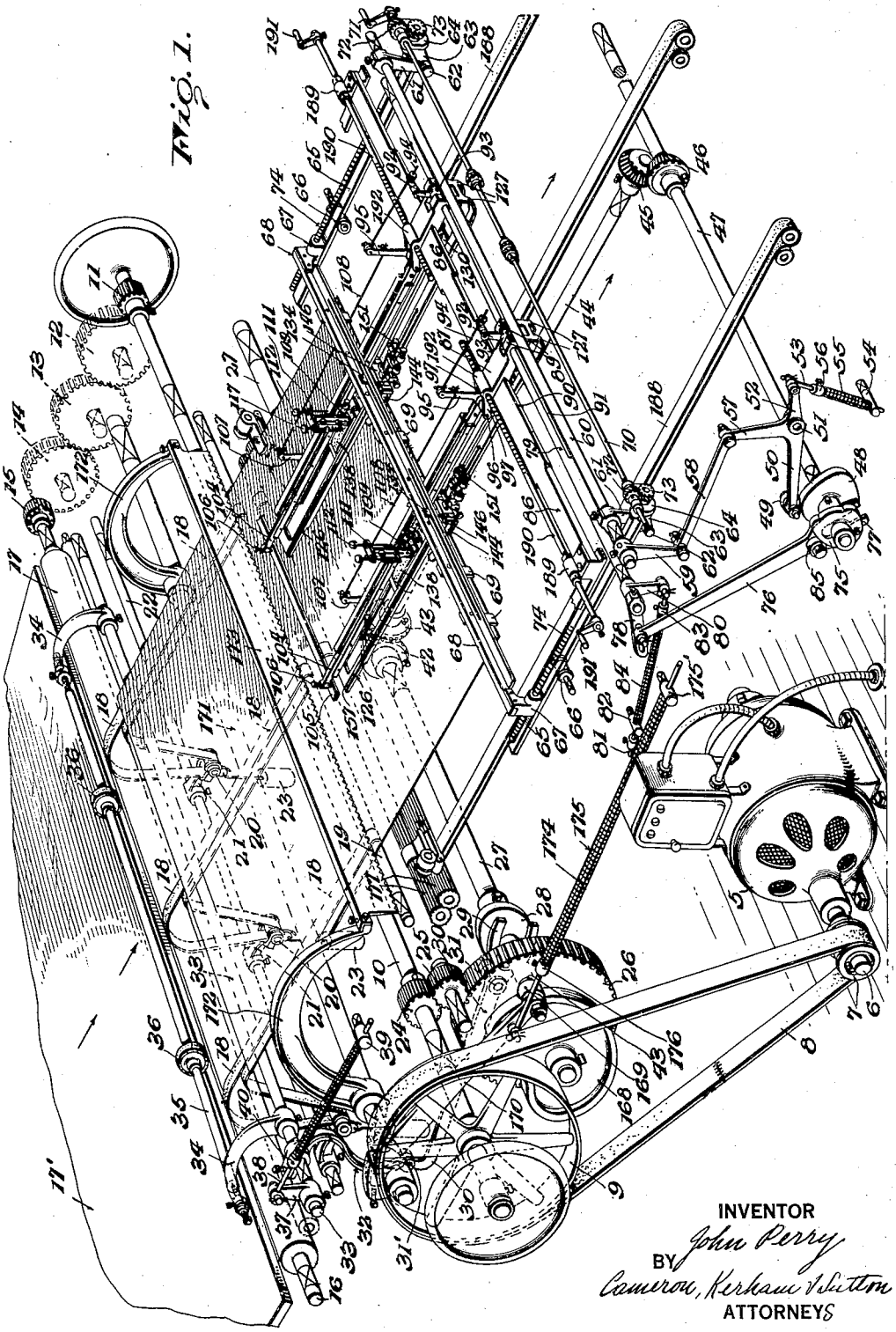
Aug. 8, 1933. J. PERRY 1,921,167

SHEET FEEDING APPARATUS

Original Filed July 13, 1928 3 Sheets-Sheet 1

Fig. 1.



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SHEET FEEDING APPARATUS

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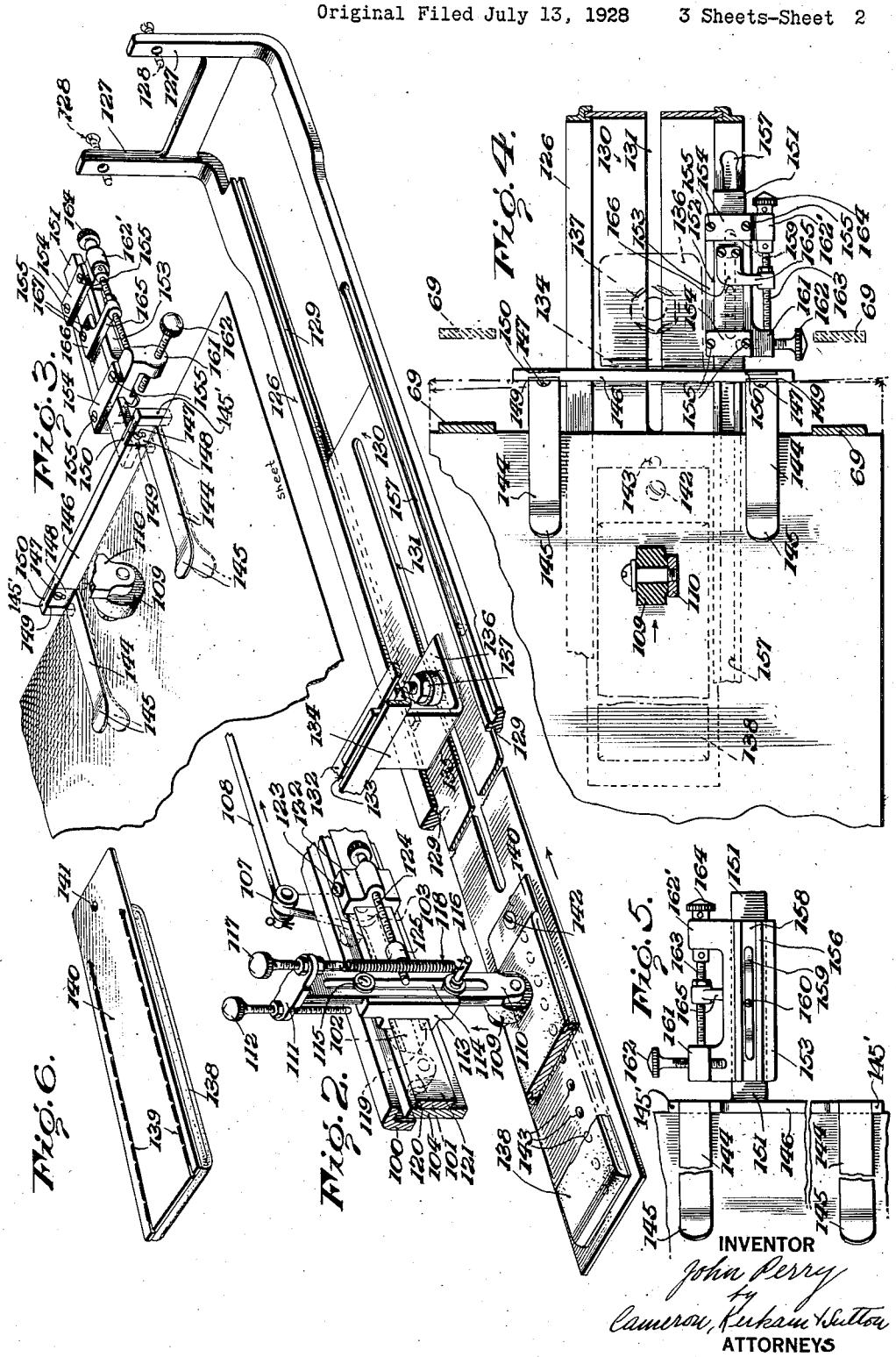


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 2.

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SHEET FEEDING APPARATUS

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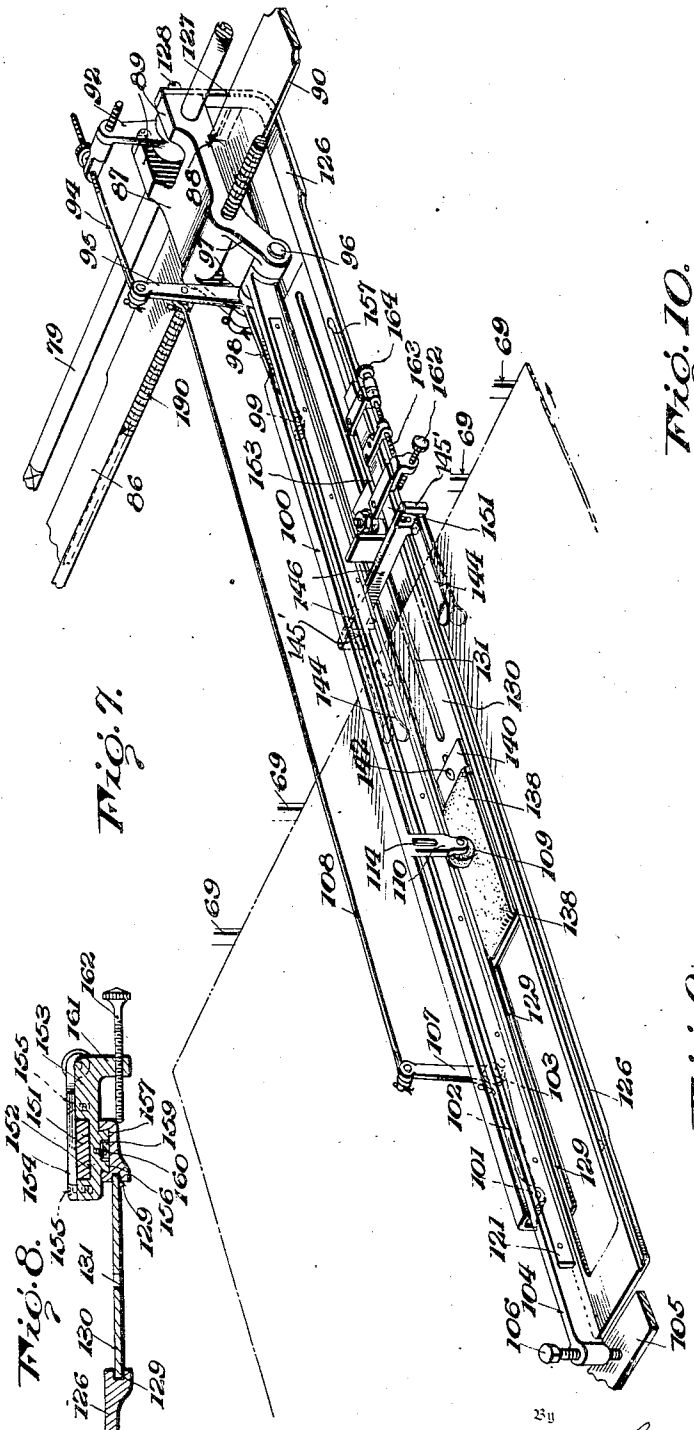


Fig. 7.

Fig. 8.

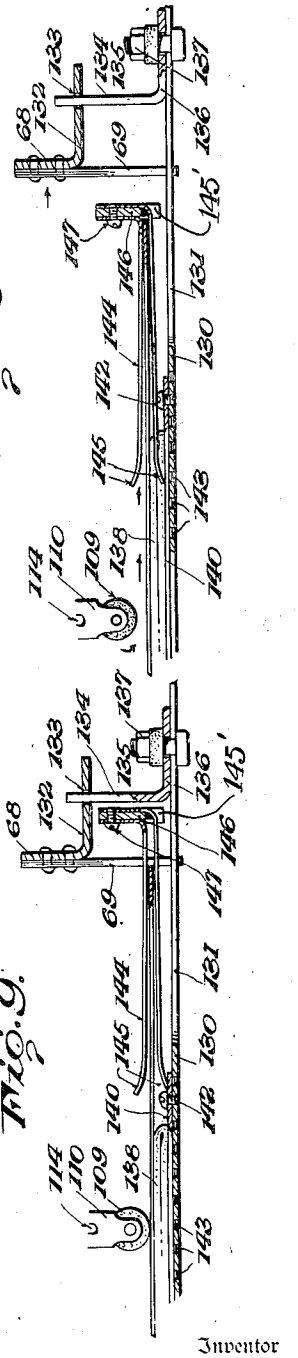


Fig. 10.

Fig. 9.

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UNITED STATES PATENT OFFICE

1,921,167

SHEET FEEDING APPARATUS

John Perry, Pearl River, N. Y., assignor to Dexter Folder Company, New York, N. Y., a Corporation of New York

Application July 13, 1928, Serial No. 292,510
Renewed October 19, 1931

42 Claims. (Cl. 271—50)

This invention relates to sheet pull-up and registering devices adapted for association with sheet feeders, folders, or any instrumentality where the use of said devices is desirable.

One object of the invention is to provide sheet pull-up and registering devices that will efficiently and accurately register relatively thin sheets such as Bible stock or the like.

Another object of the invention is to provide devices that support the leading edge of the sheet and operate through frictional engagement therewith, to pull it up to the sheet registering devices without crumpling or tearing the sheet.

A further object of the invention is to provide means for accurately registering the sheet after it engages front stops and is pulled up to said means by the pull-up devices.

Another object of the invention is to provide sheet pull-up and registering devices that are adjustable to accommodate sheets of various sizes and wherein the frictional engagement of the pull-up devices with the sheet may be varied as desired.

Other objects of the invention will appear as the following description thereof proceeds.

In order to more clearly understand the invention reference may be had to the accompanying drawings which illustrate one embodiment of the inventive idea and wherein:

Fig. 1 is detail perspective view of a paper folding machine equipped with sheet pull-up and registering mechanism embodying the present invention.

Figs. 2 and 3 are enlarged perspective views with parts omitted, of sheet pull-up and registering devices respectively, illustrated in Fig. 1.

Figs. 4 and 5 are top and bottom plan views respectively of the sheet registering device, shown in Figs. 1 and 3;

Fig. 6 is a detail perspective view of a friction pad forming part of the sheet pull-up device;

Fig. 7 is an enlarged detail perspective view of a sheet pull-up device and associated sheet registering device;

Fig. 8 is a transverse vertical sectional view of parts of the sheet pull-up and registering devices.

Fig. 9 is a fragmentary side elevation, partly in section, of the sheet pull-up and registering devices, showing the sheet engaged with front stops moved rearwardly of the sheet registering device; and

Fig. 10 is a view similar to Fig. 9, showing the front stops moved forwardly of the sheet registering device and the sheet pulled up thereto.

Referring to the drawings, wherein like reference characters designate like parts throughout the several views, 5 indicates a suitable source of power preferably comprised by an electric motor the armature shaft 6 of which has fixed thereon a pulley 7. Passing around the pulley 7 is a belt 8 that also passes around a pulley 9 fixed on one end of a main power shaft 10 journaled in suitable bearings on the side frames (not shown) of a paper folding machine.

Fixed on the opposite end of the shaft 10 is a pinion 11 that meshes with an idler gear 12 which in turn meshes with an idler gear 13 that meshes with an idler gear 14. These idler gears are journaled in suitable bearings on one of the side frames of the machine, and the idler gear 14 meshes with a pinion 15 fixed on a feed roller shaft 16 that is also journaled in suitable bearings on said side frames. The shaft 16 carries a feed roller 17, and passing around said roller are tapes 18 that also pass around a roller 19 journaled in suitable bearings on the machine framework and around rollers 20 carried on arms 21. The arms 21 are fixed on a rock shaft 22 journaled in suitable bearings on the machine framework and said arms carry weights 23 which normally act to depress the arms 21 and the rollers 20 so as to take up the slack in the tapes 18.

The sheets are fed from any suitable source of supply to the feed roller 17 and tapes 18 and the latter carry the successive sheets forward from a feed board 17' to movable front stops hereinafter described. As herein shown, a drop roller mechanism is employed in conjunction with the feed roller 17 and said mechanism comprises and is operated by the following instrumentalities. Fixed on the main power shaft 10 is a pinion 24 that meshes with an idler pinion 25 journaled on one of the side frames of the machine. This idler pinion 25 meshes with a large gear 26 fixed on one end of a driven shaft 27 that is journaled in suitable bearings on the machine framework. The shaft 27 has fixed thereon adjacent the gear 26, a cam 28, and straddling said shaft between the gear 26 and the cam 28, is a fork 29 formed on one end of a link 30 which carries a roller 31 that is spring-pressed into engagement with the cam 28 by means to be presently described. The link 30 is pivotally connected at 31' with an arm 32 that is fixed on a rockshaft 33 journaled in suitable bearings on the machine framework. Fixed on the rockshaft 33 are arms 34 that carry a rod 35 on which are mounted drop-rollers 36 that are raised by the cam 28 when the sheet is fed between the feed

roller 17 and said drop-rollers. The drop-rollers 36 are then lowered through the medium of an arm 37 that is fixed on the rockshaft 33 and operated rearwardly by a spring-pressed rod 38, one end of which is pivotally connected to said arm. The opposite end of the rod 38 extends through a suitable opening formed in a stud 39 on the machine framework. Carried on the rod 38 between a collar 40 thereon and the stud 39, is a coil spring 41 which is compressed when the drop-rollers are raised and thereafter acts to lower said rollers as described. The sheet is then fed forwardly to the front stops, to be acted on by pull-up, registering, and folding devices hereinafter described.

The front stops are preferably comprised by and operated through the medium of the following instrumentalities. Fixed on the driven shaft 27 is a bevel gear 42 which meshes with a bevel gear 43 that is fixed on one end of a shaft 44 journaled in suitable bearings on the machine and extending longitudinally thereof substantially at right angles to the shaft 27. Fixed on the opposite end of the shaft 44 is a bevel gear 45 that meshes with a bevel gear 46 rigidly secured on a shaft 47 extending transversely of the machine and journaled in suitable bearings on the framework thereof. This shaft 47 has fixed on one end thereof, a cam 48 that engages a spring-pressed roller 49 carried on one arm 50 of a double bell crank lever pivoted at 51 on a stationary part of the machine. A second arm 52 of this bell crank lever has pivotally connected therewith one end of a rod 53 the opposite end of which extends through a suitable opening in a stud 54 carried on one of the side frames of the machine. Carried on the rod 53 is a coil spring 55 one end of which abuts against the stud 54, the opposite end of said spring abutting a collar 56 fixed on the rod 53. It will thus appear that the bell crank 50, 52 is cam operated in one direction and spring-operated in the opposite direction so that the roller 49 always follows the cam 48. A third arm 57 of the double bell crank lever has pivotally connected therewith one end of a link 58 the opposite end of which is pivotally connected with an arm 59 that is fixed on one extremity of a rockshaft 60 extending transversely of the machine and journaled in suitable bearings on the side frames thereof. Fixed on the rockshaft 60 adjacent opposite ends thereof are arms 61 the free ends of which are pivotally connected at 62 with extensions 63 of U-shaped brackets 64. The brackets 64 are secured to, or formed integrally with, bars 65 that are reciprocated on rollers 66 journaled in suitable bearings on the side frames of the machine.

Mounted on the bars 65 for reciprocating movement therewith and adjustment longitudinally thereof, are brackets 67 and secured to said brackets is a bar 68 that extends transversely of the machine and carries the front stops 69. In the operation of the machine, the front stops 69 move rearwardly to be engaged by the leading edge of the sheet, whereupon said stops are moved forwardly and the drop rollers 36 are raised, to provide for the operation of the pull-up and sheet registering devices on the first sheet and the feeding of the next sheet forwardly from the feed board 17'. This rearward and forward movement of the front stops 69 is effected by the described connections therefor with the bell crank 50, 52, 57 that is rocked by the cam 48 and the spring 55. In accordance with the present invention, the operative position of the stops 69 may be changed as desired to accommodate sheets of different sizes and this is preferably effected through the medium of the following instrumentalities.

Journaled in suitable bearings on the brackets 64 is a shaft 70 having secured on one end thereof a crank handle 71 for turning said shaft. Fixed on the shaft 70 between the arms of the brackets 64 are worm gears 72 that mesh with worm gears 73 fixed on screw shafts 74 extending at right angles to the shaft 70 and threaded through suitable screw threaded openings in the brackets 67. It will thus appear, that when the shaft 70 is rotated by the crank handle 71, the brackets 67 will slide along the bars 65 in a direction corresponding with the direction of rotation of the shaft 70, whereupon the bar 68 and the stops 69 will likewise be moved to change the position of the latter in accordance with the size of the particular sheet that it is desired to handle in the machine.

After the stops 69 are moved rearwardly, the pull-up devices above referred to act on the sheet to pull it up to the sheet registering devices. In the preferred embodiment of the invention illustrated in the drawings, two pull-up and sheet registering devices are employed, the same being adjustable toward and away from each other to accommodate sheets of various sizes and each carrying one of the sheet registering devices. The construction and operation of the two sheet pull-up and registering devices, together with the adjusting mechanisms therefore, are identical and it is therefore only necessary to describe one of the same. The pull-up devices preferably comprise and are operated through the medium of the following instrumentalities. Fixed on the shaft 47 is a cam 75 between which and the cam 48 is arranged a link 76 having a forked end 77 engaged over the shaft 47. The opposite end of the link 76 is pivotally connected with one arm 78 of a bell crank that is rigidly secured on a rockshaft 79 extending transversely of the machine and journaled in suitable bearings on the framework thereof. The other arm 80 of this bell crank has pivotally connected therewith one end of a rod 81 the opposite end of which extends through a suitable opening in a stud 82 carried by one of the side frames of the machine. Mounted on the rod 81 between a collar 83 thereon and the stud 82 is a coil spring 84. The link 76 carries a roller 85 that is caused to follow the cam 75 by the spring 84. It will thus appear that the rockshaft 79 will be cam operated in one direction and spring-operated in the opposite direction as the shaft 47 is rotated through the described driving connections therefor with the shaft 27.

Fixed on the side frames of the machine and extending transversely thereof is a bar 86 arranged in substantially parallel relation with the rockshaft 79. Mounted on the bar 86 and the rockshaft 79, for adjustment laterally of the machine, is a bracket 87 having a dove-tailed slot 88 and spaced apertured ears 89. The slotted portion 88 of the bracket 87 is slidably engaged over beveled edges 90 of the bar 86 and the rockshaft 79 extends through the apertures in the ears 89 and is provided with a longitudinal keyway 91 as clearly shown in Fig. 1 of the drawings. Mounted on the rockshaft 79 between the ears 89 and the bracket 87 is an arm 92 having a key or pin 93 engaged in the keyway 91 of the rockshaft 79. Attached to the arm 92 is one end of a connection 94 the opposite end of which is secured to an arm 95 of a bell crank 96 mounted on

the bracket 87 in suitable openings formed in spaced ears 97 of said bracket (Figs. 1 and 7). The other arm 98 of the bell crank lever 96 is pivotally connected with a depending ear 99 of an L-shaped bar 100 that has a second depending ear 101 pivotally connected with one arm 102 of a bell crank 103.

The bell crank 103 is mounted on a bar 104 having one end loosely mounted on the bell crank 96 and the opposite end supported on a cross bar 105 that extends transversely of the machine and is supported on the side frames thereof. The end of the bar 104 supported on the cross bar 105 is provided with an adjusting screw 106 that engages the cross bar 105 and can be turned to raise or lower the bar 104 about the pivot therefor provided by the bell crank 96. The other arm 107 of the bell crank 103 has attached thereto one end of a connection 108 the opposite end of which is secured to the arm 95 of the bell crank 96. It will thus appear that rocking motion of the shaft 79 acts through the connections therefor with the bar 100 to raise and lower the latter at certain intervals during the operation of the machine. This up and down movement of the bar 100 is utilized to intermittently raise a roller 109 which in its operative or lowermost position acts to hold the sheet in frictional engagement with the pull-up device proper. The roller 109 is journaled on the lower end of a slide 110 (Fig. 2) that is provided at its upper end with a plate 111 carrying at one side thereof an adjusting screw 112 that engages the bar 100 and regulates the amount of upward movement imparted thereby to said roller. The slide 110 is guided on a bracket 113 carried by the bar 104, said slide having a slot 114 through which projects pins 115 and 116 that are secured to the bracket 113 and act to retain the slide 110 thereon as clearly shown in Fig. 2 of the drawings. The plate 111 also carries an adjusting screw 117 having connected therewith one end of a coil spring 118, the opposite end of which is connected with the pin 116. The spring 118 acts to lower the roller 109 in engagement with the sheet, the screw 117 being adjustable to vary the tension of the spring 118 in accordance with the adjustment of the screw 112.

The bracket 113 is provided with a dove-tail slot 119 engaged over the beveled edges 120 of a guide plate 121 secured to the bar 104. A guide block 122 carried by the guide plate 121 is adjustable along the latter and may be secured in any desired position of adjustment by a set screw 123. Journaled in a suitable bearing on the guide block 122 is a screw shaft 124 that is threaded in a boss 125 formed on the bracket 113. It will thus appear, that in addition to the adjustment of the bracket 113 and roller 109 provided by the guide block 122, said bracket and roller may be further and more accurately adjusted forwardly or rearwardly as desired by rotating the screw 124 in the proper direction.

The pull-up device proper is preferably carried by a horizontally extending frame-like bracket 126 provided at one end with upwardly bent arms 127 secured to the front face of the bracket 87 as by machine screws 128. The bracket 126 is further provided with opposed parallel guide slots 129 in which is slidably mounted a plate 130 provided at one end with a slot 131 extending longitudinally thereof. During the operation of the machine, this plate 130 is reciprocated in the guide slots 129 by the bar 68 which for this purpose is provided with a flange 132 having a slot 133 therein through which extends a vertical arm 134 of an L-shaped bracket indicated broadly at 135. The other or horizontal arm 136 of said bracket is secured to the plate 130 by a bolt 137 that extends through the slot 131 and by means of which the plate 130 may be adjusted rearwardly or forwardly relative to the bar 68 to accommodate sheets of various sizes. On the end of the plate opposite that provided with the slot 131, is mounted a pull-up member which is preferably comprised by a friction pad 138 of leather or suitable material that is secured in any suitable manner, as by stitching 139 (Fig. 6), to a plate 140. The plate 140 is provided in one end thereof with an opening 141 for a set screw 142 which may be secured in any one of a series of screw threaded openings 143 formed in the end of the plate 130 carrying the pad 138. It will thus appear that the pad 138, through the medium of the set screw 142 and threaded openings 143, may be adjusted to any desired position longitudinally of the plate 130. As the sheet is fed forwardly by the conveyor tapes 18, it passes over and is supported by the pad 138 until the leading edge of the sheet engages the front stops 69. At this time, the roller 109, through the operating connections therefor with the rock shaft 79, lowers into engagement with the sheet on the pad 138, whereupon the front stops 69 and the bar 68 are moved forwardly carrying therewith the plate 130. The sheet being frictionally engaged between the roller 109 and the pad 138, is thus pulled up by the latter to the sheet registering devices each of which is mounted on one of the brackets 126 and preferably comprises the following devices.

Two spaced pairs of spring metal clips 144 (Figs. 3, 4, 5, 7, 9 and 10) have outwardly bent ends 145 into which the leading edge of the sheet is pulled by the pull-up device 138. As said edge of the sheet advances between the arms of the spring clips 144, it engages points or lugs 145' of a sheet registering bar 146 to the opposite extremities of which are secured, as by set screws 147, the upwardly bent forward ends 148 of the spring clips 144 (Fig. 3). The bent up forward ends 148 of said clips are preferably received in slots 149 and 150 formed in the rear and front faces respectively of the sheet register bar 146, these slots serving to prevent turning movement of the spring clips 144 so that the latter are always maintained in proper position to receive the leading edge of the sheet. The sheet registering bar 146 is secured to or formed integrally with a bar 151 slidably mounted in a groove 152 formed in a bracket 153 that is slidably mounted on one side of the bracket 126, the bar 151 being retained on bracket 153 as by plates 154 and set screws 155. The bracket 153 is provided on its under side with a beveled tenon 156 that is slidably mounted on the bracket 126 in a dove-tail slot 157 formed on one side of said bracket at the top thereof. Formed in the tenon 156 is a slot 158 for a leaf spring 159 that is secured to the bracket 153 by a screw 160 and frictionally engages the bottom of the dovetail slot 157. The bracket 153 is provided with a boss 161 through which is threaded a set screw 162 adapted to engage the bracket 126 to hold the bracket 153 and the sheet registering bar 146 in any desired position of adjustment on the bracket 126. Rotatably mounted in a boss 162' of the bracket 153 is a screw shaft 163 provided at one end with a turning knob 164. This screw shaft 163 is threaded through a suitable opening in the end of an arm 165 of a small bracket 166 that is

secured as by set screws 167 to the bar 151. It will thus appear, that by rotating the screw shaft 163, a further and more accurate adjustment of the sheet registering device 146 may be obtained if desired.

Through the medium of the screws 106, 112 and 117, the roller 109 and the friction pad 138 may be adjusted relatively to obtain frictional engagement between these elements that is sufficient to pull the sheet up against the sheet registering devices and at the same time allow for slippage between said elements in the event one side of the sheet is pulled up against one sheet registering device before the opposite side of the sheet is pulled up to the other sheet registering device. For example, if a sheet is fed to the sheet registering devices out of alignment therewith, the leading edge of the sheet will engage one sheet registering device before it engages the other sheet registering device. In this event, the roller 109 and pad 138 at the side of the sheet engaged with the first sheet registering device, will slide relatively to the sheet to prevent crumpling or tearing thereof, and the opposite side of the sheet will be acted on by the corresponding pull-up device until the leading edge of the sheet is brought up against both of the sheet registering devices. This is illustrated diagrammatically in Fig. 4 by dotted lines which show, for example, the position of the leading edge of the sheet in and out of alignment respectively with the side registering devices. After the sheet has been properly registered, the roller 109, through the connections therefor with the rockshaft 79, is lifted, at which time the sheet may be folded by any suitable means for this purpose.

The folding means herein shown preferably comprises and is operated by the following instrumentalities. Fixed on the shaft 27 is a cam 168 that engages a roller 169 journaled on the free end of an arm 170 that is fixed on one extremity of a rockshaft 171 extending transversely of the machine and journaled in suitable bearings on the side frames thereof. Rigidly secured on the rockshaft 171 adjacent opposite ends thereof, are curved arms 172 that carry a folding knife 173 which, during the operation of the machine, is raised and lowered by the arm 170 through the medium of the cam 168 and a spring-pressed rod 174. One end of this rod 174 is pivotally connected with the arm 170, the opposite end of said rod extending loosely through a suitable opening in a stud 175' carried by one of the side frames of the machine. Mounted on the rod 174 between a collar 176 thereon and the stud 175', is a coil spring 175 which is compressed when the high part of the cam 168 engages the roller 169 to lift the folding blade 173. After the sheet has been registered as above described, the low part of the cam engages the roller 169 whereupon the spring 175 causes said roller to follow the cam and depress the arm 170 which then lowers the folding blade 173. As the folding blade 173 descends, it engages the registered sheet between the bight of a pair of driven folding rollers 177. These rollers 177 deliver the folded sheets onto conveyor tapes 188 that carry the sheet to a second folding mechanism or to any desired point of delivery for the sheets. The folding rollers 177 and the tapes 188 are arranged and operated in a well known manner and since they form no part of the present invention it is not necessary to describe the same in detail.

The pull-up and sheet registering devices, as previously mentioned, are relatively adjustable laterally of the machine to accommodate various sizes of sheets. For this purpose, the bar 86 is provided at the ends thereof with brackets 189 in which are journaled screw shafts 190 the outer ends of which carry crank handles 191. These screw shafts 190 are threaded through bosses 192 on the brackets 87, and it will thus appear, that by turning said screw shafts, the brackets 87 and the various parts of the sheet pull-up and registering devices can be adjusted laterally of the machine as desired.

The operation of the sheet pull-up and registering devices will be clearly understood from the foregoing and may be briefly summarized as follows. After the sheet has been fed between the feed roller 17 and the drop rollers 36, the latter descend to engage the sheet with said feed roller which, through the medium of the tapes 18, then advances the sheet so that the leading edge thereof passes over the friction pads 138 and under the rollers 109 which at this time are separated by raising movement of the bar 100. The rollers 109 are then lowered into engagement with the sheet, whereupon the front stops 69 are moved forwardly carrying with them the plates 130 and the friction pads 138. Through the frictional engagement between the rollers 109 and the pads 138, the sheet is advanced or pulled up by the plates 130 until the leading edge of the sheet passes between the opposed arms of the spring clips 144 and engages the sheet registering bars 146. After the sheet is properly registered against the bars 146, the rollers 109 are lifted by the bar 100, whereupon the folder blade 173 descends and folds the sheet in the bight of the rollers 177 which then deliver the folded sheet to the tapes 188.

It will appear from the foregoing that mechanism embodying the present invention will pull and straighten up the sheet without danger of tearing the same, and that through the various adjustments provided for the mechanisms, an extremely accurate register of the sheet is obtained. Moreover, the pull-up devices for the sheets in addition to their primary function, also act to support the leading edge of the sheet prior to acting on the same, which is a desirable function in the case of relatively thin sheets that otherwise would require independent supporting means therefor.

While the invention has been described particularly as respects application thereof to a knife folding machine, it will of course be understood that the invention may be employed in other types of folding machines, or with various types of sheet feeders, or with any instrumentality where the use of pull-up and sheet registering devices is desirable. Moreover, while one embodiment of the invention has been illustrated in the accompanying drawings, it is to be expressly understood that the invention is not limited thereto or otherwise than by the terms of the appended claims.

What is claimed is:

1. The combination with sheet feeding means and sheet registering means, of a reciprocating front stop movable bodily past said sheet registering means and adapted to stop the sheet rearwardly thereof, and means for pulling said sheet up to the sheet registering means comprising a pull-up member arranged to engage the under side of the sheet on the forward part thereof and connected with said reciprocating front stop.

2. The combination with sheet feeding means and sheet registering means, of a reciprocating

front stop movable bodily past said sheet registering means and adapted to stop the sheet rearwardly thereof, means for pulling the sheet up to the sheet registering means comprising a pull-up member connected with said reciprocating front stop and receiving the sheet from said sheet feeding means, and an element movable toward and away from the pull-up member and adapted to engage the sheet with said member while the same is pulling said sheet up to the sheet registering means.

3. The combination with sheet feeding means and relatively adjustable sheet registering devices, of one or more reciprocating front stops movable bodily past said devices and adapted to stop the sheet rearwardly thereof, and means for pulling the sheet up to the sheet registering devices comprising one or more pull-up members arranged to engage the under side of the sheet on the forward part thereof and connected with said reciprocating front stop or stops.

4. The combination with sheet feeding means and sheet registering means, of one or more reciprocating front stops movable bodily past said sheet registering means and adapted to stop the sheet rearwardly thereof, and a plurality of relatively adjustable pull-up members arranged to engage the under side of the sheet on the forward part thereof, said pull-up members being connected with said reciprocating front stop or stops and adapted to pull said sheet up to the sheet registering means.

5. The combination with sheet feeding means and sheet registering means, of reciprocating means movable bodily past said sheet registering means and adapted to stop the sheet rearwardly thereof, and a plurality of relatively adjustable mechanisms each comprising a pull-up member connected with said reciprocating means and adapted to pull said sheet up to the sheet registering means and an element movable toward and away from the pull-up member and adapted to engage the sheet with said member while the same is pulling the sheet up to the sheet registering means.

6. The combination with sheet feeding means and sheet registering means, of adjustably mounted reciprocating means movable bodily past said sheet registering means and adapted to stop the sheet rearwardly thereof, a plurality of pull-up members connected with said adjustably mounted reciprocating means and adapted to pull the sheet up to said sheet registering means, and a corresponding number of elements movable towards and away from said pull-up members and adapted to engage the sheet with said members while the same are pulling the sheet up to the sheet registering means.

7. The combination with sheet registering means and means for feeding sheets toward the same, of a reciprocating front stop movable bodily past the sheet registering means and adapted to stop the sheet rearwardly thereof, means for pulling the sheet up to the sheet registering means comprising a pull-up member connected with said reciprocating front stop and over which the sheet is fed by said sheet feeding means, and a slidably mounted element movable toward and away from the pull-up member and adapted to engage the sheet with said member while the same is pulling the sheet up to the sheet registering means.

8. The combination with sheet registering devices and means for feeding sheets toward the same, of reciprocating sheet stops arranged to move past said sheet registering devices and adapted to stop the sheet rearwardly thereof, means for pulling the sheet up to the sheet registering devices comprising a reciprocating pull-up member over which the sheet is fed by said sheet feeding means, and a slidably and rotatably mounted roller movable toward and away from the pull-up member and adapted to engage the sheet with said member while the same is pulling the sheet up to the sheet registering devices.

9. The combination with sheet registering means and means for feeding a sheet toward the same, of reciprocating means movable past said sheet registering means and adapted to stop the sheet rearwardly thereof, a bracket carrying the sheet registering means, means for pulling said sheet up to the sheet registering means comprising a pull-up member mounted on said bracket and connected with said reciprocating means, and an element movable toward and away from the pull-up member and adapted to engage the sheet with said member while the same is pulling the sheet up to the sheet registering means.

10. The combination with a sheet registering device and means for feeding a sheet toward the same, of reciprocating sheet stops movable past said sheet registering device and adapted to stop the sheet rearwardly thereof, a bracket on which the sheet registering device is mounted for adjustment longitudinally of the machine, and means for pulling the sheet up to said sheet registering device comprising a pull-up member slidably mounted on said bracket and connected with said reciprocating sheet stops.

11. In combination, a bracket, sheet registering means carried thereby, and reciprocating means on said bracket adapted to pull a sheet up to said sheet registering means.

12. In combination, a bracket, sheet registering means adjustable along said bracket, a member slidably mounted on the bracket and adapted to pull a sheet up to the sheet registering means, and means for reciprocating said member.

13. In combination, reciprocating stop means, a bracket adjacent thereto, sheet registering means carried by the bracket, and a sheet pull-up member adjustably connected with said stop means and movable thereby along said bracket.

14. In combination, sheet pull-up means, a bracket carrying the same, sheet registering means mounted on said bracket and receiving the sheet from the pull-up means, and means for adjusting the sheet registering means along said bracket.

15. In combination, a support, a sheet registering device carried thereby, a reciprocating front stop movable in opposite directions past said sheet registering device, and means adapted to pull a sheet up to the sheet registering device comprising a member connected with the reciprocating front stop and an element movable toward and away from said member.

16. In combination, a support, a bracket slidable along said support to various positions of adjustment, sheet registering means slidably mounted on said bracket, and means for adjusting said sheet registering means along the bracket in any position of adjustment thereof.

17. In combination, a support, a bracket slidably mounted thereon, means for securing the bracket in any desired position on the support, sheet registering means slidable along said bracket, and means for adjusting the sheet registering means along the bracket comprising a screw shaft journalled on the slidably mounted

bracket and having threaded engagement with said sheet registering means.

18. In combination, a support having a groove or slot therein, a bracket having a tenon slidably fitted in said groove or slot and a spring receiving recess in said tenon, a spring secured to the tenon in said recess and frictionally engaging a wall of the groove or slot formed in the support, and sheet registering means carried by said bracket and slidable therewith along said support.

19. In combination, an open frame-like support, a bracket mounted on and adjustable along one side of said support, sheet registering means carried by the bracket, and means for securing said bracket and the sheet registering means in any desired position of adjustment on said side of the support.

20. In combination, sheet registering means, a sheet pulling device adapted to pull a sheet into engagement with the sheet registering means, sheet feeding means adapted to feed the sheet over and upon the sheet pulling device, movable means arranged to travel in opposite directions past the sheet registering means and adapted to be engaged by the sheet before said sheet engages said sheet registering means, and means connecting said movable means with said sheet pulling means to operate the latter.

21. In combination, sheet registering means, a sheet puller adapted to pull a sheet into engagement with the sheet registering means, a device movable with and relative to the sheet puller and adapted to maintain the sheet in engagement therewith during the sheet pulling operation, and movable means arranged to travel in opposite directions past the sheet registering means and adapted to be engaged by the sheet before said sheet engages said sheet registering means.

22. In combination, a reciprocating member, sheet registering means past which the member moves in opposite directions, sheet pulling means adapted to pull a sheet into engagement with the sheet registering means, and means connecting said reciprocating member with said sheet pulling means to operate the latter.

23. In combination, sheet registering means, a slotted sheet pulling device adapted to pull a sheet into engagement with the sheet registering means, a sheet stop traveling in opposite directions past the sheet registering means and engaged by the sheet before it is engaged and registered by said means, and means for operating the sheet pulling device connected through the slot thereof with said sheet stop.

24. In combination, sheet registering means, a sheet pulling device adapted to pull a sheet into engagement with the sheet registering means, a sheet stop movable in opposite directions past the sheet registering means and engaged by the sheet before it is engaged and registered by said means, mechanism for reciprocating the sheet stop, and connections between the sheet stop and said sheet pulling device for operating the latter.

25. In combination, a slotted reciprocating element, a sheet stop thereon, sheet registering means past which the sheet stop is moved in opposite directions by the reciprocating element, a slotted pull-up device adapted to move the sheet into engagement with the sheet registering means, and means for operating the pull-up device from the reciprocating element and comprising connections between said element and said device and extending through the slots thereof.

26. In combination, a slotted reciprocating element, a sheet stop thereon, sheet registering means past which the sheet stop is moved in opposite directions by the reciprocating element, a slotted pull-up device adapted to pull the sheet into engagement with the sheet registering means, and means adjustably connecting the reciprocating element with the pull-up device for operating the latter and comprising a bracket extending through the slot of said reciprocating element and connections between said bracket and said pull-up device and extending through the slot of the latter.

27. In combination, sheet registering means, sheet stopping means movable forwardly and rearwardly thereof, sheet moving means adapted to engage the sheet with the sheet stopping means when the latter is moved rearwardly of the sheet registering means, and other means onto which the sheet is moved forwardly by the sheet moving means and adapted to support said sheet and move it into engagement with said sheet registering means when the sheet stopping means is moved forwardly thereof.

28. In combination, sheet registering means, sheet stopping means movable in opposite directions past the sheet registering means, sheet moving means adapted to engage a sheet with the sheet stopping means when the latter is moved in one direction past the sheet registering means, and means onto which a sheet is moved by said sheet moving means and adapted to support said sheet and pull it into engagement with the sheet registering means when the sheet stopping means is moved in the opposite directions past the same.

29. In combination, sheet registering means, endless sheet feeding means, reciprocating means onto which a sheet is fed by said endless sheet feeding means and adapted to support said sheet and move it into engagement with the sheet registering means, and sheet stopping means movable in opposite directions past the sheet registering means so as to be engaged by the sheet before it engages said sheet registering means.

30. In combination, sheet registering means, sheet feeding means, movable means onto which a sheet is fed by said sheet feeding means and adapted to support said sheet and pull it into engagement with the sheet registering means, and sheet stopping means movable forwardly and rearwardly of the sheet registering means so as to be engaged by the sheet before it engages said sheet registering means.

31. In combination, a pair of spaced sheet registering means, sheet stopping means mounted exteriorly of and between the two spaced sheet registering means and movable in opposite directions past the same, reciprocable means adjacent the path of travel of a sheet fed to the sheet stopping means and adapted to support said sheet and move it into engagement with the sheet registering means, and means for moving the sheet stopping means as aforesaid so that the sheet engages said sheet stopping means before engaging said sheet registering means.

32. The method of handling sheets, which consists in moving a sheet, temporarily engaging its leading edge along a portion thereof extending across and at opposite sides of the longitudinal center line of said sheet, and registering the sheet by further moving it and engaging its leading edge at points thereon spaced from and located at opposite sides of said line.

33. The method of handling sheets, which consists in moving a sheet, temporarily stopping the

sheet by temporarily engaging its leading edge along a portion thereof extending across and at opposite sides of the longitudinal center line of said sheet, further moving the sheet, and registering said sheet by engaging its leading edge at points thereon spaced from and located at opposite sides of said line.

34. The method of handling sheets, which consists in moving a sheet, temporarily engaging its leading edge along a portion thereof extending across and at opposite sides of the longitudinal center line of the sheet, and stopping and registering said sheet by engaging its leading edge at points thereon spaced from and located at opposite sides of said line.

35. The method of handling sheets, which consists in moving the sheet, temporarily stopping the sheet by temporarily engaging its leading edge along substantially the entire length thereof, and finally stopping and registering the sheet by further moving said sheet and engaging its leading edge at points thereon spaced from and located at opposite sides of the longitudinal center of the sheet.

36. In a machine of the class described, means for moving a sheet in the direction of a center line thereof, a plurality of registering means to which the sheet is moved by said sheet moving means and spaced apart to engage the sheet at points on its leading edge spaced from and located at opposite sides of said line, movable stop means extending across the space between the sheet registering means exteriorly thereof and adapted to be engaged by the sheet along the portion of said edge between said points, and means for moving the stop means into and out of the space traversed by said edge portion of the sheet and enabling the sheet to engage said stop means and said sheet registering means successively.

37. In a machine of the class described, means for moving a sheet in the direction of a center line thereof, a plurality of sheet registering means to which the sheet is moved by said sheet moving means and spaced apart to engage the sheet at points on its leading edge spaced from and located at opposite sides of said line, stop means extending across the machine exteriorly of the spaced sheet registering means, said stop means being movable past said sheet registering means in opposite directions and adapted for engagement by the sheet along the portion of said edge between said points, and mechanism for moving the stop means as aforesaid and into and out of the space traversed by said edge portion, whereby the sheet may engage said stop means and said sheet registering means successively.

38. In a machine of the class described, means for moving a sheet in the direction of a center line thereof, a pair of aligned sheet registering devices to which the sheet is moved by the sheet moving means and spaced apart for engagement by the sheet at points on its leading edge spaced from and located at opposite sides of said line respectively, movable stop means extending transversely of the machine between and at the outer sides of the two sheet registering devices and adapted for engagement by the sheet along substantially the entire leading edge portion thereof, and means for moving the transversely extending stop means into and out of the space traversed by said edge portion of the sheet, whereby the sheet may engage the stop means and the sheet registering devices successively.

39. In a machine of the class described, means for moving a sheet in the direction of a center line thereof, relatively movable sheet registering means and sheet stop means, said sheet registering means being spaced apart for engagement by the sheet at points on its leading edge spaced from and located at opposite sides of said line, and said stop means extending across the machine exteriorly of the spaced sheet registering means and being adapted for contact by the sheet along the portion of said edge extending between said points, and means for moving the stop means and the sheet registering means relatively so that said sheet may engage said stop means before engaging said registering means.

40. In a machine of the class described, means for moving a sheet in the direction of a center line thereof, a pair of stationary sheet registering devices to which the sheet is moved by the sheet registering and spaced apart transversely of the machine for contact by the leading edge of the sheet at points spaced from and located at opposite sides of said line, a movable bar or the like extending across the machine exteriorly of the sheet registering devices and provided along its length with stop means adapted for engagement by the sheet along the portion of said edge between said points, said stop means being movable into and out of the space traversed by said edge portion on movement of the bar in opposite directions, and means for moving said bar and the stop means as aforesaid, whereby the sheet may first engage said stop means and thereafter engage said sheet registering devices.

41. In combination, a bracket, sheet registering means carried thereby, stop means movable in one direction for engagement by a sheet fed towards the sheet registering means and movable in the opposite direction to enable said sheet to engage said sheet registering means, and means on said bracket for moving the sheet up to the sheet registering means upon movement of said stop means in the last named direction.

42. In combination, a bracket, sheet registering means carried thereby, stop means movable in one direction for engagement by a sheet fed toward the sheet registering means and movable in the opposite direction to enable said sheet to engage said sheet registering means, and means on the bracket connected with the stop means and operated thereby to move a sheet up to the sheet registering means when said stop means is moved in the last named direction.

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