

May 9, 1933.

J. WICHNER

1,907,693

MACHINE FOR WRAPPING ARTICLES

Filed Aug. 21, 1931

3 Sheets-Sheet 1

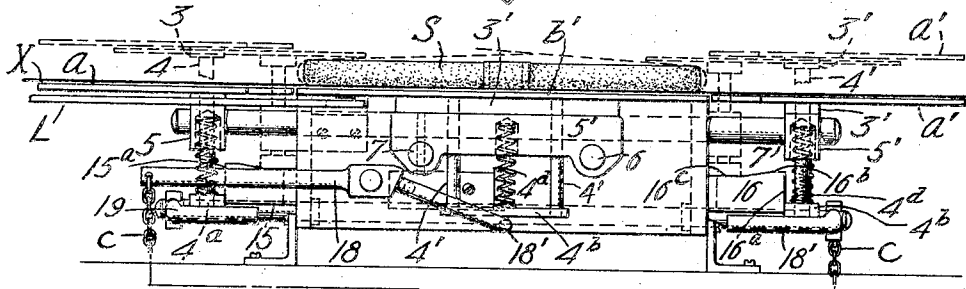
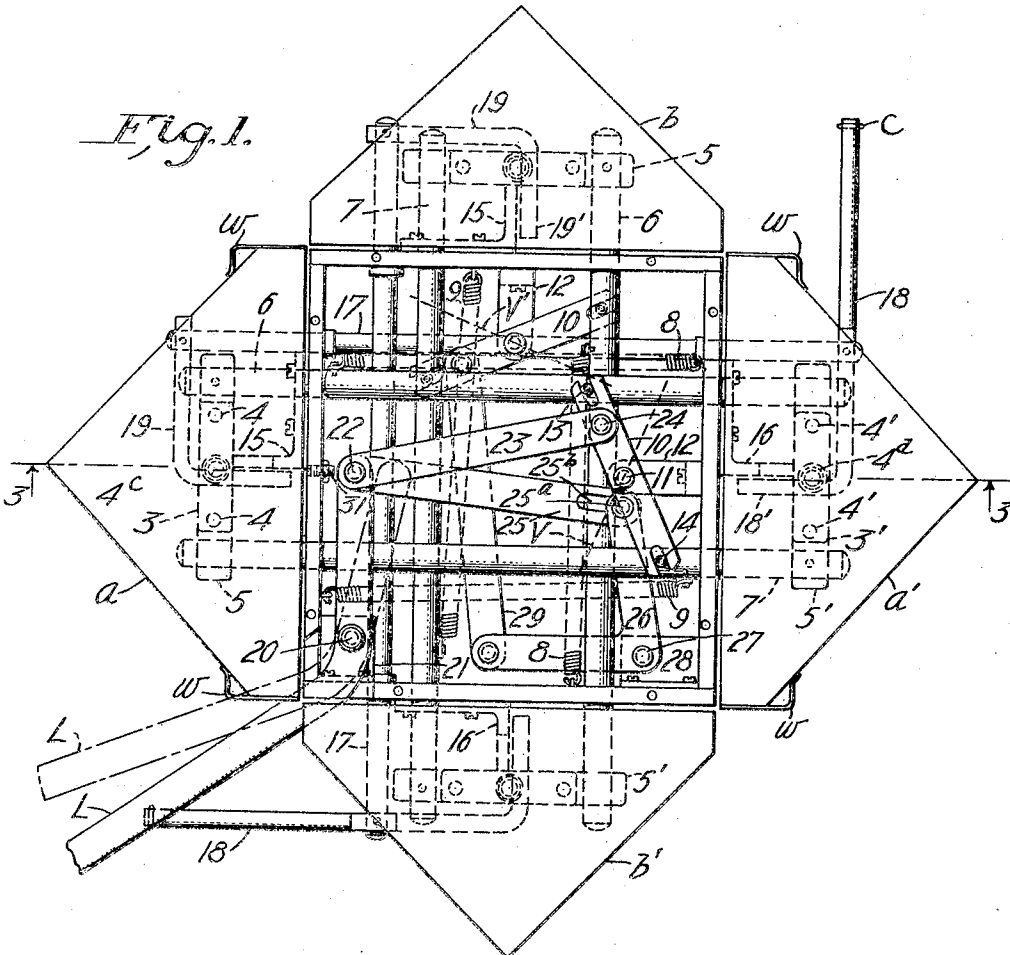
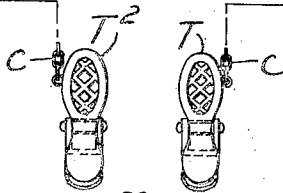


Fig. 2.



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3 Sheets-Sheet 2

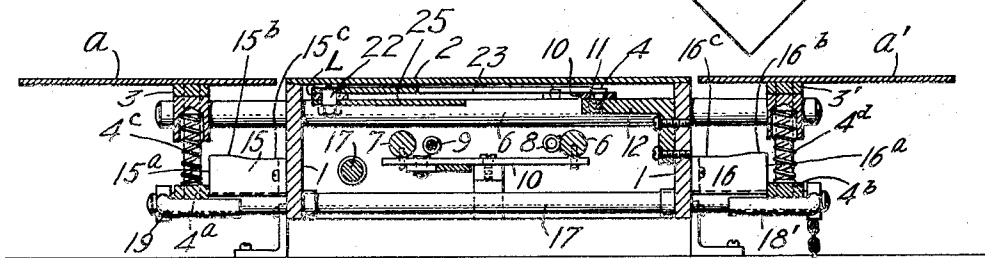
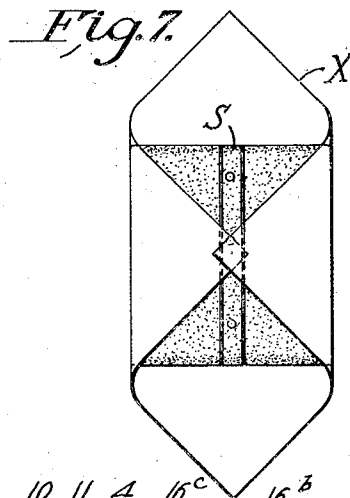
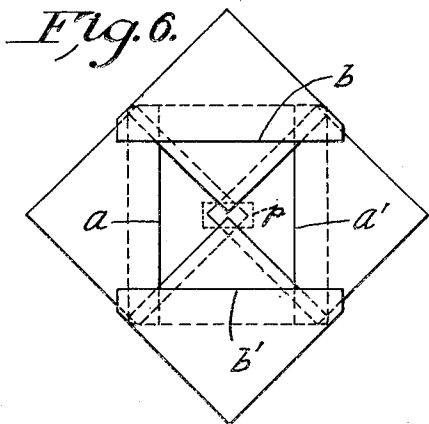
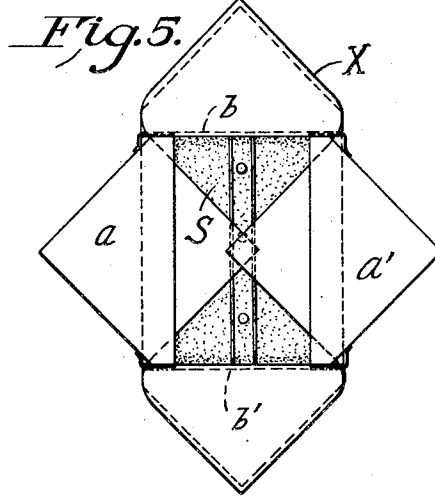
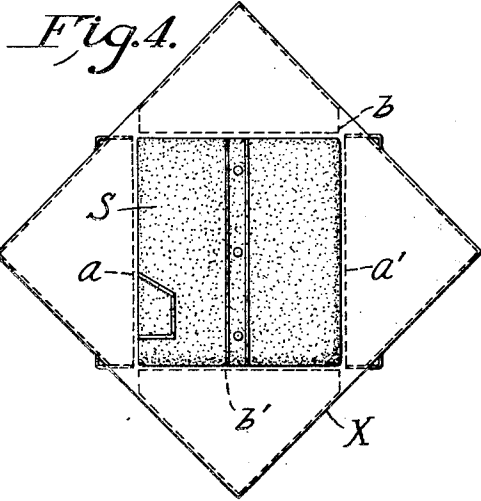


Fig. 3.

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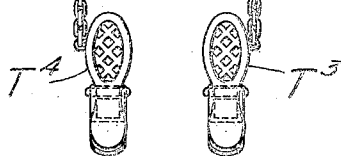
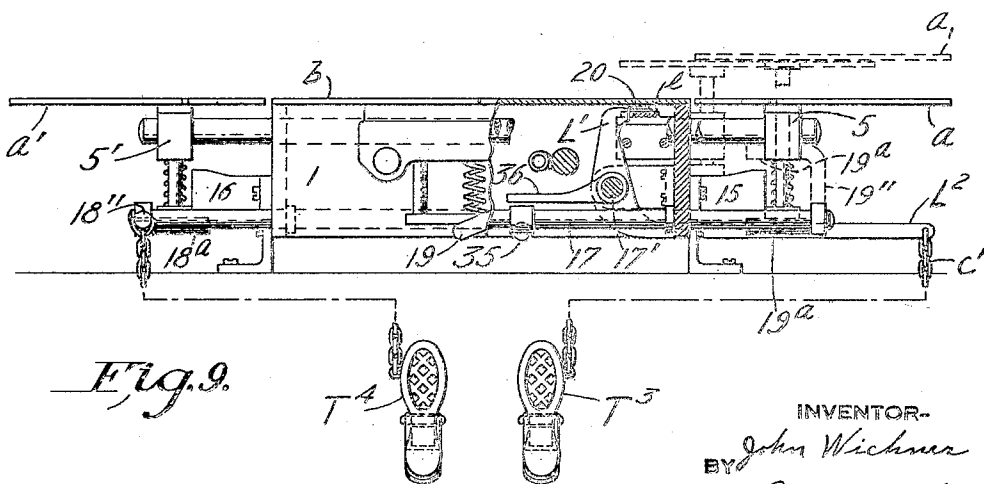
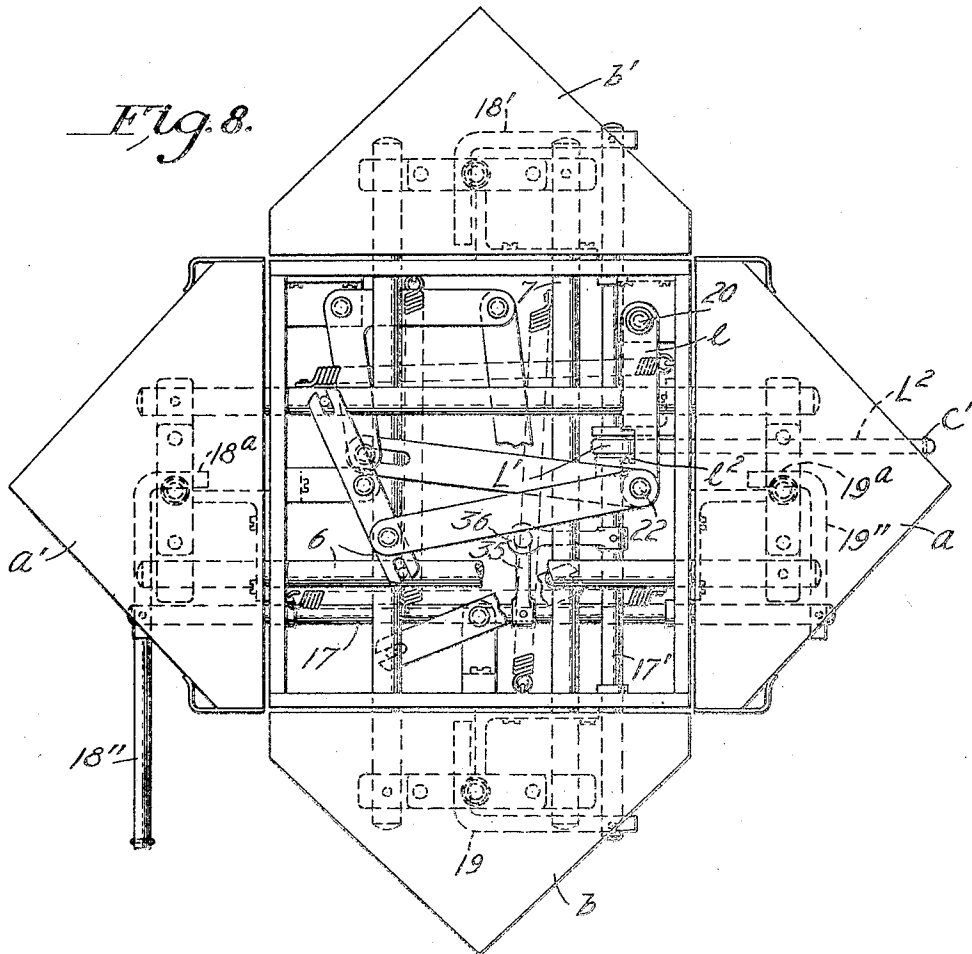
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MACHINE FOR WRAPPING ARTICLES

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MACHINE FOR WRAPPING ARTICLES

Application filed August 21, 1931. Serial No. 558,513.

In the sale of certain articles of merchandise, such for example as men's shirts, it is necessary that they be exposed to view, for the purpose of inspection. A great majority of persons, interested in such articles, not only look at them but feel of them with their fingers, with the result that many articles are soiled and therefore must be sold as seconds at reduced prices.

To prevent such handling, and consequently to obviate the resultant loss thereby, it has more or less recently become the practice to wrap and seal such articles of merchandise in cellophane and to provide only one or two unwrapped articles for the purpose of examination as to quality. Cellophane being transparent, permits inspection of the articles yet precludes such handling thereof as would tend to soil them.

The wrapping of shirts and similar articles in cellophane has, however, been quite an item of expense to the manufacturer inasmuch as the operation has, in the absence of a suitable machine for the purpose, been done by hand at a relatively slow rate.

This invention relates to the wrapping of shirts and similar articles in cellophane or other sheet material and it has for an object to provide a machine capable of performing this operation at a rate many times that at which it can be performed by hand.

Another object of the invention is to provide a wrapping machine of this nature which will have a two-stage movement, both of which are under the control of the operator. Another object is to provide a wrapping machine having two or more operable devices adapted to perform the wrapping operation and to provide a single means for resetting all of such devices after the operation has been completed.

A further object of the invention is to provide a wrapping machine, of the nature described, which is simple in construction and therefore inexpensive to manufacture; which is devoid of delicate or complicated mechanism and therefore may be operated for a great period of time without breakage or failure; and which also may be operated with ease.

Still another object is to provide a wrapping machine which will wrap the article loosely. Cellophane has a relatively high coefficient of contraction and therefore when exposed to the atmosphere contracts greatly. It has been found that in hand-wrapping of shirts with cellophane the wrapper frequently is applied too snugly with the result that when the wrapped article is exposed to the atmosphere the cellophane shrinks substantially and causes the wrapped article to be bent or wrinkled.

These and other objects have been attained by the provision of a wrapping machine, which may be described generally as comprising a central support for the wrapping material and the article to be wrapped. Two pairs of folding elements under the manual control of the operator are normally located beneath the cellophane and arranged at diametrically opposite sides of the article support. The elements of each pair are movable upwardly and inwardly toward each other over the article and the path of movement of one pair is perpendicular to the path of movement of the other pair. These folders carry portions of the wrapping material upwardly and inwardly and place them in overlapping relationship, in which they are maintained by the application of a suitable seal or paster.

A shirt, as commonly folded, is substantially rectangular, being somewhat greater in length than in width. To insure that the cellophane will first be folded over the width of the shirt, for a purpose later to be explained, means is provided for definitely coordinating the movements of the folders so that they will perform the wrapping operation in a predetermined sequence.

A single lever, under the control of the operator serves, after a folding operation, to retract all of the folding elements and place them in position for the reception of another sheet of wrapping material for a subsequent operation.

Drawings depicting a preferred embodiment of my invention are annexed hereto as a part of this disclosure. It is to be understood, however, that I do not limit myself to

the exact construction shown and described. It is recognized that various modifications may be made without departing from the spirit of this invention and such modifications are contemplated and are to be included within the range of equivalency of the appended claim.

In the accompanying drawings Figure 1 is a plan view of a wrapping machine, embodying the present invention, the platform for supporting the wrapper and work being removed, better to disclose the underlying mechanism.

Fig. 2 is a front elevation of the complete machine showing, in dotted lines, a folded shirt on its support and the position of one pair of folders after their folding operation has been completed.

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a diagrammatic plan view illustrating the position of the shirt, the wrapping material and the folding elements in the wrapping of a shirt by my machine.

Fig. 5 is a view similar to Fig. 4, but showing the parts in their positions after the initial folding operation.

Fig. 6 is a view similar to Fig. 4 but showing the parts in their respective positions at the completion of the folding operation, the shirt being omitted for the sake of clearness.

Fig. 7 is a plan view of a folded shirt partly enclosed within a wrapping of cellophane, the cellophane being in the position attained after the initial folding operation, as shown in Fig. 5.

Fig. 8 is a plan view, partly broken away, of a modified form of this invention in which the hand operated resetting lever is replaced by foot controlled means.

Fig. 9 is a sectional view illustrating more clearly the control devices of the modified form of this invention.

Referring more specifically to the drawings, this invention is disclosed in a folding machine comprising a substantially square frame 1 to the upper part of which is secured a plate 2. This plate serves both as a cover to enclose certain mechanism within the frame and also as a central support for a sheet of wrapping material X and for an article S placed thereupon, as later will be described.

Arranged at diametrically opposite sides of the frame, and in the plane of the plate 2, are horizontally disposed wrapper supporting and folding members a — a' and b — b' . The members a — a' constitute a first pair of complementary folding elements adapted simultaneously to be moved upwardly beside the article to be wrapped and inwardly, toward each other and over the article, as shown in dotted lines in Fig. 2. The members b — b' constitute a second pair of complementary folding elements having movements

similar to the first pair but in a path perpendicular thereto, as later will be explained.

The member a is secured upon a block 3 fixed to pins 4 vertically movable in suitable bores provided by a slide block 5. Likewise the member a' is secured upon a block 3' fixed to pins 4' vertically movable in suitable bores provided by a slide block 5'. The pins 4 and 4' are secured at their lower ends in cross bars 4^a and 4^b respectively. Coil springs 4^c and 4^d each has one end seated in a socket in the blocks 5 and 5' respectively, and its opposite end seated on the cross bars 4^a—4^b. These springs serve normally to hold the blocks 3—3' depressed thereby maintaining the folding members in the plane of the platform 2. The slide block 5 is fixed upon a horizontally disposed rod 6 slidably mounted in the frame 1. The corresponding block 5' is likewise fixed upon a similar rod 7 slidably mounted in the frame and arranged parallel to the rod 6.

To maintain the blocks 3 and 3' and 5 and 5', and the folding members carried by the former, rigid during their sliding movement the blocks 5 and 5' are arranged to slide upon the rods 7 and 6, respectively. Coil springs 8 and 9 are attached at one end to the frame 1 and have their opposite ends connected respectively with the rods 6 and 7. These springs serve simultaneously to draw the folding members a and a' inwardly toward each other to the positions illustrated in Fig. 5 whenever those members are released as hereinafter will be explained. To insure that the rods 6 and 7 and thereby the folding members a and a' will be moved synchronously I have provided an equalizing lever 10, fulcrumed intermediate its ends at 11 on a bracket 12 fixed to the machine frame. The opposite ends of the lever are slotted and engage pins 13 and 14 carried by the rods 6 and 7. Fixed upon the opposite sides of the frame 1 are abutment brackets 15 and 16 having vertically arranged abutment faces 15^a and 16^a respectively against which the bars 4^a and 4^b normally bear, under the action of the springs 8 and 9.

Rotatably journaled in the frame 1, parallel to the rod 6, is a rock shaft 17. Upon one end of this shaft there is fixed a lever 18 having an inturned end 18' underlying the cross bar 4^b and serving, upon oscillation of the lever, to elevate the bar 4^b, pins 4', block 3' and the folding member a' . The opposite end of the rock shaft has secured to it an L-shaped rock arm 19 having one end underlying the cross bar 4^a for elevating the same and the parts connected therewith similarly to that previously described with respect to the cross bar 4^b.

Any suitable or conventional means may be provided for rocking the lever 18, such, for example, as a foot treadle T suitably connected with the rear end of the lever, as by a

chain *c*. The upper edge of the abutment brackets 15 and 16 are provided with upper bearing surfaces 15^b—16^b and somewhat lower bearing surfaces 15^c—16^c for purposes later to be explained.

The foregoing describes, in detail, the supporting and actuating mechanism for the pair of folding members *a* and *a'*. The supporting and actuating mechanism for the second pair of folding members, *b* and *b'*, is substantially the same as that above described for the members *a*—*a'*. Repetition of the description of the mechanism is, therefore, deemed unnecessary and undesirable. In the drawings the major elements for supporting and actuating the second pair of folding members have been designated by the same reference characters as those applied to the corresponding elements of the first pair. It is believed that this will suffice. Inasmuch as the two pairs of folding members are to be operated in a predetermined sequence, for convenience in describing the operation of the machine, the foot treadle for actuating the members *b* and *b'* is designated as T².

This invention also provides a single means for simultaneously withdrawing and resetting all of the folding members after the completion of a wrapping operation. This means comprises a hand lever L fulcrumed at 20 on a bearing bracket 21 fixed in one corner of the frame. One end of the lever projects forwardly and to the left of the machine in convenient reach of the operator. To the other end of the lever there is pivoted, at 22, one end of a link 23, whose opposite end is pivotally connected, at 24 with the equalizing lever 10, hereinbefore referred to. A second link 25 also is pivoted at 22 to the lever L and has its opposite end operatively connected with one arm of a bell-crank lever 26, fulcrumed at 27 on a bearing bracket 28 secured in one corner of the frame. The other arm of the bell-crank lever 26, is connected by a link 29 with the equalizing lever 10 which controls the actuating rods 6 and 7 of the folding members *b* and *b'*.

At the completion of the wrapping operation the lever L stands in the position shown in dot-dash lines in Fig. 1, due to the swinging movement of the equalizing levers 10 to the positions indicated by the dotted lines V—V' under the action of the slide rods 6 and 7. To retract the folding members, and to re-set them for a succeeding operation, the operator swings the lever L counter-clockwise, to the position shown in full lines in Fig. 1. This movement, through the action of the links 23 and 25, shifts the equalizing levers 10 to their full line positions, thus moving the folding members *a*—*a'* and *b*—*b'* outwardly in opposition to the springs 8 and 9, the cross-bars 4^a and 4^b sliding along the bearing surfaces 15^b—15^c and 16^b—16^c re-

spectively. When the cross-bars 4^a—4^b have been moved outwardly beyond the vertically arranged abutment surfaces 15^a—16^a, respectively, springs 4^c and 4^d, acting in conjunction with gravity cause the cross-bars, and the parts carried thereby, to be depressed to the position shown in full lines in Figs. 2 and 3. The lever L may then be released and the parts will remain in their adjusted position in opposition to the influence of the springs 8 and 9, due to the engagement of the bars 4^a—4^b with the vertical abutment surfaces 15^a—16^a of the brackets 15 and 16.

A shirt, as commonly folded, is slightly greater in length than in width and, as it is most convenient to use a square sheet of wrapping material, it is desirable that the side folds be effected before the end folds. This so positions the innermost portions of the folded wrapping material that they all may be engaged by a relatively small seal or paster *p*, as shown in dotted lines in Fig. 6. The actuation of folders *a*—*a'* prior to actuation of the folders *b*—*b'* is assured by so constructing and arranging the parts that the folders *b*—*b'* may not be moved until after the folders *a*—*a'* have been released from the abutments 15^a—16^a, at which time they are moved inwardly by the action of the springs 8 and 9. This is effected by providing a lost motion connection, in the form of a pin 25^a and a slot 25^b, between the link 25 and the bell-crank lever 26. This lost motion connection permits the equalizing lever 10, associated with the folders *a*—*a'* to be shifted, at will from the position shown in full lines, Fig. 1, to the position indicated by the dotted line V. This movement shifts the link 23 endwise to the right, thereby swinging the lever L clockwise and also moving the link to the right. The pin and slot connection 25^a—25^b permits the link 25 to move relative to the bell-crank lever 26 which is then locked against movement by reason of the folding members *b*—*b'* being retained in their outer positions by engagement of the cross-bars 4^a—4^b with the vertical abutment walls 15^a—16^a.

With the parts in the positions shown in Fig. 1, the folding members *b*—*b'* may not be moved inwardly without first actuating the members *a*—*a'*. Should the treadle T² be depressed, and the members *b*—*b'* elevated, by shifting the cross-bars 4^a—4^b above the brackets 15—16, the rods 6 and 7 associate with those folders may not be moved under the influence of the springs 8 and 9 because such movement would necessitate swinging of the equalizing lever 10 to the position V'. Such movement would, in turn, necessitate endwise movement of the link toward the folder *b*, clockwise movement of the bell-crank lever 26, endwise movement of the link 25 to the right (Fig. 1) and similar endwise movement of the link 23. This latter is, by

its attachment to the equalizing lever 10, connected with the rods 6 and 7 which are then locked against endwise movement. From the foregoing, it will be perceived that I have provided means for permitting the pairs of folding members to be actuated only in a predetermined sequence.

Any suitable stop may be provided for limiting the outward movement of the folding members. One convenient form of stop is shown at 31 in Fig. 1. When the lever L is released, the springs 8 and 9 causes the rods 6 and 7 and the folding members to move inwardly to shift the cross-bar 4^a—4^b into engagement with the abutment walls 15^a—16^a. This slightly separates the lever L from the stop 31, as shown in Fig. 1. The innermost position of the folding members is determined by engagement of the blocks 5 and 5' with the frame 1. The lost motion between the lever L and stop 31 affords sufficient movement of the parts to enable the operator to shift the folding member outwardly beyond their normal open position, if for any reason this should be desired such for example as to cause the folders to clear the shirt should it be slightly misplaced or displaced.

Operation

The operation of my machine is as follows:—Assuming that the folding members *a*—*a'* *b*—*b'* are in their outermost positions, as shown in full lines Figs. 1, 2 and 3. The operator places a square sheet of wrapping material such, for example as cellophane, on the central support, with the sheet turned 45 degrees relative to the support. The projecting corners of the sheet overlie the substantially triangular folding members, as shown in Fig. 4. A folded shirt is then placed upon the sheet of cellophane, above the supporting platform 2 as shown in Figs. 2 and 4. The platform preferably is the size and shape of a folded shirt and therefore serves as a guide for locating the shirt on the cellophane through which the platform may be seen. Next, the operator actuates the treadle T which through the connections hereinbefore described causes the cross-bars 4^a—4^b, and the members 3—3' connected therewith, to be elevated to the positions shown in dot-dash lines in Fig. 2. This causes the projecting corners of the cellophane to be turned upwardly about the folded shirt. Immediately the bars 4^a—4^b have cleared the abutment walls 15^a—16^a, respectively, the springs 8 and 9 draw the rods 6 and 7, and the folding members *a*—*a'* connected therewith, inwardly to the positions shown in dotted lines in Fig. 2 and in full lines in Fig. 5. The bars 4^a—4^b slide inwardly on the bearing surfaces 15^b—16^b and, under the influence of the spring 4^c—4^d drop to the lower bearing surfaces 15^c—16^c. This

drop removes the members *a*—*a'* out of the plane in which the members *b*—*b'* shall later move and depresses the cellophane into contact with the shirt. As the folding members *a*—*a'* move toward each other they fold the corners of the cellophane over the folded shirt into overlapping relation as shown in Figs. 2, 5 and 7.

Next the operator depresses the treadle T² which, through the connections previously described, causes the folding members *b*—*b'* to be moved upwardly and inwardly, thereby folding the other projecting corners of the cellophane around and over the shirt and into overlapping relation with the first folded corners of the cellophane wrapper, as shown in Fig. 6. The operator may then apply an adhesive seal or paster *p* to the overlapped portions of the cellophane, as shown in Fig. 6, to hold the parts in their folded position and maintain the package closed.

Under certain conditions of operation it may be preferred that the machine be controlled solely by the feet, thereby allowing the operator freely to use both hands in arranging the articles before and after being wrapped and with this end in view the device illustrated in Figs. 8 and 9 is proposed.

The operation and functioning of an alternative form of the machine, Figs. 8 and 9, is similar in many respects to the operation and functioning of the machine illustrated in Figs. 1, 2 and 3, there are, however, a few differences which will now be explained.

For convenience in manipulating the various controls, later to be described, the machine proper is revolved 180° about a vertical axis, this, it will be noted, places the control lever L toward the rear of the machine and diagonally opposite its former position. As illustrated in Fig. 8, the handle portion of the lever L is removed close to its fulcrum point 20 and as a substitute therefor, a bell crank lever L² is journaled on the rock shaft 17' and has one arm L' in engagement with the inner side of the lever L. The bell crank actuator L² extends through the side of the machine and has its outer end connected in a suitable manner e. g. by a chain *c'* to a foot treadle T³. Thus it will be seen that a downward movement of the lever effects the same movements of the parts and resets the folding members *a*—*a'*, *b*—*b'* in the very same manner as a lateral movement of the lever L of the device shown in Fig. 1. In order that the upstanding portion L' of the bell crank lever does not bind or contact with any of the other elements within the machine frame, the link *l* is cut away at *l'* thereby to provide a recess within which the portion L' fits.

It is, therefore, apparent that by changing the resetting device from hand control to foot control enables the operator to quickly and easily remove the wrapped article and to prepare for the next operation.

The foregoing arrangement normally would necessitate the use of three pedals, however, to avoid confusion in their operation and to simplify the control means, it is

5 proposed to combine the function of the pedals T^1 and T^2 of Fig. 2 into a single two step control pedal T^4 which, when actuated, effects movement of the folding platens $a-a'$, $b-b'$ in the same sequence as before.

10 This is accomplished by means of short levers 35 and 36 keyed respectively to the rock shafts 17 and 17' and arranged so that one intercepts and actuates the other. The free end of the lever 35 underlies and is spaced from the free end of the lever 36 so as to permit an initial idle movement there-
15 of for a purpose later to be explained before engaging the last mentioned lever.

The lever 35, being secured to the shaft 20 17, is oscillated by means of the lever 18'', the initial movement of which elevates the folders a and a' whereupon they are caused to slide inwardly on the cam faces of the block 15 and 16, as previously explained, and complete the first step of the folding
25 operation. At this point, the lever 35 has just contacted with the underside of lever 36, and further movement of the treadle effects elevation of the second pair of folders.

30 However, in order that the lever 35 may complete this movement and rock the lever 36, the arms 18^a and 19^a of the levers 18'' and 19'' are reduced in length so as to swing past the blocks 5 and 5' when the folders a and a'
35 have been moved to their innermost position. In this manner the two sets of folders are successively actuated by a single two stage control means T^4 , and it will be noted also that movement of the folders b and b'
40 is always preceded by the movement of the folders a and a' , because of the lost motion between the levers 35 and 36, and as a further consequence the folding members can never become out of time.

45 To facilitate folding the cellophane at the corners of the shirt during the second folding operation, the folding members $a-a'$ are provided with wire projections w which overlie the first folded corners of cellophane and over which the corners, last to be folded,
50 are turned.

Having thus revealed this invention, what I claim and desire to secure by Letters Patent of the United States is:

55 A wrapping machine comprising a support for a sheet of wrapping material and an article to be wrapped, a plurality of folding elements arranged about said support and beneath said material and movable vertically
60 and horizontally to wrap the material about said article; abutment means acting temporarily to prevent movement of said elements horizontally, means to move said elements vertically to disengage them from said abut-
65 ment means, and spring means to move said

elements horizontally after they have been disengaged from said abutment.

In witness whereof, I have hereunto subscribed my name.

JOHN WICHNER. 70

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