

March 31, 1925.

1,531,883

W. H. SMITH

SHEET REGISTER DEVICE

Original Filed April 14, 1921

2 Sheets-Sheet 1

Fig-1

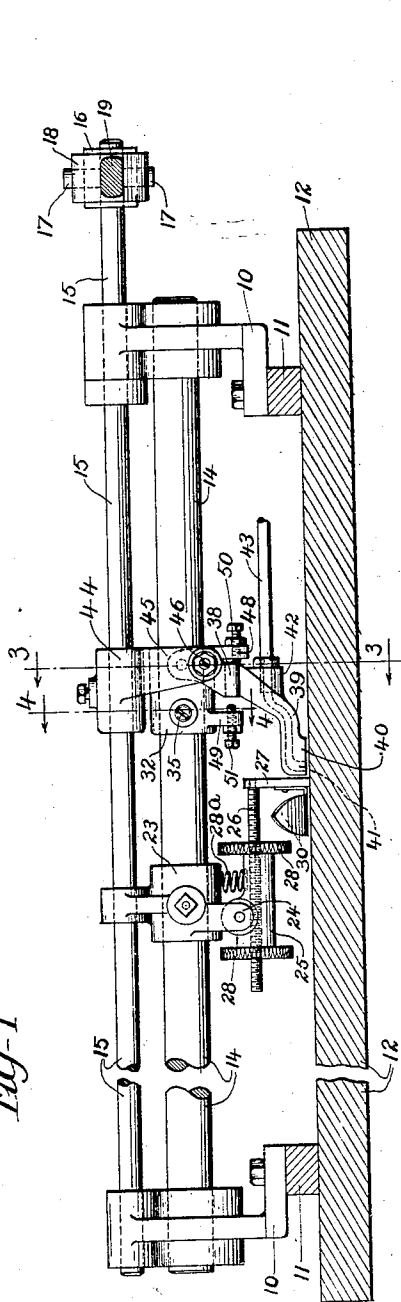
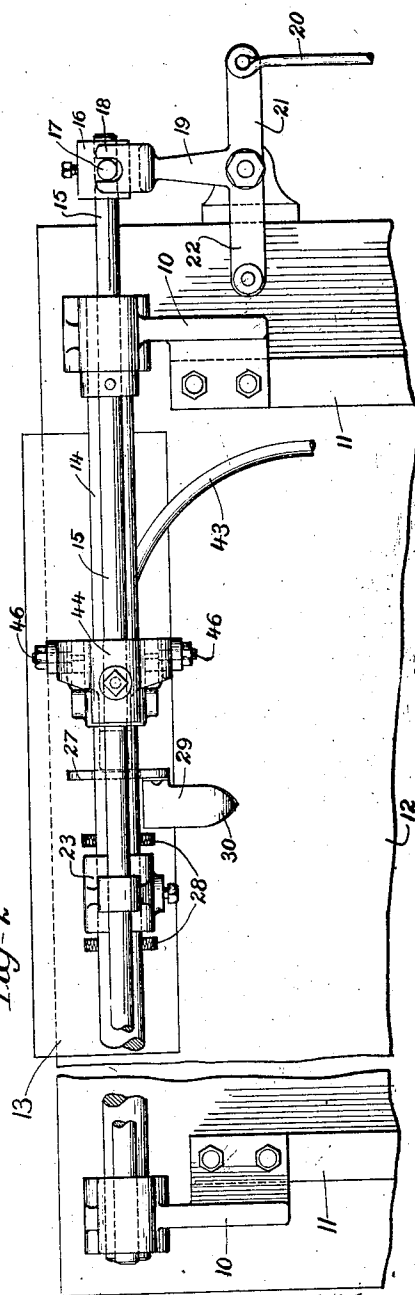


Fig-2



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2 Sheets-Sheet 2

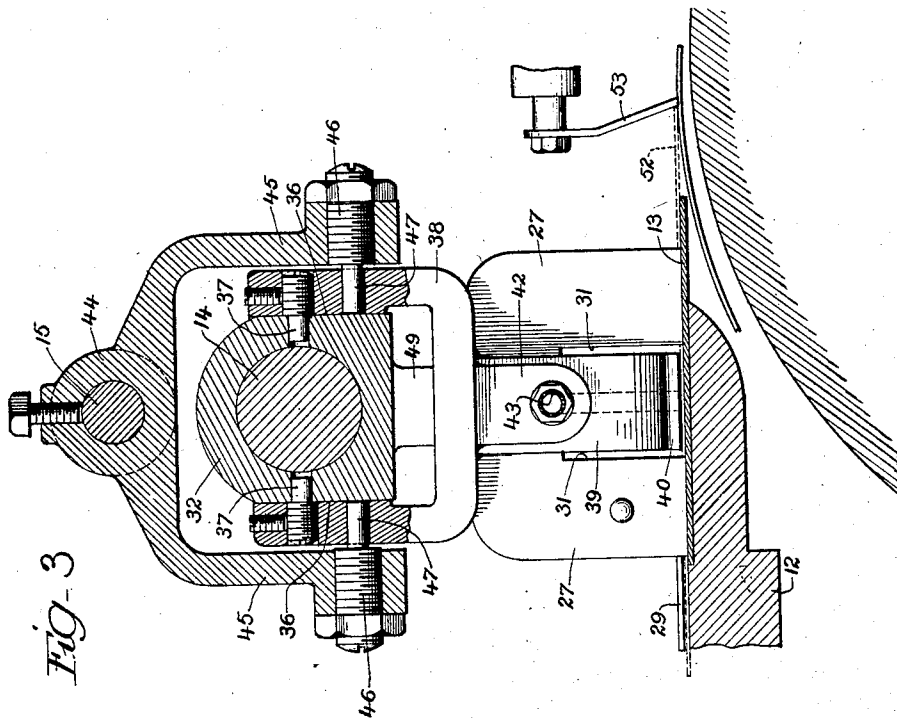


Fig. 3

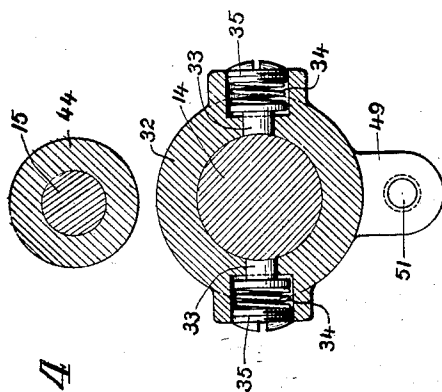
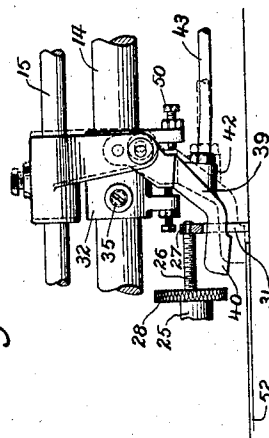


Fig. 4

Fig. 5



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UNITED STATES PATENT OFFICE.

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SHEET-REGISTER DEVICE.

Application filed April 14, 1921, Serial No. 461,307. Renewed August 4, 1924.

To all whom it may concern:

Be it known that I, WALTER H. SMITH, a subject of the King of Great Britain, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Sheet-Register Devices, of which the following is a specification.

My invention relates to sheet registering devices, particularly to devices for registering the sheet sidewise, and especially pertains to devices for bringing sheets into correct side registered position on the feed board of a cylinder printing press.

An important object of my invention lies in the provision of a side registering device the employment of which will not necessitate any cutting into, or other modification of, the feed board of the press. It is another object of my invention to provide a side registering device which will be especially certain in its operation of bringing the sheet accurately into position against a side register gauge. A further object of my invention is to provide a side register device of a character economical to produce and install, simple to understand and easy to adjust and maintain. Other objects will appear from the following specification taken with the claims forming part thereof.

I have shown in the accompanying drawings, and described in the following specification, one form of device in which my invention may be embodied. It is to be understood, however, that the invention may be embodied in other forms, without exceeding the scope thereof, as defined in the appended claims.

In the drawings:

Fig. 1 is a rear elevation of a side registering device, constructed in accordance with my invention, showing the same applied to the feed board of a cylinder press;

Fig. 2 is a plan of the same;

Fig. 3 is an enlarged section, taken on the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a similar section, but taken on the line 4—4 of Fig. 1; and

Fig. 5 is a rear elevation showing the pneumatic registering foot in different positions from that shown in Fig. 1.

The particular form of registering device

herein specifically described is arranged for use in connection with the sheet feeding mechanism disclosed in my copending application Se. No. 460,243 filed April 11, 1921. It includes a pair of bearing brackets 10, 10 secured to rails, 11, 11 such as are disclosed in my said copending application, which rails are secured to a press feed board 12, having, at its front part, a feed plate 13. Secured between the brackets 10 is a rod 14, and slidably mounted in said brackets is a shaft 15. The shaft 15 is provided, at its end, with a removable collar 16 having extending therefrom pins 17 which are embraced by a fork 18 forming part of a double bell-crank lever 19 which is pivotally associated with the feed board. A link 20, connected with one arm, 21, of the bell-crank lever, and given a short reciprocating movement by an appropriate device, such as a cam, crank or the like, effects a rocking movement of the bell-crank lever 19, and thus a lengthwise sliding movement of the shaft 15 in its bearings in the brackets 10. The link 20 may be connected to the other arm, 22, of the double bell-crank lever 19, if desired, so as to reverse the direction of sliding movement of the shaft 15.

Secured to the rod 14, and having a slide bearing for the shaft 15, is a collar 23 having extending downwardly therefrom a pair of lugs 24 between which is pivoted a sleeve 25. A threaded stem 26 passes through the sleeve 25 and carries, at its end, a side-gauge plate 27, a spring 28^a being disposed between the collar 23 and the sleeve 25, so as to cause the bottom of the side-gauge 27 to press firmly on the feed plate 13, thus providing a sure abutment for the edge of the sheet and admitting no possibility of the sheet entering beneath the gauge. Thumb nuts 28 on the stem 26, and engaging against each end of the sleeve 25, permit of a fine adjustment of the position of the side-gauge 27. Coarse adjustment is made by loosening the set screw which secures the collar 23 in position, and sliding the collar to the desired position on the rod 14. The side-gauge 27 has secured thereto a horizontal plate 29, having an upwardly curved rear end 30, which plate insures that the sheet being fed forward shall remain close to the feed-plate, and not curl away

therefrom at the part near the side-gauge. The side-gauge 27 is, further, formed with a slot 31 through which can pass the pneumatic registering foot to be described below.

Mounted on the rod 14 is a collar 32 provided with friction pins 33 (Fig. 4), formed of fibre or the like, which are pressed against the rod 14 by springs 34, the pressure of which can be adjusted by means of screws 35. Thus the collar 32 can slide on the rod 14 if pressure is applied, but will normally be held against such sliding by the friction pins 33. At its end remote from the pins 33, the collar 32 is formed with vertical flat sides 36, and has pivoted thereto, by means of pins 37, the yoke 38 of the pneumatic registering foot. From the yoke 38 extends downwardly and laterally a leg 39 terminating in a foot 40, having in its underside, close to the end, a suction orifice 41 which connects, through a suitable channel with a boss 42 on which is mounted a hose 43 leading to a suitable source of vacuum. Secured to the slide shaft 15 so as to be adjustable thereon, is a saddle 44 having downward extensions 45 which embrace the yoke 38 between them. Studs 46 are threaded into the extensions 45 and are provided at their ends with reduced portions 47 which enter corresponding openings formed in the yoke 38. By adjusting the studs 46, the reduced portions 47 can be caused to make close sliding engagement, with their ends, against the sides of the collar 32, whereby the parts of the group are maintained in proper alignment. Extending downward from the collar 32 are a pair of lugs 48 and 49 carrying adjustable abutment screws 50 and 51, between the ends of which the yoke 38 of the pneumatic registering foot is located, space being left between the ends of these screws, however, so as to permit movement of the yoke between them.

The operation of the device is as follows: By shifting the collar 23 on the rod 14, and afterwards by means of the thumb nuts 28, the side gauge 27 is placed in the position to which it is desired that the sheet be side-registered. The set screw of the saddle 44 being loosened, the saddle and the collar 32 are slid on their respective members until they reach such a position that the end of the foot 40 will just clear the sheet-engaging face of the side gauge 27 when the yoke 38 is engaging against the abutment screw 50, the bell-crank lever 19 being in the position shown in Fig. 2. In practice, the set screw being loosened, the saddle 44 is manually pushed to the left until the foot 40 has passed completely through the slot 31, and is then pulled back to the right until the end of the foot 40 just clears the outside of the side gauge 27 (Fig. 1).

The parts will then be in their correct position, and the set screw is tightened. Prior to an operative movement, the parts, therefore, occupy a position such as is shown in Figs. 1 and 2. The beginning of the registering movement is caused by the link 20 pushing on the arm 21 of the bell-crank lever, thereby causing the shaft 15 to move longitudinally towards the left. The collar 32 being held by the friction pin 33 against movement on the rod 14, the first effect of the sliding movement of the shaft 15 will be the swinging upwardly of the register foot, the pins 47 causing the yoke 38 to rock on its pivots 37 until the yoke engages the front abutment screw 51. Upon the yoke engaging the front abutment screw 51, it can rock no further, and continued sliding movement of the shaft 15 to the left causes the collar 32 to slide upon the rod 14, the pressure of the yoke 38 upon the abutment screw 51 overcoming the resistance offered by the friction pins 33. The movement of the shaft 15 to the left continues until the parts have reached a position such as that shown in full lines in Fig. 5, the foot 40 having passed through the slot 31 of the side-gauge 27 and being in position above a sheet 52 which, by that time, will have arrived in position beneath the plate 29 with its front part projecting over the feed plate 13 and its front edge engaging against the front gauges 53 of the press. Upon the return of the shaft 15 towards the right, effected by a pull being imparted to the link 20, the first effect will be a swinging down of the registering foot into the position shown in dotted lines in Fig. 5, in which it engages upon the sheet 52 and its yoke 38 engages against the abutment screw 50. The continued return movement of the shaft 15 will cause the collar 32 to slide on the rod 14 back to its original position, the pressure of the yoke 38 on the abutment screw 50 overcoming the resistance of the friction pins 33, the parts thus returning to the original position shown in Figs. 1 and 2. During the return movement of the register foot from the position shown in dotted lines in Fig. 5 to the position shown in Fig. 1, suction being applied thereto through the orifice 41, the sheet 52 will be attached to the foot 40 and move therewith until its edge strikes against the side gauge 27, by which gauge it is stopped from further movement, the foot thereafter simply sliding over the sheet until free therefrom. The sheet is thus brought into a proper registered position against the side-gauge 27. An advantage of my improved register device lies in the fact that it is self-contained and entirely independent of the press feed-board, necessitating no mountings thereon nor any cutting or other modification thereof. The certainty and accuracy with which

the device operates is another substantial advantage, as also is the fact that the parts are simple and relatively few, and the fact that the whole device is economical of manufacture and easy of adjustment and maintenance, even by a relatively unskilled operator. As described above, the device registers towards the right-hand side of the press. It is often desirable to register the sheets towards the left-hand side of the press, and, to allow of this, a second set of members, duplicate to those above described, may be provided at the other ends of the rod 14 and shaft 15, or those parts which are shown may be taken off the rod 14 and shaft 15 and reversed as to the direction in which they point. When such duplicate or reversed set is to be used, the direction of movement of the shaft 15 is reversed by connecting the link 20 to the bell crank arm 22 instead of to the bell crank arm 21. It will be noted that all of the elements are made uniform from a common center so as to permit of the above described reversal or duplication for left and right hand register.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. Means for side-registering a sheet on a feed-board, comprising a suction member, means for mounting said suction member above the feed-board, and means for moving said suction member forward towards the sheet, downward to engage the sheet, and rearward to register the sheet.

2. Means for side-registering a sheet on a feed-board, comprising a register gauge co-operating with the feed-board, means above said feed-board for supporting said gauge, a suction member cooperating with said gauge, means for mounting said suction member above the feed board, and means for moving said suction member forward towards the sheet, downward to engage the sheet and rearward to register the sheet against said gauge.

3. Means for side-registering a sheet on a feed-board, comprising a suction member, means for mounting said suction member above the feed-board, and means for moving said suction member upward, then forward towards the sheet, then downward to engage the sheet and then rearward to register the sheet.

4. Means for side-registering a sheet on a feed-board, comprising a register gauge co-operating with the feed-board, means above the feed-board for supporting said gauge, a suction member, means for mounting said suction member above the feed-board, and means for moving said suction member upward, then forward towards the sheet, then downward to engage the sheet, and then rearward to register the sheet against said gauge.

5. Means for side-registering a sheet on a feed-board, comprising a register gauge co-operating with the feed-board and including a gauge plate having an opening formed therethrough, means above said feed-board for supporting said gauge, a suction member for passage through the opening of said gauge plate, means for mounting said suction member above the feed-board, and means for moving said suction member upward, then forward through said opening, then downward to engage the sheet, and then rearward to register the sheet.

6. In a sheet registering device for use on a feed-board, a register gauge including a register plate having an opening formed therethrough, means above said feed-board for supporting said gauge, means for pressing said register plate against the feed-board, and a registering member for passage through the opening of said gauge plate.

7. In a sheet registering device for use on a feed board, a support disposed above said feed-board, a member pivoted to said support, and a gauge carried by said member and engaging the feed-board.

8. In a sheet registering device for use on a feed-board, a support disposed above said feed-board, a member pivoted to said support, a gauge carried by said member and engaging the feed-board, and means for pressing said gauge against said feed-board.

9. In a sheet registering device for use on a feed-board, a rod disposed above said feed-board, a support adjustable on said rod, a member pivoted to said support, and a gauge carried by said member and engaging the feed-board.

10. In a sheet registering device for use on a feed-board, a rod disposed above said feed-board, a support adjustable on said rod, a member pivoted to said support, a gauge carried by said member and engaging the feed-board, and means for pressing said gauge against said feed-board.

11. In a sheet registering device for use on a feed-board, a support disposed above said feed-board, a member pivoted to said support, a stem adjustably mounted in said member, and a gauge carried by said stem and engaging the feed-board.

12. In a sheet registering device for use on a feed board, a support disposed above said feed board, a member pivoted to said support, a stem adjustably mounted in said member, a gauge carried by said stem and engaging the feed-board, and a spring interposed between said member and said support for pressing the gauge against the feed board.

13. In a sheet registering device for use on a feed board, a rod disposed above said feed board, a support adjustable on said rod, a member pivoted to said support, a stem adjustably mounted in said member,

and a gauge carried by said stem and engaging the feed board.

14. In a sheet registering device for use on a feed board, a rod disposed above said feed board, a support adjustable on said rod, a member pivoted to said support, a stem adjustably mounted in said member, a gauge carried by said stem and engaging the feed board, and a spring interposed between said member and said support for pressing the gauge against the feed board.

15. A sheet registering device for use on a feed-board, comprising a support mounted above the feed-board, a member slidable on said support and having an abutment, a suction member pivoted to said first-named member, and means, operating on said suction member independently of said first-named member, for moving said suction member, whereby said suction member moves independently of said first-named member except when engaging said abutment.

16. A sheet registering device for use on a feed-board, comprising a support mounted above the feed board, a member slidable on said support and having a pair of abutments, a suction member pivoted to said first-named member and disposed between said abutments, and means, operating on said suction member independently of said first-named member, for moving said suction member whereby said suction member moves independently of said first-named member except when engaging one or the other of said abutments.

17. A sheet registering device for use on a feed-board, comprising a support mounted above the feed-board, a member slidable on said support and having an abutment, friction means for normally maintaining said member against sliding, a suction member pivoted to said first-named member, and means, operating on said suction member independently of said first-named member, for moving said suction member, whereby said suction member moves independently of said first-named member except when engaging said abutment.

18. A sheet registering device for use on a feed-board, comprising a support mounted above the feed-board, a member slidable on said support and having a pair of abutments, friction means for normally maintaining said member against sliding, a suction member pivoted to said first-named member and disposed between said abutments, and means, operating on said suction member independently of said first-named member, for moving said suction member, whereby said suction member moves independently of said first-named member except when engaging one or the other of said abutments.

19. A sheet registering device for use on

a feed-board, comprising a support, a member slidable on said support and having an abutment, a suction member pivoted to said first-named member, and cooperating with said abutment, a reciprocable shaft, an element carried by said shaft and engaging said suction member, and means for reciprocating said shaft whereby said element moves said suction member independently of said first-named member except when said suction member engages said abutment.

20. A sheet registering device for use on a feed-board, comprising a support, a member slidable on said support and having a pair of abutments, a suction member pivoted to said first-named member and disposed between said abutments, a reciprocable shaft, an element carried by said shaft and engaging said suction member, and means for reciprocating said shaft, whereby said element moves said suction member independently of said first-named member except when said suction member engages one or the other of said abutments.

21. A sheet registering device for use on a feed-board, comprising a rod extending transversely above the feed-board, a reciprocable shaft disposed above said rod, a member slidable on said rod and having an abutment, friction means normally preventing sliding of said member, a suction member pivoted to said first-named member and cooperating with said abutment, an element secured to said shaft and engaging said suction member to move the latter, and means for reciprocating said shaft, whereby said suction member is rocked about its pivot when not engaging said abutment and slides with respect to said rod when engaging said abutment.

22. A sheet registering device for use on a feed-board, comprising a rod extending transversely above the feed-board, a reciprocable shaft disposed above said rod, a member slidable on said rod and having a pair of abutments, friction means normally preventing sliding of said member, a suction member pivoted to said first-named member and disposed between said abutments, an element secured to said shaft and engaging said suction member to move the latter, and means for reciprocating said shaft, whereby said suction member is rocked about its pivot when not engaging one or the other of said abutments and slides with respect to said rod when engaging one of said abutments.

23. A sheet registering device for use on a feed-board, comprising a rod extending transversely above the feed-board, a gauge pivotally associated with said rod and engaging the feed-board, a reciprocable shaft disposed above said rod, a member slidable on said rod and having a pair of abutments, friction means normally preventing sliding

of said member, a suction member cooperating with said gauge and pivoted to said first-named member between said abutments, an element secured to said shaft and
5 engaging said suction member to move the latter, and means for reciprocating said shaft, whereby said suction member is rocked about its pivot when not engaging
one or the other of said abutments and slides with respect to said rod when engaging one of said abutments. 10

WALTER H. SMITH.

Witnesses:

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