H. G. LA SOR.

REGISTERING DEVICE.

APPLICATION FILED MAY 19, 1911. RENEWED MAY 20, 1913.

1,085,345. Patented Jan. 27, 1914.

Fig. 1.

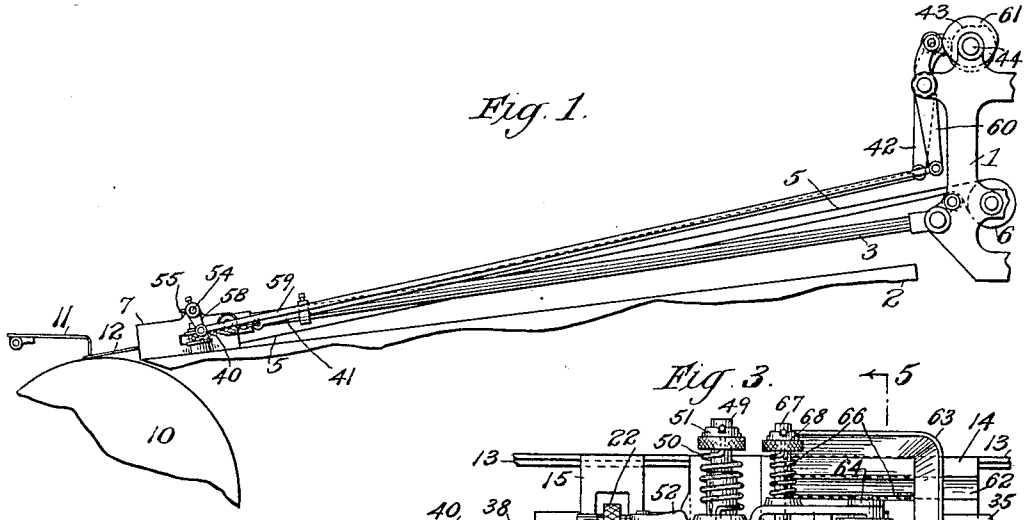


Fig. 3.

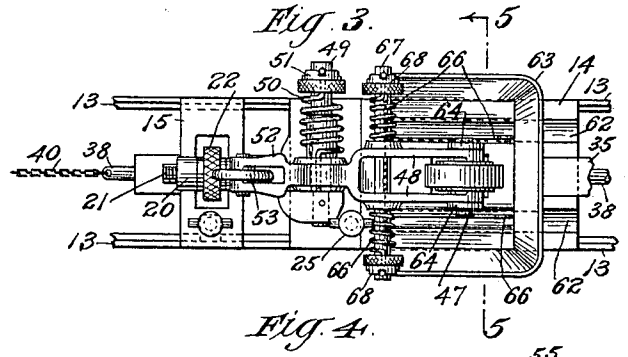


Fig. 2.

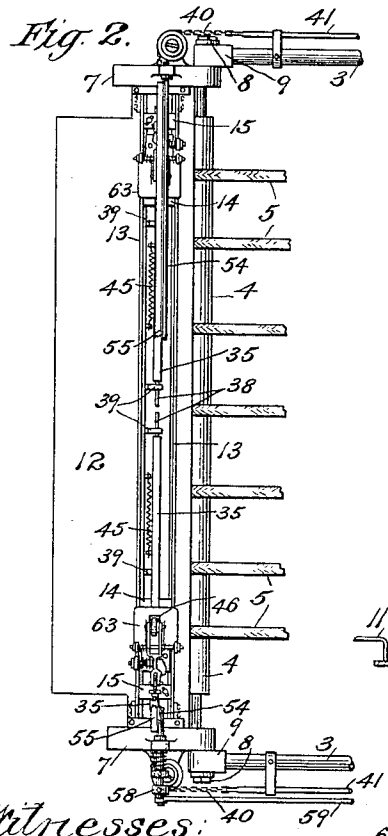


Fig. 4.

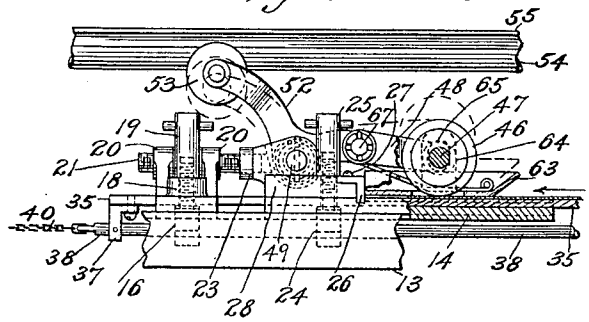


Fig. 5.

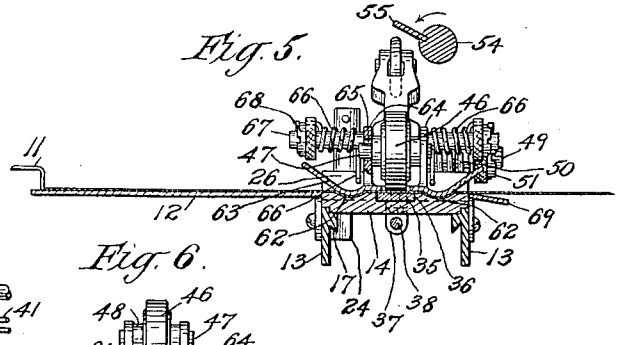
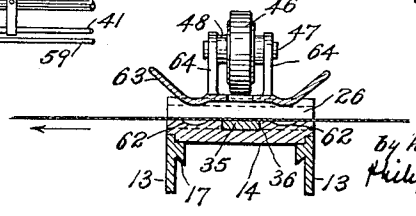


Fig. 6.



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REGISTERING DEVICE.

1,085,345. Specification of Letters Patent. Patented Jan. 27, 1914.

Application filed May 19, 1911, Serial No. 628,295. Renewed May 20, 1913. Serial No. 768,873.

To all whom it may concern:

Be it known that I, HERBERT G. LA SOR, a citizen of the United States, residing at New Haven, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Registering Devices, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in registering devices.

In feeding sheets to printing machines, folding machines and the like, it is necessary to bring the sheet into very accurate position with respect to the agencies which are to subsequently operate upon it, particularly where fine work is desired, and devices of various kinds have been used the purpose of which is to effect an accurate register of the sheets both at the head and at the side. In effecting the register, and particularly in effecting the side register, it is customary to employ gripper mechanisms of various kinds which seize the sheet at the side after it has been registered against the front stops and draw it into proper position. These mechanisms usually employ a guide or an abutment which, as the mechanism is moved forward, strikes the edge of the sheet, after which the clamping devices operate and the sheet is then drawn into its proper position by a movement of the entire gripper mechanism. With this class of devices any slight variation in the width of the sheet is liable to throw out the register, and, further, any wear or looseness in the operating parts will affect the throw of the shifting mechanism, so that the sheet will be improperly positioned. Mechanism of this class is further objectionable on account of the time required for operating it, this objection being particularly marked in high speed feeding machines where a reciprocation or movement in both directions of the side registering mechanism in its entirety is required for each sheet fed.

It is the object of this invention to produce a registering mechanism capable of rapid operation, the operation being unaffected by varying width of sheets, and in which mechanism all liability of improper register due to looseness or inaccuracy in the operating parts is avoided.

With this and other objects not specifically referred to in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

Referring to the accompanying drawings: Figure 1 is a side elevation illustrating diagrammatically the tape carrying frame of an ordinary automatic sheet feed with the improved registering device attached thereto. Fig. 2 is a plan view of the construction shown in Fig. 1. Fig. 3 is an enlarged detail plan view of certain parts of the registering device. Fig. 4 is a side elevation of the construction shown in Fig. 3, this figure also including an operating bar not shown in that figure. Fig. 5 is a section on the line 5—5 of Fig. 3. Fig. 6 is a detail view.

Referring to said drawings, 1 indicates a part of the frame of an ordinary type of automatic sheet feed, and 2 indicates a feed table. The side bars of the tape frame are indicated at 3, these bars carrying a tape roll 4 around which run tapes 5 which also pass over a roll 6 mounted in the frame 1. Extending beyond the ends of the tape frame 3 are blocks or castings 7 pivoted on studs 8 extending through blocks 9 on the ends of the side bars of the tape frame, these blocks or castings forming a part of a frame which rests on the feed-table 2. An ordinary sheet receiving cylinder is indicated at 10 and the usual front stops at 11, these stops bearing on a plate 12 which is carried by the frame formed in part by the castings 7. The construction so far described is the usual one and any other suitable mechanism effecting the same results may be substituted therefor. The castings 7 support cross bars 13 which extend across the machine from side to side.

Constructions embodying the invention in its best form will include a base on which the operating parts of the registering devices are mounted. It may be here remarked that where the invention is embodied in a mechanism for effecting side register, there will usually be two sets of registering devices one on each side of the sheet path, and the construction is so illustrated in Fig. 2, one or the other of said devices being used according as the sheet is registered on one side or the other. As these devices are, however, duplicates only one need be described.

Referring to the particular construction illustrated, the base is marked 14. In the best constructions embodying the invention

this base will be constructed so that it may be adjustably secured in position in order to accommodate varying widths of sheets. This adjustable mounting of the base may be secured in various ways. In the particular construction illustrated, which is designed to effect very fine register, there is provided a positioning block 15 secured to the ways by a bolt 16, see dotted lines in Fig. 4. The head of this bolt is notched to engage a notch 17 (see Fig. 5) formed on the way 13 with which the head coöperates, this bolt passing through a boss 18 formed on the top of the block. A socket nut 19 engages the end of the bolt and serves to draw this head into engagement with the way. The block 15 is provided with ears 20 through which passes a screw 21 provided with a knurled adjusting nut 22 located between the ears. The end of the screw is secured in a socket 23 cast on the base 14. The base 14 carries a bolt 24 (see dotted lines in Fig. 4) coöperating with a socket nut 25, the bolt 24 having a notched head engaging the notch 17 in the way 13, the construction being similar to that of the bolt 16 before described. In positioning the base, the block 15 is placed generally accurately in position, and is then secured in position by the bolt 16 and the socket nut 19. The screw 20 is then operated to accurately determine the position of the base, after which the base is locked in position by screwing down the socket nut 25.

Constructions embodying the invention will include a stop or guide fixed in position during the registering operation and against which the edge of the sheet is registered. In the particular construction illustrated, this stop or guide is marked 26 and is secured by a screw 27 to a block 28 cast in one piece with the base. By making the stop separate and securing it to the block in the manner described it may be made of hardened steel, so as to provide against wear.

Constructions embodying the invention will include means for shifting the sheet to bring its edge against the fixed stop and thus effecting the register, it being understood, of course, that the sheet is brought within the range of action of the sheet shifting means by the forwarding devices which, in the construction illustrated, include the tapes 5. These sheet shifting means may be varied widely in construction. In the best constructions embodying the invention, however, they will be of such a character as to allow a slip between them and the sheet. By constructing the sheet shifting means in this manner, it is possible to give them a movement in excess of the movement required to bring the sheet against the stop, so that although a movement of determined extent is given the sheet shifting means, the register of sheets varying somewhat in width will be effected. This also enables the operating devices for the sheet shifting means to be constructed with less accuracy than would otherwise be necessary.

The particular construction by which the slipping action of the sheet shifting devices is obtained may be varied widely. In the construction selected to illustrate the invention, the sheet shifting devices include a slide 35 movable with respect to the base. As illustrated, this slide works in a way 36 formed in the base. The operating means for the slide, when the shifting devices include this form of construction, may be varied. As shown, the slide 35 is provided with a depending lug 37 pinned to a sliding rod 38 supported at its inner end by a bracket 39 extending from one of the bars 13. This rod runs through one of the blocks 7 and is connected by a chain 40 to a sliding rod 41 in turn connected at its upper end to a cam lever 42 operated by a cam 43 supported on a shaft 44 which extends across the machine and is operated from any moving part. The connections described operate to move the rod in one direction, the return movement being effected by a spring 45 (see Fig. 2).

When a slide is employed as a part of the shifting means, there will be provided, in the best constructions embodying the invention, some means for holding the sheet frictionally against the slide. In the particular construction illustrated, this holding means comprises a roll 46. This roll is mounted on an axle 47 supported in a yoke 48 which forms a roll support. This yoke is pivoted on a stud 49 supported in a bearing carried by the base (see Figs. 3 and 4). In the particular construction illustrated, this stud is provided with a tension spring 50 controlled by a tension nut 51 of the usual type, this tension spring operating to throw the roll support and roll downward so as to bring the roll in contact with the sheet. This roll support has a rearwardly extending arm 52 in which is mounted a roll 53, the arm and roll affording an operating means by which the roll support may be rocked against the tension of the spring 50. The means for operating the roll may be of any suitable character. In the construction shown, however, there is employed a shaft 54 provided with a rib or blade 55 overlying the roll 53, this shaft 54 being journaled in bearings in the blocks 7. The shaft is provided with an operating arm 58 to which is secured a connecting rod 59 secured at its other end to a cam lever 60 operated from a cam 61 on the shaft 44. This shaft and rib enables the base and the operating parts carried thereby to be shifted in position and the operating mechanism for the roll maintained in operative position to the rib without any adjustment.

In the operation of the mechanism so far described after the sheet has been fed over the base and against the front stop, the roll is allowed to drop and the slide started. As the slide moves the edge of the sheet will be brought into contact with the stop 26 and when it is thus brought into contact with the stop the slide will slip under the sheet for the remainder of its movement.

Constructions embodying the invention will usually include means for stiffening the sheet near the edge to avoid liability of buckling after its edge contacts with the stop. While the stiffening means employed may be varied, in the best constructions they will be arranged to engage the sheet abreast the nip of the roll and shifting slide, so that the further movement of the slide after the edge of the sheet has come into contact with the stop will not tend to buckle the sheet on a line extending each way from the nip. In the best constructions, furthermore, the shifting means will be of such a character that they have a movement independent of the movement of the roll. By constructing the stiffening device in such a way that it has a movement independent of the roll, it is enabled to adjust itself with respect to different thicknesses of paper, and, further, such constructions lend themselves readily to the employment of adjusting devices, so that the pressure of the roll and stiffener may be varied. This is also of advantage where different thicknesses of paper are to be handled. In the particular construction shown, the base is provided with two depressions or concavities 62, and there is provided a sheet stiffener comprising a bending plate 63 of such contour as to enable it to force the sheet into the concavities. While the construction for mounting the sheet stiffener may be varied, in the particular construction illustrated, the plate 63 is provided with a pair of upstanding ears 64 having slots 65 (see dotted lines Fig. 4) which slots take over the ends of the axle 47 which carries the rolls 46. This construction has the advantage of enabling the bending plate to move with the roll and also to have a movement independent of the roll. Where means for adjusting the pressure of the stiffener independently of the roll are employed and the construction described is also employed, the adjusting means may well embody springs. In the construction shown two tension springs 66 are employed which bear on the forward end of the plate 63 and pass around tension bolts 67, the tension of the springs being regulated by the usual tension nuts 68. The tension bolts 67 are secured to the arms 48 of the yoke which carries the roll. By varying the position of the nuts 68 any desired tension within the limits of the construction may be given to the stiffening plate and this may be effected independently of the pressure of the roll 46 on the paper which as before described is effected through the tension spring 50.

The upper bar 13, that is, the bar nearest the cam operating mechanism, may be provided with a sheet guide 69 to guide the forward edge of the sheet accurately over the base. It will be understood that after the sheet is registered the shaft 54 is rocked so as to raise the roll, thus permitting the sheet to be forwarded when taken by the grippers.

While the invention has been described in connection with mechanism for effecting side register, it will be understood that it is not confined to side registering mechanisms. Further, in carrying the invention into effect, changes and variations may be made, as has been indicated, in the construction in which the invention is embodied. The invention claimed, therefore, is not to be confined to the particular construction herein shown and described.

What is claimed is:—

1. In a sheet registering device, the combination with a base, of a stop carried thereby, said stop being fixed in position during the registering operation, sheet forwarding devices, means for adjustably securing the base in position with respect to the sheet path, a shifter slide movable with respect to the base, and a roll for holding the sheet against the slide, the said roll being movable into and out of operative position independently of the movement of the shifter slide.

2. In a sheet registering device, the combination with a base, of a stop carried thereby, said stop being fixed in position during the registering operation, sheet forwarding devices, means for adjustably securing the base in position with respect to the sheet path, a flat shifter slide movable with respect to the base, a flat roll for holding the sheet against the slide, and means for bending the edge of the sheet at points lateral to the said slide and roll to stiffen the sheet.

3. In a sheet registering device, the combination with a base, of a sheet shifting slide movable with respect thereto, a stop carried by the base said stop being fixed in position during the registering operation, a movable roll support mounted on the base, and a roll carried by the support and cooperating with the slide, the said roll support having a movement independently of the movement of the said slide.

4. In a sheet registering device, the combination with a base, of a sheet stop carried thereby, said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet bending plate carried by the support and constructed to have a movement independent of the movement of

the support, and a sheet shifting slide movable with respect to the base.

5. In a sheet registering device, the combination with a base, of a sheet stop carried thereby, said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet bending plate carried by the support and constructed to have a movement independent of the movement of the support, resilient means located between the said plate and said support, and a sheet shifting slide movable with respect to the base.

6. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet stiffener mounted to have a movement independent of the movement of the roll, and a sheet shifting slide movable with respect to the base and coöperating with the roll.

7. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet stiffener constructed to have a movement independent of the movement of the support, means for regulating the pressure of the roll and stiffener independently of each other, and a sheet shifting slide movable with respect to the base and coöperating with the roll.

8. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, and a sheet stiffener engaging the sheet abreast the nip of the roll.

9. In a sheet registering device, the combination with a base, of a sheet stop carried thereby, said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, a sheet stiffener engaging the sheet abreast the nip of the roll, and means for adjusting the pressure of the roll and stiffener independently of each other.

10. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, and a sheet stiffener carried by the support and arranged to engage the sheet abreast the nip of the roll and slide.

11. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, and a sheet stiffener carried by the support and arranged to engage the sheet on each side of the roll abreast the nip of the roll and slide.

12. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, and a sheet stiffener carried by the support, said stiffener being mounted to have a movement independent of the movement of the support and arranged to engage the sheet on each side of the roll abreast the nip of the roll and slide.

13. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet shifting slide movable with respect to the base and cooperating with the roll, a sheet stiffener carried by the support, said stiffener being mounted to have a movement independent of the movement of the support and arranged to engage the sheet on each side of the roll abreast the nip of the roll and slide, and means for regulating the pressure of the roll and stiffener independently of each other.

14. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet stiffener carried by the support and having a slotted connection therewith, whereby it is capacitated to have a movement independent of the movement of the support, and a sheet shifting slide movable with respect to the base and coöperating with the roll.

15. In a sheet registering device, the combination with a base, of a sheet stop carried thereby said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll mounted therein, a sheet stiffener carried by the support and having a slotted connection therewith, whereby it is capacitated to have a movement independent of the movement of the support, a sheet shifting slide movable with respect to the base and co-

operating with the roll, and means including suitable springs for independently adjusting the pressure of the roll and stiffener.

16. In a sheet registering device, the combination with a base, of a sheet stop carried thereby, said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll having a flat tread mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, and a sheet stiffener arranged to engage the sheet abreast the nip of the roll and slide.

17. In a sheet registering device, the combination with a base, of a sheet stop carried thereby, said stop being fixed in position during the registering operation, a movable roll support carried by the base, a roll having a flat tread mounted therein, a sheet shifting slide movable with respect to the base and coöperating with the roll, a sheet stiffener arranged to engage the sheet abreast the nip of the roll and slide, and means for regulating the pressure of the roll and stiffener independently of each other.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

HERBERT G. LA SOR.

Witnesses:
J. W. DUFFY,
CHAS. H. LAMB.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."