April 1, 1924. 1,489,045

B. D. STEVENS

PRINTING PRESS SHEET REGISTRATION FEED BOARD

Filed Feb. 26, 1921

Fig. 1.

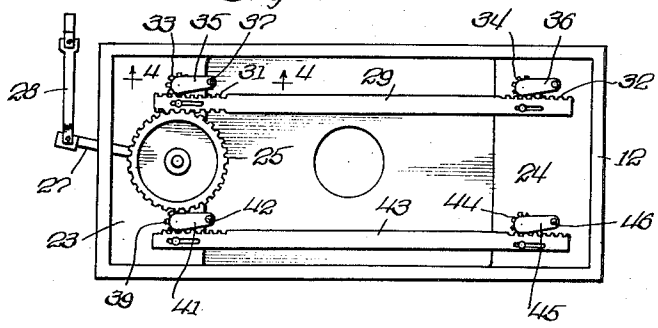


Fig. 2.

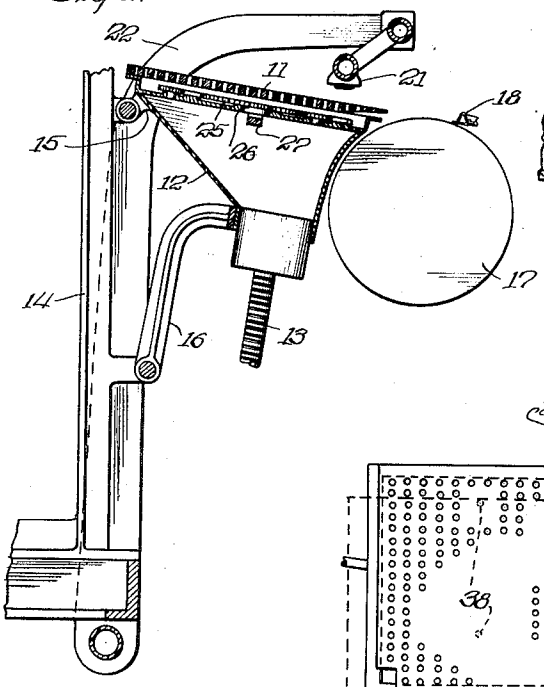


Fig. 4.

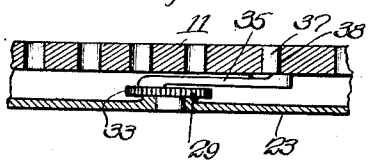
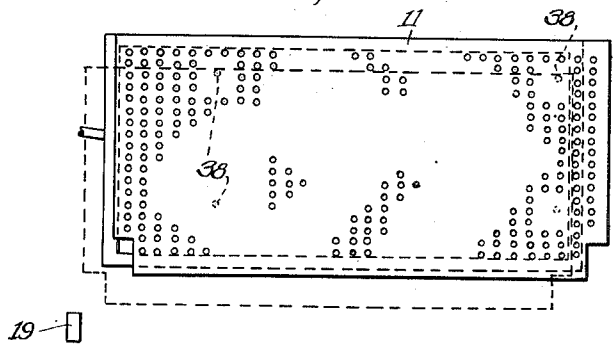


Fig. 3.



Witness:
H. C. Coleman

Inventor:
Burt D. Stevens
By Walter M. Fuller
Atty.

Patented Apr. 1, 1924. 1,489,045

UNITED STATES PATENT OFFICE.

BURT D. STEVENS, OF EVANSTON, ILLINOIS, ASSIGNOR TO MIEHLE PRINTING PRESS AND MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRINTING-PRESS SHEET-REGISTRATION FEED BOARD.

Application filed February 26, 1921. Serial No. 448,114.

To all whom it may concern:

Be it known that I, BURT D. STEVENS, a citizen of the United States, residing at Evanston, in the county of Cook, and State of Illinois, have invented certain new and useful Improvements in Printing-Press Sheet-Registration Feed Boards, of which the following is a specification.

My present invention pertains to new features or principles of construction with resulting novel modes of functioning in the sheet-registration boards used in printing-presses and similar appliances for carrying or moving paper sheets in succession against suitable guides or gauges, such as the customary front and side guides of a printing-press, whereby the sheets in turn are brought into proper position for gripping to the impression-cylinder.

One outstanding characteristic of such improved structure resides in the employment of a constant slight suction imposed through perforations or apertures in such registration-board on the sheet resting thereon, which suction or air-exhausting action is sufficient to retain the sheet on the board and maintain it against unintentional displacement, but nevertheless permits the sheet to be moved relatively to the board, whereby, after the sheet, during the registration movement of the board, engages the guides, it will remain in register with them although the travel of the board tends to carry it somewhat further.

Thus the sheet is held to the board under sufficient atmospheric pressure to eliminate the possibility of its undesigned or accidental dislodgement or disarrangement yet enabling it to be moved relatively to the board by contact the guides or gauges during the travel of the board to obtain the proper or correct registration.

Another feature of the invention resides in improved means for actuating or moving the registration-board in a general diagonal or oblique line to the sheet guides.

In the associated drawing I have illustrated a convenient embodiment of the invention in order that those skilled in this industry may understand its structural characteristics and its several benefits and advantages, but it is to be remembered that the invention is capable of embodiment in many different forms all possessing in more or less degree the gains incident to and characteristic of the invention.

In this drawing the same numerals of reference have been used to designate like parts or elements throughout the several views.

In such drawing:

Figure 1 is a plan view of the mechanism for operating the apertured feed or registration board;

Figure 2 is a vertical section showing in addition the registration board, the suction appliance, the sheet carrier, and the impression-cylinder;

Figure 3 is a plan view of the structure with parts omitted; and

Figure 4 is an enlarged, vertical, fragmentary section on line 4—4 of Figure 1 illustrating one of the driving connections with the feed or registration board.

It will be perceived from the drawing that an inclined perforated or apertured feed or registration-board 11 is mounted to slide on the top face of a hollow tapered body or shell 12 on which the suction or air exhaustion is exerted through a pipe 13 by a vacuum-pump, not shown.

Such members are desirably and conveniently mounted on the framework 14 of the machine by brackets 15 and 16 or by means of any other appropriate supports.

The registration or feed board is located adjacent or in juxtaposition to the impression-cylinder 17 of the printing-press, shown largely diagrammatically, to one or more suitably mounted front guides or gauges 18, and to a side guide or gauge 19, with all of which elements the board cooperates.

The paper sheets are removed individually in sequence from a pile or stack, not illustrated, by a suction or other appropriate sheet feeder or carrier 21 mounted on curved or bent rock-arms 22 and deposited one by one on the registration-board, by cutting off the sustaining suction on the feeder at the proper moment in suitable timed relation to the actuation of the other parts of the press.

The operating means for such registration-board comprises the following interrelated and coacting instrumentalities.

The casing or shell 12 has two webs or ledges 23 and 24 at its opposite ends, on the former of which a gear 25 is mounted for oscillation in a bearing 26, being rocked or

turned back and forth by an arm 27 secured to the gear and actuated by a power-operated link 28 connected to any appropriate source of power.

In mesh with the teeth of such gear is a suitably guided reciprocatory rack 29 having other sets or rows of teeth 31 and 32 constituting supplemental or auxiliary racks at its opposite ends meshing with those of two small gears 33 and 34 revolubly mounted in the two webs and each equipped with an arm 35 and 36, respectively.

At its free end each of such arms has an upstanding pin 37 fitting in a bearing 38 of the registration-board, thereby providing a pivotal connection between the arm and board.

Opposite the rack 29 the gear 25 is in mesh with a small gear 39 likewise equipped with an arm 41 supplied with a pin 42 having a pivotal or rocking engagement with the board.

This gear is additionally in mesh with the teeth of a sliding rack bar 43, teeth on the other end of which oscillate a gear 44 rockingly mounted in the web or ledge 24 and provided with an arm 45 and a pin 46 connected to the registration-board pivotally like the other arm.

It will be readily perceived that the four arms 35, 36, 41 and 45 constitute a parallel-motion operating mechanism for the registration or feed platform or board, and that the travel of the latter is first somewhat downwards to carry the sheet against the front guides and then more sidewise to shift the sheet into contact with the side gauge or guide.

The movement of the board may be more or less aptly characterized as oblique, but in moving laterally it also continues in some degree to travel forwardly, whereby the front edge of the sheet is maintained against the front guides while registration with the side guide is being effected.

The degree of suction exerted on the sheet is relatively small so that the sheet having once come in contact with either or both guides maintains such engagement and registration therewith, sliding or shifting its position on the board during the further or continued movement of the latter.

The steady or practically unvarying constant suction exerted on the sheet prevents its displacement on the board, but the air exhaustion is insufficient to prevent its ready shifting of position on the board after it has engaged the guide or guides.

At the proper moment the registered sheet is gripped to the cylinder in the usual way and printed in the customary manner.

Thus the reception of the sheet by the board, its registration with the guides, and its removal from the board, all occur while suction is applied to the latter, such slight air-exhausting-action being continuous or uninterrupted.

Those skilled in this art will readily understand that the invention is not limited and restricted to the precise and exact details of construction presented because these may be varied within comparatively wide limits without departure from the heart, essence and substance of the invention.

I claim:

1. In a sheet-registration mechanism of the character described, the combination of a registration-board, means to actuate said board, means to constantly apply suction to said board adapted to hold a sheet thereon, means to deliver the sheets to said board, and means to remove the registered sheets therefrom, substantially as described.

2. In a sheet-registration mechanism of the character described, the combination of a registration-board, means to actuate said board, means to constantly apply a substantially-unvarying suction to said board adapted to hold a sheet thereon, means to deliver the sheets to said board, and means to remove the registered sheets therefrom, substantially as described.

3. In a sheet-registration mechanism of the character described, the combination of a perforated registration-board, means to constantly apply suction to the board through its perforations to hold a sheet thereon, a sheet-guide, means to move said board to carry the sheet adhered thereto by suction against and into registration with said guide, the degree of suction permitting shifting of the sheet relative to the board during continued movement of the latter after the sheet engages the guide, means to deliver the sheets to said board, and means to remove the registered sheets therefrom, substantially as described.

4. In a sheet-registration mechanism of the character described, the combination of a perforated registration-board, means to constantly apply suction to the board through its perforations to hold a sheet thereon, a plurality of sheet-guides arranged at an angle to one another, and means to move said board to carry the sheet adhered thereto by suction against and into register with said guides, the degree of suction permitting shifting of the sheet relative to the board during continued movement of the latter after the sheet engages the guides, substantially as described.

5. In a sheet-registration mechanism of the character described, the combination of a perforated registration-board, means to constantly apply suction to the board through its perforations to hold a sheet thereon, a front guide, a side guide, and means to move said board in a general diagonal direction with respect to said guides to carry the sheet adhered thereto by suc-

tion against and into register with both of said guides, the degree of suction permitting shifting of the sheet on the board during continued movement of the latter after the sheet engages the guides, substantially as described.

6. In a sheet-registration mechanism of the character described, the combination of a perforated registration-board, means to constantly apply suction to the board through its perforations to hold a sheet thereon, front and side guides, and means to move said board to carry the sheet adhered thereto by suction against and into register with one of said guides and then against and into registration with the other guide without ceasing its movement toward the first guide, the degree of suction permitting shifting of the sheet on the board during continued movement of the latter after the sheet engages the guides, substantially as described.

7. In an appliance of the character described, the combination of a movable sheet-registration board, and means to actuate said board comprising a plurality of oscillatory arms each having a pivotal connection with said board, a gear rigid with each arm, a plurality of racks to actuate said gears, a main driving gear to slide said racks, and means to oscillate said main gear, substantially as described.

8. In an appliance of the character described, the combination of a movable sheet-registration board, and means to actuate said board comprising two pairs of oscillatory arms each having a pivotal connection with said board, a gear rigid with each of said arms, a rack meshing with the gears of one pair of said arms, a second rack meshing with the gears of the other pair of said arms, a driving gear in mesh with one of said racks and the gear of one of said arms of the other pair, and means to oscillate said gear, substantially as described.

9. In a sheet-registration mechanism of the character described, the combination of a registration-board, means to actuate said board, means to constantly apply suction to said board adapted to hold a sheet thereon, and means to feed the sheets with relation to said registration-board, substantially as described.

BURT D. STEVENS.