

**June 23, 1931.**

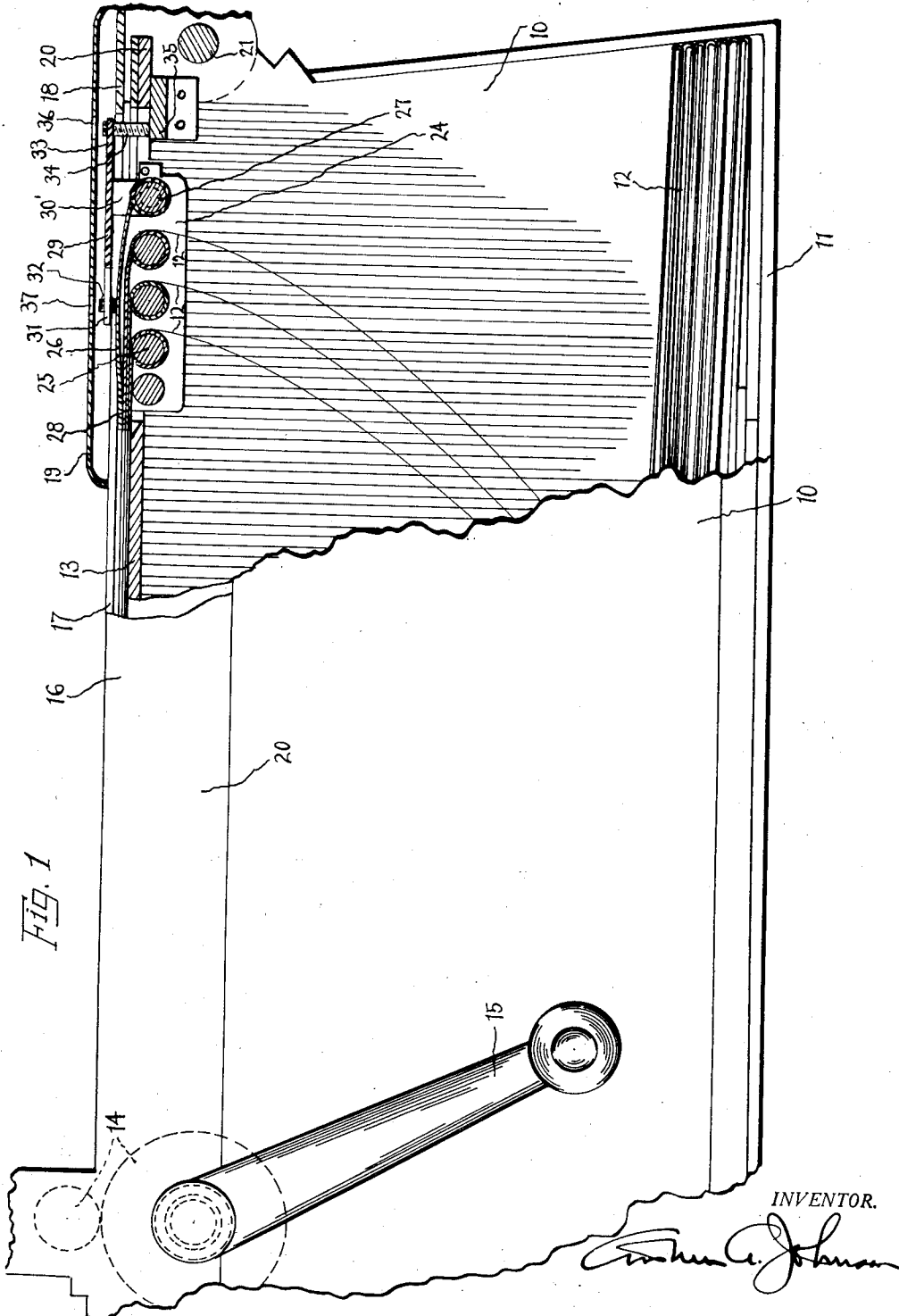
A. A. JOHNSON  
MANIFOLDING MACHINE

**1,811,636**

Filed June 17, 1927

2 Sheets-Sheet 1

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INVENTOR.

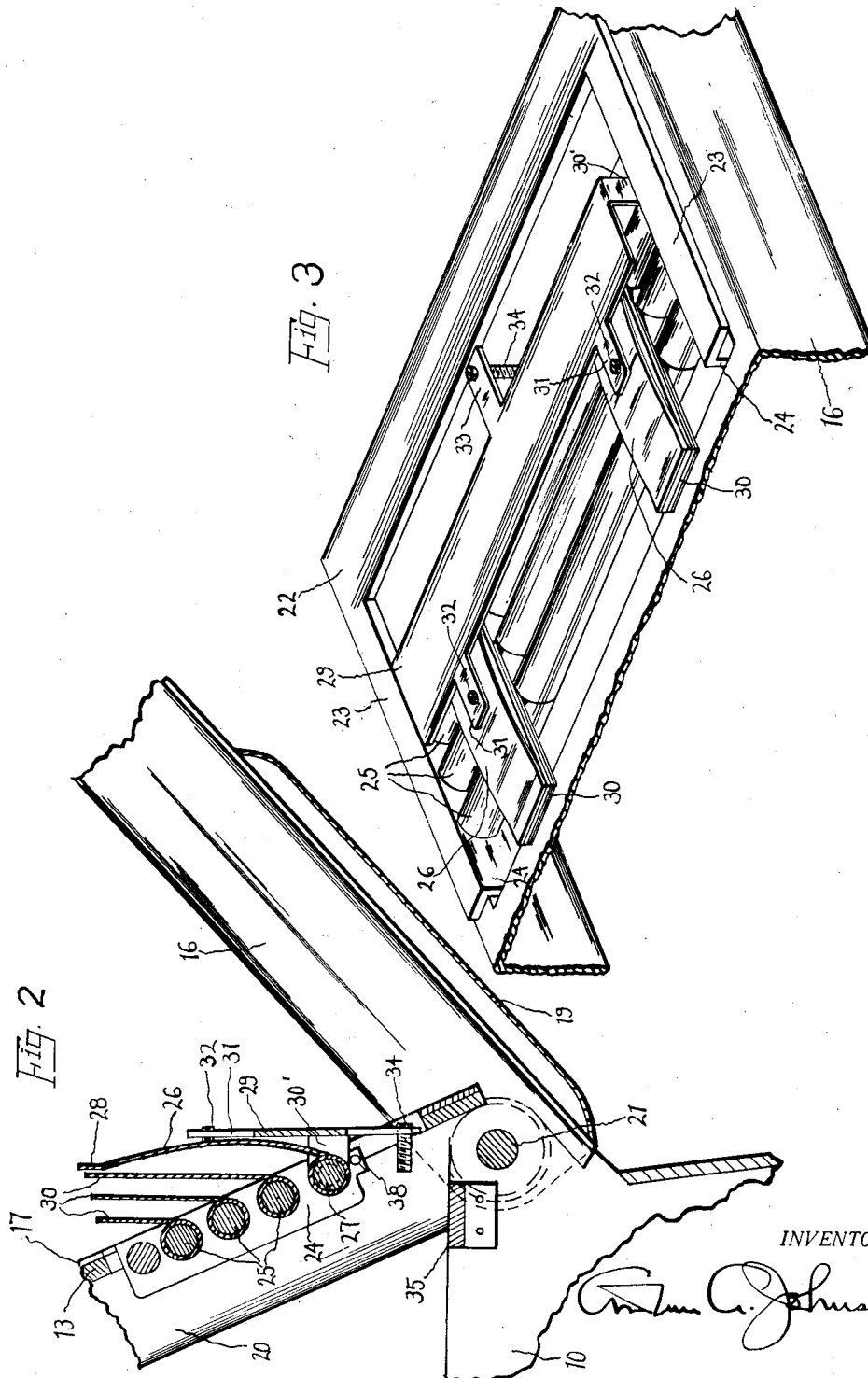
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2 Sheets-Sheet 2



INVENTOR.

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## UNITED STATES PATENT OFFICE

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## MANIFOLDING MACHINE

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This invention relates to manifolding machines, and more particularly to means for controlling the worksheets in their feeding movements to the platen and while on the  
5 platen.

In certain types of manifolding machines now on the market, the worksheets are led from a supply compartment upwardly and then forwardly over guide rollers to the  
10 platen at which point they are written upon. In one form of such machines, the worksheets are separated after they pass over the guide rollers and as they approach the platen, and at the same time a sufficient tension or drag  
15 is placed on the sheets so that they will be fed properly and so that they will be held on the platen with some tension against movement during the writing operation. In the type of machine referred to, this tension is  
20 usually produced by bowing the separating means and making them of springy material so that when the margin frame or cover plate is brought down to operating position, the separator means are forced down and, due to  
25 their tension, produce friction between them and the worksheets which pass between them.

In this form of device, in order to change the amount of tension, it is necessary to change the shape of the springy separator  
30 plates and, as is well known, it is a difficult and time-consuming operation to do this and yet have the separator plates at one side of the web tensioned properly with respect to the separator plates at the other side of the  
35 web. This is because the only way to vary the tension is to bend the springs up or down by the cut-and-try method until the proper tension is obtained.

It is an object of the present invention to  
40 provide means whereby the tension placed upon the worksheets passing between the separators may be varied at will without bending the springy separator plates by hand.

Another object of the invention is to provide means whereby the tension produced by the separator plates may be varied while the machine is in use so that the effect of the variations may be noted.

A further object of the invention is to provide common means for varying simultane-

ously the tension produced by the several groups of separator plates when more than one group of plates is used.

A still further object is to provide means for separately varying the tension produced  
55 by one or more groups of separator plates when more than one group of separator plates are used.

And a still further object of this invention is to provide a device in which all of the separator plates of each group, except the uppermost one, may be made substantially flat and rigid, and in which the individual tension on the several worksheets is produced by the uppermost separator plate which  
65 is made resilient.

Other features and advantages will hereinafter appear.

In the accompanying drawings which show one embodiment of this invention, the  
70 one at present preferred—

Figure 1 is a side elevation of a manifolding machine partly in section and showing this invention as applied thereto.

Fig. 2 is a sectional view of the rear end  
75 of the manifolding machine shown in Fig. 1, showing the various parts in the positions they assume while the machine is being loaded.

Fig. 3 is a perspective view of the paper  
80 guiding mechanism showing the parts in the positions shown in Fig. 1.

As shown in the accompanying drawings, the manifolding machine comprises sides 10 having a bottom 11 for supporting a pile of  
85 worksheets 12 which are led from the pile upwardly and, by guide mechanism to be later described, forwardly over a platen 13 upon which the worksheets are supported for writing operations. At the platen, the  
90 worksheets 12 are interleaved with carbon sheets or other transfer material so that original writing on the top sheet will be duplicated on the under sheet. After the sheets have been written upon, they are advanced  
95 form length by feed mechanism located at the front end of the machine and comprising cooperating feed-rollers 14 and a driving crank 15 therefor.

The worksheets 12 are confined on the 100

platen 13 for writing purposes by a marginal frame 16 having side or margin guides 17 tied together at the rear by a cross-bar 18 and a platform 19 which serves as a rest for the hand while writing on the worksheet.

Both the marginal frame 16 and the platen 13 are usually made movable to facilitate loading, i. e. preparing the machine for use by threading the worksheets into proper position and placing the transfer material therebetween.

In the machine shown in the accompanying drawings, the platen 13 is mounted in a platen frame 20 and the latter with the marginal frame 16 is pivotally mounted on a rod 21 supported in the sides 10 of the machine at the rear end thereof. Thus, the margin frame and platen frame may be swung upwardly to their positions shown in Fig. 2 in which loading of the machine is facilitated.

In addition to the construction above described, manifolding machines as heretofore made have been provided with a worksheet guiding frame 22 secured to the platen frame 20 and comprising forwardly extending arms 23 bent downwardly to provide guide-plates 24 for the side edges of the worksheet. The guide-plates 24 also constitute bearings for guide-rods or rollers 25 over each of which a worksheet rides in moving from the pile to the platen 13.

Heretofore, means in the form of separator plates were provided on the guide frame 22 for separating the worksheets 12 as they approached the platen for the dual purpose of preventing the worksheets from dragging one another and for spacing the worksheets just before they pass between the carbon sheets so as to prevent any rough parts of the worksheets catching on the carbon sheets and becoming torn. In addition, these separator plates were arranged to cooperate with means on the marginal frame so that when the marginal frame was in operative position, the separator plates would be pressed against the worksheets to tension them as they are advanced and to hold them against accidental displacement when the writing operation was being performed.

In these previous constructions, the amount of tension produced was varied to meet various conditions by manually bending some resilient part or parts of the separator plates or the means on the marginal frame which engage the separator plates. This method of adjusting the tensions produced by the separator plates was unsatisfactory in many cases, because it was an empirical method, and in addition to consuming considerable time was very difficult to accurately perform.

The present invention obviates these difficulties by providing means for individually adjusting one or more groups of separator fingers, and also means common to all of

the groups of separator fingers for simultaneously varying the tension thus individually controlled.

The present invention further overcomes some difficulties heretofore experienced with previous constructions by providing means on the platen frame for controlling the separator fingers as distinguished from means mounted on the marginal frame. With the means mounted on the platen frame, the tensions may be adjusted while the machine is in actual operation, with the marginal frame raised out of the way. Another decided advantage of this construction over the previous construction is that the tension is completely controlled by the mechanism and no additional tension is produced by flexing of the marginal frame when subjected to a weight such as the operator's arm or hand resting on the marginal frame.

The means provided by the present invention for the purposes described comprises flat separator fingers 30 mounted on the guide rods or rollers 25 extending to a point above the rear end of the platen 13. These flat separator fingers have their rear ends wrapped around the rods 25 to hold them thereto and adapted to pivotally move on the rod so that they may yieldingly engage worksheets 12 which pass between the fingers, and also so that they may move to position such as shown in Fig. 2 in which the worksheets may be conveniently threaded between them.

Preferably, there are one or more groups of flat separator fingers 30, two being shown in the accompanying drawings, and these engage parts of the worksheets equi-distant from the center line of the worksheets at their side margin. In addition to these flat separators 30, the present invention provides a bowed tension plate 26 pivoted on a rod 27 to the rear of the rods 25. The forward edge 28 of the tension plates 26 is adapted to overlie the forward edges of the separator plates 30 and press downwardly thereon, and also worksheets interposed between the uppermost separator plate 25 and the ends 28 of the tension plate 26. The arrangement is such as will be clearly understood from the drawings that when the bowed tension plate 26 is depressed, the amount of friction produced between the worksheets and the separator plate 30, the tension plate 26 is increased, when the tension plate 26 is allowed to rise, the friction is reduced.

For the purpose of controlling the downward pressure of the forward ends 28 of the tension plate 26, the present invention provides a bail 29 having ears 30' pivotally mounted on the rod 27. At its forward end, the bail 29 is provided with ears 31 carrying kerfed screws 32 each adapted to engage the bowed surface of the tension plates 26 with which they cooperate. At its rear end, the bail 29 carries an ear 33 in which there is

mounted an adjustable screw 34 adapted to engage an abutment 35 mounted in the side plates 10 against movement. The arrangement is such that when the parts are in the positions shown in Fig. 1, the adjusting screw 34 engages the abutment 35 and holds the bail 29 in predetermined position with the screws 32 in the ears 31 engaging the bowed surfaces of the tension plate 26 and holding the tension plate depressed in a predetermined position.

To adjust the tension of both groups of separator plates 30, or two or more groups of separator plates, if such are used, it is merely necessary to turn the adjusting screw 34 by means of a screw-driver which may be inserted through a hole 36 in the hand-rest plate 19 until the desired tension is produced, turning the screw one way to decrease the tension produced by the groups of separator fingers and tension plates, and turning the screw in the other direction to increase the tension so produced.

In order to adjust individually the tension produced by any group of separator fingers and tension plates, it is merely necessary to insert a screw-driver through a hole 37 in the hand-rest plate 19 directly above the screw 32 of that group and rotate the screw in one direction or the other, according to whether it is desired to increase or decrease the tension on the group of plates being so adjusted.

It will thus be clear that the tension produced by the group of separator fingers and tension plates may be varied individually or collectively while the machine is in operative condition. Thus, the person making the adjustment may operate the driving crank 15 to feed the strip 12 the effect of the tensioning device and change the amount of tension produced while the strips 12 are travelling until the proper or desired tension is obtained. This may be done either while the margin frame 16 is in operative position as shown in Fig. 1, or when it is raised, for the operating and tensioning mechanism of the present invention is in no way effected or controlled by the margin frame.

While the bail 29, tension plate 26, and separator fingers 30 are held in operative position while the platen frame is in normal position shown in Fig. 1, means are provided by the present invention for rendering the bail 29 inoperative to permit the fingers to spread when the platen frame 20 is swung upwardly on the rod 21 to the position shown in Fig. 2. This is accomplished by providing a separable connection between the adjusting screw 34 and the abutment 35, and arranging the parts so that when the platen frame 20 is swung upwardly the adjusting screw is moved clear of the abutment 35 and hence the bail is allowed to swing upwardly, thus permitting the separator fingers 30 to spread as shown in Fig. 2. While the fingers

are in this spread condition, it is an easy matter to thread the leading edges of a new supply of work sheets 12 between them. Free pivotal movement of the bail 29 is limited by means of a pin or stop 38 mounted in the sides of the guide-roller frame 24. This pin 38 engages one of the ears 30 of the bail 29 and holds it in a position in which the bottom of the adjusting screw 34 will be directly above the abutment 35 so as to engage the upper surface thereof when the platen frame 20 is returned to normal position shown in Fig. 1.

It will thus be seen that the present invention provides means for individually or collectively adjusting the tension produced by one or more groups of separator fingers on worksheets traveling through the machine, and that means are provided for rendering the tension producing means inoperative so as to give free access to the space between separator fingers for facilitating loading when the platen frame is swung upwardly from normal position.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

Having thus described the invention, what is claimed as new and for which it is desired to obtain Letters-Patent, is:—

1. In a manifolding machine having a platen over which a plurality of webs is fed, a plurality of sets of means extending between the webs as they approach the platen to separate and frictionally engage the webs; and adjustable means common to said plurality of sets of means for applying thereto a variable pressure.

2. In a manifolding machine having a platen over which a plurality of webs is fed, a plurality of separators between which the plurality of webs pass in approaching the platen; and variable means common to said plurality of separators for applying a desired pressure thereto to enable the separators to exert a predetermined braking action upon said webs as the latter are fed by said feeding means.

3. In a manifolding machine having a platen over which a plurality of webs is fed, a plurality of sets of separators between which the plurality of webs pass in approaching the platen, the said sets of separators being spaced from each other transversely of the direction of feed of the webs; and means common to a plurality of said sets of separators for applying pressure thereto to enable each set of separators to exert a predetermined braking action upon the webs as the latter are fed by said feeding means.

4. In a manifolding machine having a platen over which a plurality of webs is fed, a plurality of sets of separators between which the plurality of webs pass in approach-

- ing the platen, the said sets of separators being spaced from each other transversely of the direction of feed of the webs; and variable means individual to each set of separators for applying a predetermined pressure thereto to enable each set of separators to exert a predetermined braking action upon said webs as the webs are fed by said feeding means.
5. In a manifolding machine having a platen over which a plurality of webs is fed, a plurality of sets of separators between which the plurality of webs pass in approaching the platen, the said sets of separators being spaced from each other transversely of the direction of feed of the webs; means common to a plurality of said sets of separators for applying pressure thereto to enable each set of separators to exert a predetermined braking action upon the webs as the latter are fed by said feeding means; and variable means individual to each set of separators for applying a predetermined pressure thereto to enable each set of separators to exert a predetermined braking action upon said webs as the webs are fed by said feeding means.
6. In a manifolding machine, the combination of a plurality of sets of separators; means common to said plurality of sets of separators for applying a predetermined pressure to each set; and means for adjusting the last-named means to vary pressure applied to the sets by said means.
7. In a manifolding machine, the combination of a plurality of sets of separators; means universal to a plurality of sets of separators for applying pressure to each set; means for adjusting the universal means to vary simultaneously the pressures applied to all the sets of separators by said means; and adjusting means to vary individually the pressures exerted by the universal means.
8. In a manifolding machine, the combination of a plurality of sets of separators; means universal to a plurality of sets of separators for applying pressure to each set; means for adjusting the universal means to vary simultaneously the pressures applied to all the sets of separators by said means; and adjusting means to vary individually the pressures exerted by the universal means while the machine is in operation.
9. In a manifolding machine, a main frame, a platen frame over which a plurality of webs are advanced, said platen frame being movable relative to the main frame; a plurality of separators mounted on the platen frame and extending between the webs as the latter approach the platen to separate and frictionally engage the webs; and means mounted on the platen frame for placing the separators under tension to cause the separators to exert a predetermined action upon said webs as the latter are advanced over the platen.
10. In a manifolding machine having a platen over which a plurality of superposed webs is fed, a plurality of means extending between the webs as they approach the platen to separate and frictionally engage the webs; and manually operated adjusting means common to all of the first-named means for varying at will the friction produced between the webs and the means frictionally engaging the webs.
11. In a manifolding machine having a platen over which a plurality of superposed webs is fed, a plurality of means extending between the webs as they approach the platen to separate and frictionally engage the webs; and a manually adjustable plate common to all of the first-named means for varying at will the friction produced between the webs and the means frictionally engaging the webs.
12. In a manifolding machine having a platen over which a plurality of superposed webs is fed, a plurality of means extending between the webs as they approach the platen to separate and frictionally engage the webs; a pivotally mounted plate cooperating with said friction producing means and common to all of the latter; a stationary member adjacent the plate; and manually operable means for pivotally moving the plate with respect of the stationary means for causing the plate to vary the friction produced between the friction producing means and the webs.
13. In a manifolding machine having a platen over which a plurality of superposed webs is fed, a plurality of means extending between the webs as they approach the platen to separate and frictionally engage the webs; a pivotally mounted plate cooperating with said friction producing means and common to all the latter; a stationary member adjacent the plate; and means for moving the plate with respect of the stationary means for causing the plate to vary the friction produced between the friction-producing means and the webs.
14. In a manifolding machine having a platen over which a plurality of superposed webs is fed, a plurality of means extending between the webs as they approach the platen to separate and frictionally engage the webs; a pivotally mounted plate cooperating with said friction producing means and common to all of the latter; a stationary member adjacent the plate; and a screw accessible while the machine is in condition for use and the webs are being fed for pivotally moving the plate with respect of the stationary means for causing the plates to vary the friction produced between the friction producing means and the webs.
15. In a manifolding machine having a platen over which a plurality of superposed webs is fed, means extending between the webs

as they approach the platen to separate and frictionally engage the webs, a movable cover plate being provided in the machine for holding the worksheets in operative position on the platen; and manually operable means operable through an aperture in the cover when the latter is in operative position for varying at will the friction produced between the webs and the said means frictionally engaging the web.

16. In a manifolding machine, the combination of a main frame; a platen frame over which a plurality of superposed webs is fed, said platen frame being pivotally mounted on the main frame; means extending between the webs as they approach the platen to separate and frictionally engage the webs; means on the platen frame for putting the means frictionally engaging the webs under tension; and means on the main frame adapted to cause the said means mounted on the platen frame to lie in operative position when the platen frame is in operative position and to be inoperative with relation to the means frictionally engaging the webs when the platen frame is pivotally moved to inoperative position as when loading the machine.

17. In a manifolding machine, the combination of a main frame; a platen frame over which a plurality of superposed webs is fed, said platen frame being pivotally mounted on the main frame; means mounted on the platen frame for tensioning the webs as the latter approach the platen; and means on the main frame for making the tension-producing means operative when the platen frame is in operative position and inoperative when the platen frame is in inoperative position.

18. In a manifolding machine, the combination of a main frame; a platen frame over which a plurality of superposed webs is fed, said platen frame being pivotally mounted on the main frame; means mounted on the platen frame for tensioning the webs as the latter approach the platen; a plate secured to the main frame; and means interconnecting said plate and the tension-producing means for making the latter operative when the platen frame is swung to operative position on the main frame.

19. In a manifolding machine, the combination of a main frame; a platen frame over which a plurality of superposed webs is fed, said platen frame being pivotally mounted for movement from operative to inoperative position to facilitate loading the machine with a supply of webs; means engaging the webs as they approach the platen to tension the same; and means operated as an incident to the movement of the platen frame to inoperative position to make said tensioning means inoperative to facilitate the passage of the ends of the webs to the platen frame and operative as an incident to the return of the platen frame to normal operative position

after causing the tensioning means to again become operative.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 16th day of June, 1927.

ARTHUR A. JOHNSON.

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