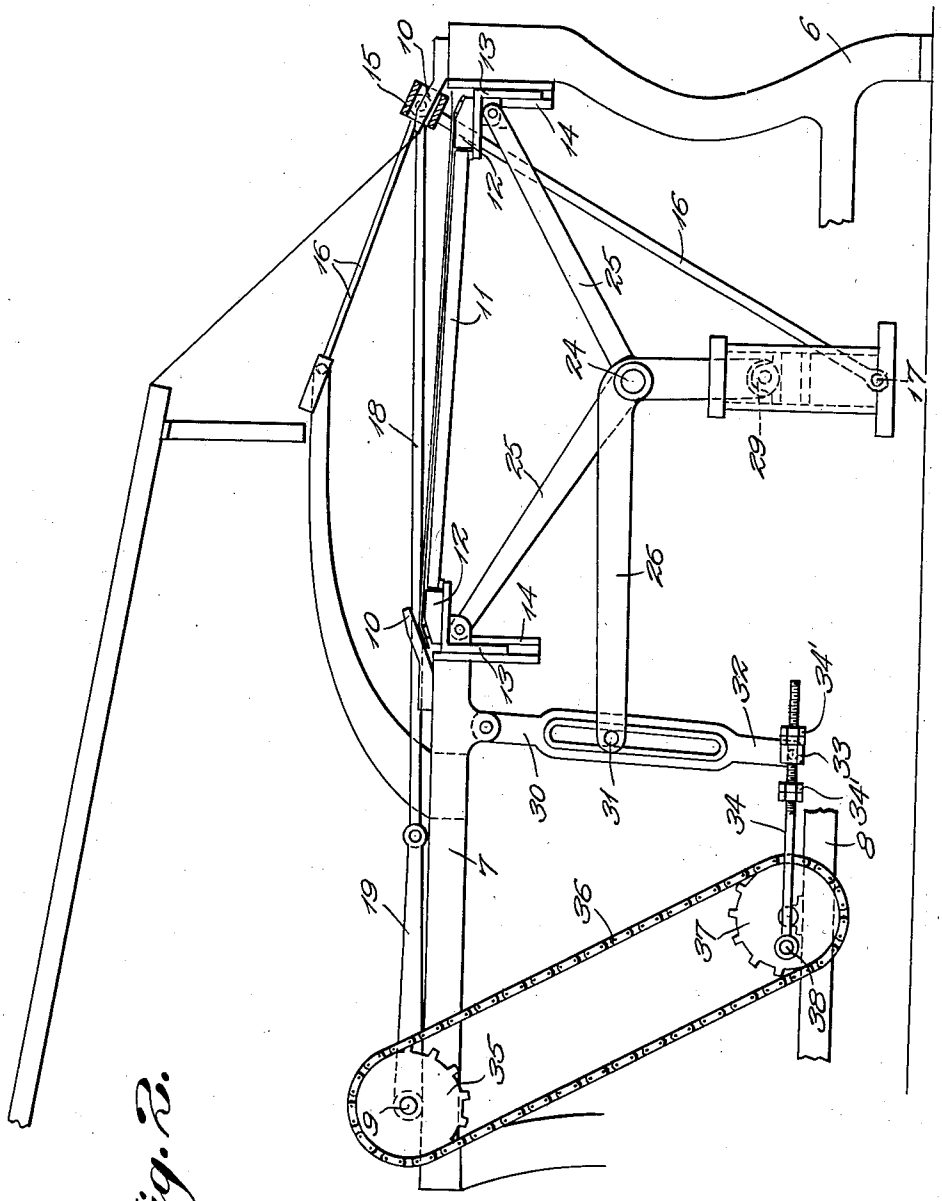


Fig. 2.

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CLOTH-FOLDING MACHINE

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Refiled for abandoned application Serial No. 146,938, June 7, 1937. This application September 8, 1938, Serial No. 229,024

3 Claims. (Cl. 270—79)

This invention relates to cloth folding machines and more particularly to those types of machines wherein the sets of jaws for holding the cloth are alternately released to receive therebetween additional folds of cloth during the folding operation.

This application is filed in lieu of abandoned application Serial No. 146,938 filed June 7, 1937 and is a substantial duplicate thereof.

Heretofore, in machines of this character the mechanisms employed for releasing or applying pressure to the jaws usually comprised numerous links and rods, which were operated by means of various cam and roller devices. Structures embodying parts and devices of this type of mechanism were the subjects of innumerable adjustments and replacements of parts, due to the fact that a very slight amount of wear on the parts would oftentimes result in the improper timing of the parts, thus causing the mechanisms to function in an unsatisfactory manner. Furthermore, parts of this character were given too much vibration, thereby causing considerable hammering, chattering and jarring. Therefore, complicated mechanisms of this type required the services of one highly skilled and specialized in the art in order to make replacements and proper adjustments of the parts. The time required for replacement and adjustment resulted in a considerable loss of time and, as a consequence, affected materially the production of the machine.

This invention overcomes many of these objectionable features and disadvantages by eliminating a considerable number of the undesirable parts, substituting parts of a different character, arranging others in a different manner, and modifying the form of others. Therefore, it is one of the principal objects of this invention to provide means for operating the jaws of folding machines which is simple in construction, efficient in operation, and economical in maintenance.

Another object of this invention is to provide a mechanism for operating the jaws which reduces to a minimum the adjustment and replacement of parts.

A further object of this invention is to provide means having parts requiring little adjustment over a long period of operation and which are capable of being made by the average mechanic in considerable less time than heretofore possible.

Still another object of this invention is to provide means, embracing the various parts, whereby the so-called chattering, jarring and hammering inherent in machines of this character is reduced to a minimum.

Other objects and advantages will be apparent from the following description, appended claims and annexed drawings.

Referring to the drawings wherein like reference characters designate like parts throughout the several views:

Figure 1 is a side elevation of a typical folding machine having this invention incorporated therein.

Figure 2 is a similar view, the parts being shown in another position.

For the purpose of illustration, there is shown a preferred embodiment of this invention incorporated in a typical folding machine which comprises a frame 5 having spaced supports 6 connected together by upper and lower cross members 7 and 8 respectively. The upper member constitutes a base on which is mounted driving mechanism having a drive shaft 9. Positioned on the base are oppositely disposed stationary jaws 10, intermediate of which is a vertical movable table 11 pivotally connected at opposite ends to movable jaws 12. The jaws 12 are mounted for vertical movement on supporting brackets 13 which are adapted for sliding engagement in blocks 14.

The machine also comprises a pair of folder blades 15 mounted upon radius arms 16, swinging around pivotable centers 17 at their lower ends with said arms operatively connected by means of connecting rods 18 with a pair of cranks 19 mounted on the drive or actuating shaft 9, whereby the blades are reciprocated back and forth above the table. The blades have combined therewith slidable rods 20 working in guide sleeves 21, which are pivotally mounted as at 22 in an elevated position upon upstanding brackets 23 rising from and secured to the base 7. The said rods 20 and guide sleeves control the movement of the folder blades 15 in the well-known manner by causing the blades to rock back and forth above the table 11, so as to cause them to act alternately in pushing folds of the cloth C in between the jaws of the pairs of jaws at the opposite sides of the table.

In the machine illustrated, the jaws 12 mounted on the brackets 13, as heretofore described, are pivotally connected at the point 24 by means of divergent connected members or links 25 to a bell crank 26. For the purpose of moving the jaws 12 upward towards the stationary jaws 10, which causes the table to assume a slanting position for the purpose of clamping one

set of the folds of the cloth between one pair of jaws or releasing the clamping action of the oppositely disposed pair of jaws to enable the blades to position another fold of cloth therebetween, there is employed a source of pressure, for instance fluid pressure means which comprises a cylinder **27** containing a piston **28** that is connected as at **29** to the lower end of the bell crank **26**.

Means for controlling the varying position of the pivot **24**, which causes the clamping action of one set of jaws and the releasing of the opposite set together with the tilting movement of the table, embraces a depending rocker arm or pivot actuating means **30** movably mounted on the base and having formed therein a slot for the reception of a pin or roller **31** carried by the horizontal arm section of the bell crank **26**, the pin **31** adapted to slide within said slot for moving the bell crank.

Thus, any change in the position of the link **30** will, as a consequence, through the medium of the pin **31** and bell crank **26** change the position of the pivot **24**, resulting, due to the shifted position of the links **25** about the pivot **24**, in a clamping action by one set of jaws and a releasing action by the other set together with the shifting of the table upon upward movement of the piston **28**.

In place of the many links and rods which are provided with rollers for contact with cams and the like usually used in machines of this type for operating and controlling the mechanism for shifting the pivot **24**, the rocker arm **30** is formed with a lower extended section **32** on which is pivotally mounted a sleeve **33** for receiving a connecting rod **34** arranged to reciprocate over a predetermined distance therein. Means for limiting the reciprocation of the rod **34** comprises sets of adjusting nuts **34'** threaded thereon and arranged with one set on each side of the sleeve **33**, as clearly illustrated in the drawings.

Fixed to the drive shaft **9** and rotating therewith is a sprocket **35** connected by means of a suitable chain **36** to a driven element or sprocket **37** mounted on the lower cross member **8**. At a point off center, the sprocket **37** is provided with a stub shaft or pin **38** which connects with the connecting rod **38** and imparts a reciprocating movement thereto, which in turn causes the link **30** to oscillate, thus changing the position of the pivot **24** for the purpose hereinafter described. Suitable sources of power, not shown, are connected to the drive shaft **9** and fluid pressure means.

From the foregoing it will be readily understood that the various parts are of such size and so connected and adjusted that they operate in a predetermined synchronized order which effects uniformity in the folding of the cloth.

While we have shown the invention as being provided with the sprocket **37** for imparting motion to the connecting rod **34**, the connecting rod **34** could be connected directly to the sprocket **35** and function in the same manner.

While the foregoing description of parts and operation of the same is the preferred embodiment of this invention, it is to be understood that various modifications and changes may be resorted to without departing from the spirit of the invention or scope of the appended claims.

What we claim is:

1. In a cloth folding machine, the combination with a frame, folding blades, opposite pairs of stationary and movable cloth folding jaws, and a source of pressure, of devices for alternately transmitting pressure to the movable jaws of the respective pairs of jaws and comprising a pair of divergently connected members pivoted to said movable jaws respectively, a crank pivotally connecting said members to said source of pressure, a rocker arm movably mounted on said frame and slidably connected to said crank, a power driven element rotatably mounted on said frame, a rod carried by said element and connected to said rocker arm for oscillating the latter to effect alternate movement of said movable jaws relative to said stationary jaws respectively.

2. In a cloth folding machine, the combination with a frame, folding blades, opposite pairs of stationary and movable cloth folding jaws, and a source of pressure, of devices for transmitting pressure to the movable jaws of the respective pairs of jaws and comprising a pair of divergently connected members pivoted to said movable jaws respectively, a crank pivotally connecting said members to said source of pressure and formed with an angularly disposed section provided with a connecting pin, a rocker arm pivotally mounted on said frame and formed with a slot receiving said pin for effecting sliding connection with said crank, a power driven element rotatably mounted on said frame, and a rod eccentrically mounted on said element and adjustably connected to said rocker arm for oscillating the latter to effect alternate movement of said movable jaws relative to said stationary jaws respectively.

3. In a cloth folding machine, in combination with a frame having folding blades mounted thereon, means mounted on said frame for operating said blades, oppositely disposed sets of cloth folding jaws attached to said frame, a table secured between said sets of jaws, a power device subjacent said table, an arm having a slot and pivoted to said frame, a lever connected to said device and having a pin operable in said slot, means pivotally connecting said jaws and said lever together whereby to alternately apply pressure from said power device to each set of jaws upon actuation of said device and said arm, a rotatable element mounted on said frame, a reciprocating member pivoted on said element and engaging said arm whereby to actuate said arm in synchronism with said first mentioned means, and means carried by said member for adjusting the latter relative to said arm.

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