H. HALLSTREAM.

REGISTERING MECHANISM FOR SHEET FEEDERS.

APPLICATION FILED DEC. 27, 1915.

1,206,218.

Patented Nov. 28, 1916.

2 SHEETS—SHEET 1.

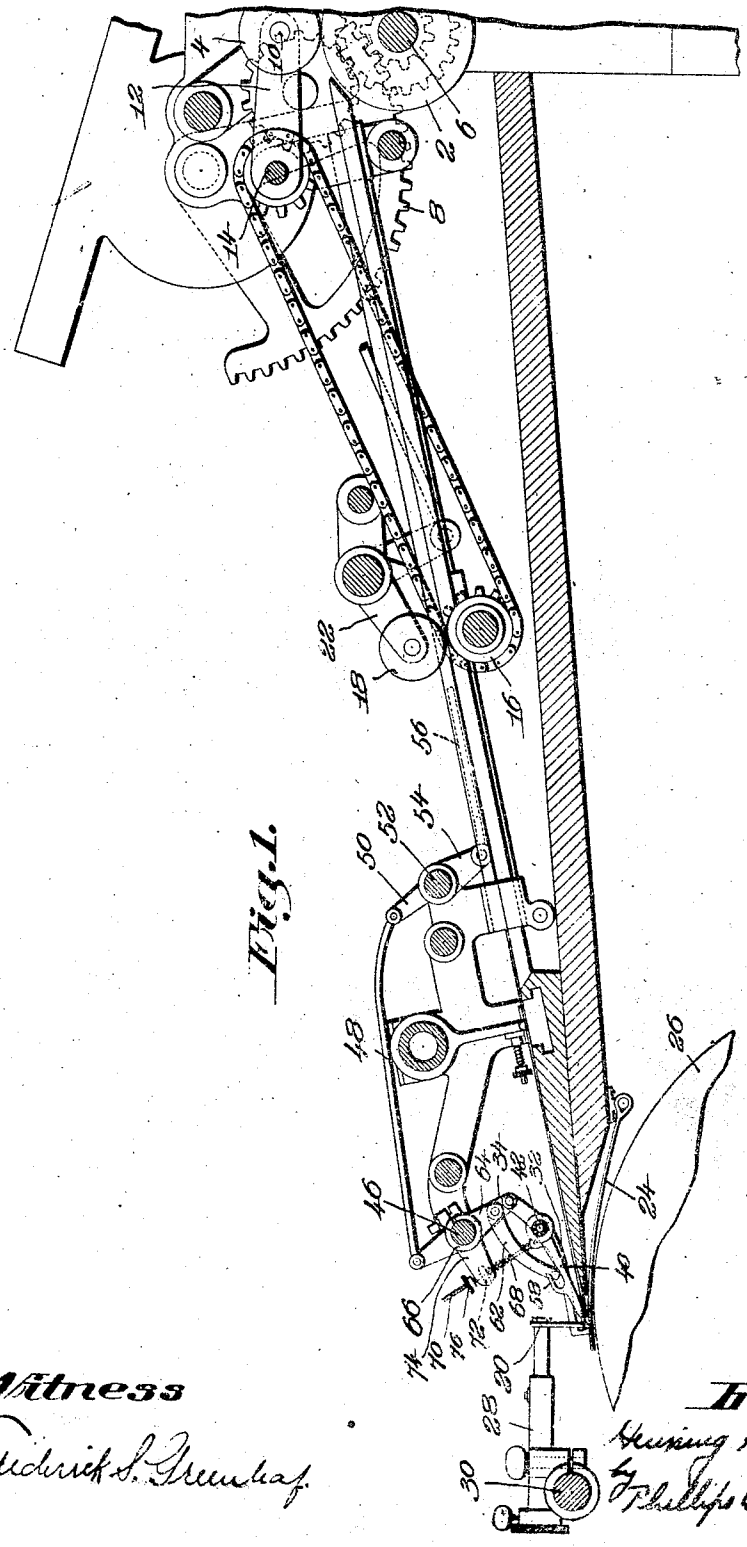


Fig. 1.

Witness

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2 SHEETS—SHEET 2.

Fig. 2.

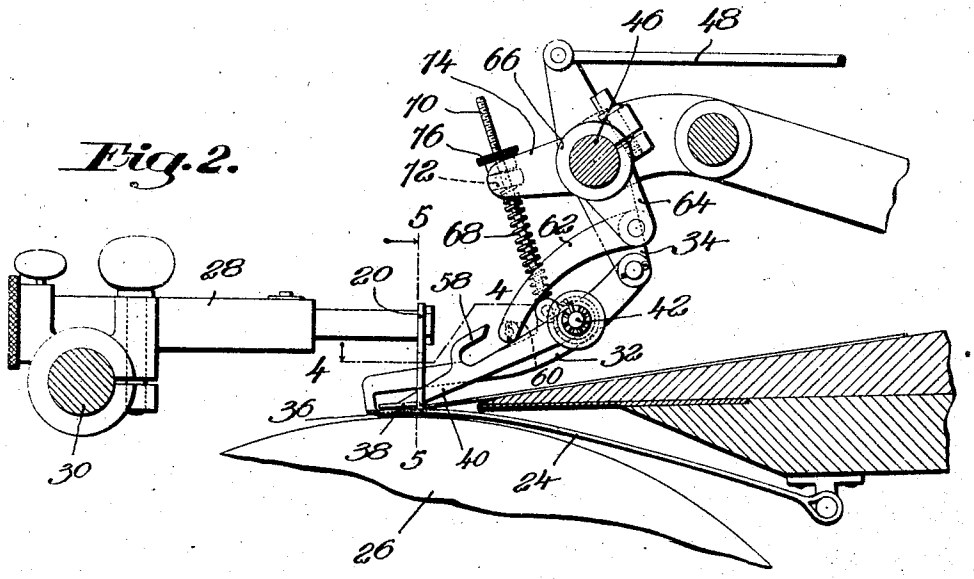


Fig. 3.

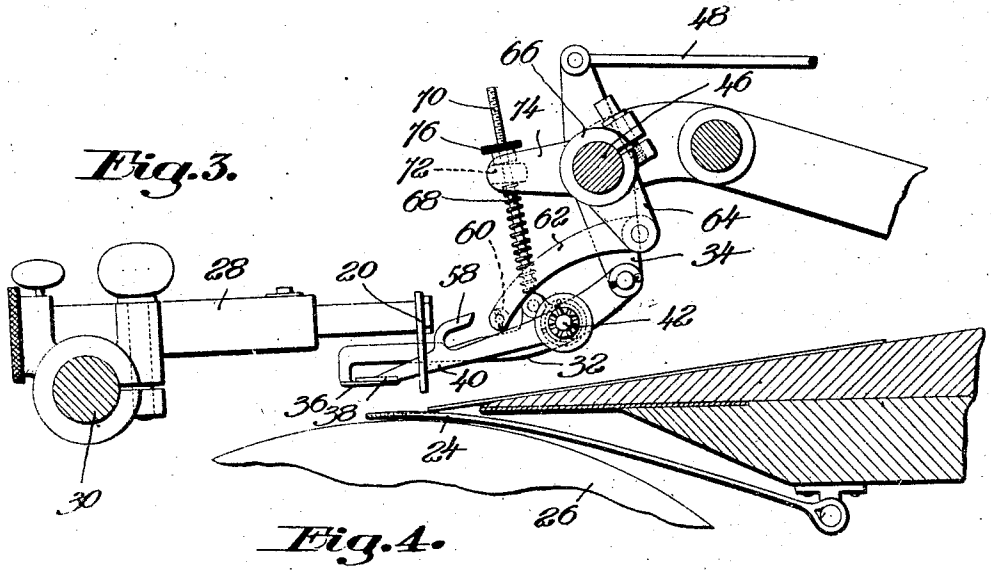


Fig. 4.

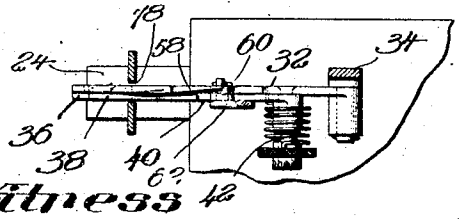
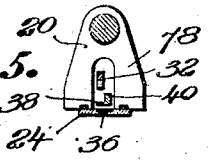


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENNING HALLSTREAM, OF BROCKTON, MASSACHUSETTS, ASSIGNOR TO CROSS PAPER FEEDER COMPANY, A CORPORATION OF MAINE.

REGISTERING MECHANISM FOR SHEET-FEEDERS.

1,206,218. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed December 27, 1915. Serial No. 68,777.

To all whom it may concern:

Be it known that I, HENNING HALLSTREAM, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Registering Mechanism for Sheet-Feeders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to mechanism for securing the front register of sheets which are automatically fed to the front guides of a printing press or analogous machine.

The object of the invention is to provide a novel and improved construction and arrangement of front registering grippers which act to draw the front edge of the sheet against the front guides, and which are adapted to be moved into and out of position to act upon the sheets independently of the movement of the front guides.

To this end the invention comprises the features of construction and combinations of parts hereinafter described and set forth in the claims.

The invention will be readily understood from an inspection of the accompanying drawings and the following detailed description of the mechanism illustrated therein.

In the drawings, Figure 1 is a longitudinal sectional elevation showing so much of an automatic sheet feeding machine as is necessary to illustrate the application of the present invention thereto; Figs. 2 and 3 are similar views showing the parts directly back of the front guides in different positions; Fig. 4 is a detail sectional plan view on line 4—4, Fig. 2; and Fig. 5 is a detail sectional view on line 5—5, Fig. 2.

In the drawings the invention is shown as embodied in the automatic sheet feeding machine known as the "Cross paper feeder." In this machine a bank of feathered sheets is acted upon by the independently controlled combing wheels which are lowered upon the sheets at regular intervals, and each of which is independently disengaged from the sheets by devices controlled by a trip arranged to be engaged by the front edge of the top sheet when the sheet has been advanced into position to be acted upon by the delivery rolls 2 and 4. The lower delivery rolls are secured to a shaft 6 which is actuated by an oscillating segment 8, and the upper delivery rolls are mounted upon a shaft 10 which is carried by arms 12 secured to a rock shaft 14. The rock shaft is operated to raise and lower the upper delivery rolls at proper intervals, and the operating segment 8 for the lower delivery rolls is so timed that the sheet is started from a state of rest with a gradually accelerated motion. The delivery rolls forward the sheets to forwarding rolls 16 and 18, the lower rolls of which are driven in unison with the lower delivery rolls, and which forward the sheets to the front guides 20 of the printing press to which the sheets are being fed. The forwarding rolls are so driven through their connection with the lower delivery rolls that they act to gradually slow down the sheet and bring it to rest with its front edge a short distance back of the front guides. The upper forwarding rolls 18 are carried in arms 22 which are operated at proper intervals to raise and lower the rolls. As shown, the front guides are similar to the usual drop guides commonly used on printing presses, and coöperate with the usual tongues or strips 24 which project from the front edge of the feed board over the cylinder 26 of the printing press. The front guides are secured to arms 28 carried on a rock shaft 30 which is operated in the usual manner to raise and lower the drop guides. There are two front guides, as usual (one only of which is shown), and the guides and tongues 24 are provided with the usual adjusting devices.

In embodying the present improvements in a machine having the construction and mode of operation above described, two sheet registering grippers, which grip the front edge of the sheet and draw it against the front guides, are supported adjacent to but independently of the front guides, and are independently moved to remove the gripper jaws and the parts carrying them from the path of the sheet during its removal, and for returning the grippers into

position for the entrance of the front edge of the succeeding sheet between the gripper jaws after the sheet has been removed. By supporting and moving the grippers independently of the front guides, the grippers may be readily and conveniently incorporated in machines with little or no change or modification in the front guides and tongues with which the machine may be provided. This construction also enables the front registering grippers to be incorporated in machines which are provided with swinging or oscillating front guides which are ill adapted to support and carry front registering grippers.

In the construction shown, each gripper comprises an arm 32, the rear end of which is pivoted to the lower end of a lever 34, and the front end of which projects downward and carries at its lower end a thin plate 36 which forms the lower jaw of the gripper. The upper jaw 38 is in the form of a thin plate overlying the plate 36, and formed on the front end of a vertically movable arm 40, the rear end of which is pivoted on a stud 42 projecting from the arm 32. A torsional spring surrounds the hub of the arm 40 and tends to force it downward and thus close the jaws of the gripper. One end of the spring is connected to the arm 40, and the other to an adjustable collar mounted on the end of the stud 42, and provided with a series of radial slots adapted to be entered by a pin projecting from the stud. The lever 34 on which the gripper arm 32 is pivotally supported is mounted to turn on a cross-rod 46, and the upper end of the arm is connected by a link 48 with an arm 50 secured to a rock shaft 52. The rock shaft is operated to advance and retract the grippers through an arm 54 secured to one end of the rock shaft 52, and connected by a link 56 with a cam on the cam shaft of the machine. When the grippers are in retracted position, the lower gripper plate or jaw 36 of each gripper lies within a slot formed in the upper surface of the corresponding tongue 24, while the upper plate or jaw 38 is held away from the lower jaw by a finger 58 on the upper side of the arm 40, which at this time overlies a roll 60 carried by the front end of an arm 62, and arranged to rest on the upper edge of the arm 32. The rear end of the arm 62 is pivoted to an arm 64 formed on a collar 66 which is secured to the cross-rod 46. The lower gripper plate or jaw 36 is held firmly against the tongue 24 by a spring 68 surrounding a rod 70, the lower end of which is pivoted to a lug on the upper edge of the arm 32, and the upper end of which passes through a lug 72 on an arm 74 which projects horizontally from the lever 34. The spring 69 is interposed between the lug 72 and the lug on the upper side of the arm 32, and forces the arm downward toward the tongue 24. The upper end of the rod 70 is screw-threaded and carries a thumb nut 76 which overlies the lug 72 for a purpose to be described. The front guides are provided with slots 78 through which the grippers play as they are advanced and retracted.

The grippers are in retracted position, with the lower jaws below and the upper jaws above the path of the sheet, when the sheet is advanced by the forwarding rolls 16 and 18 into position back of the front guides, as indicated in Fig. 1. As the sheet comes into this position the front edge passes freely between the jaws of the grippers. Immediately thereafter the shaft 52 is rocked to advance the grippers. During the first forward movement of the gripper arms 32, the fingers 58 ride off of the rolls 60, so that the upper jaws 38 are closed to grip the front edge of the sheet directly back of each front guide. As the forward movement of the grippers continues, the grippers act to draw the sheet forward until the front edge of the sheet engages the front guides, after which the jaws slide forward over the sheet, maintaining it in position against the front guides. In case the edge of the sheet strikes one front guide before the other, the gripper continues to draw the edge of the sheet against this guide, while the other gripper brings the edge of the sheet against the other guide. The forward movement of the grippers carries the rear edges of the lower plates or jaws 36 beyond the front guides, thus disengaging the jaws from the sheet. The position of the parts as the under jaws of the grippers pass from beneath the front edge of the sheet is indicated in Fig. 2. As the gripper jaws reach this position the swinging movement of the lever 34 brings the lug 72 into engagement with the nut 76, so that the further movement of the lever 34 lifts the arm 32 and the gripper jaws up out of the path of the sheet and into the position indicated in Fig. 3. At substantially the same time the front guides are raised, so that the sheet may be taken away by the grippers on the cylinder 26 in the usual manner. After the sheet has been removed the lever 34 is swung in the opposite direction, thus lowering the gripper arm 32 and retracting it into the position indicated in Fig. 1. As the parts come into this position the fingers 58 ride up on to the rolls 60, thus raising the upper jaws of the grippers, so that the jaws are again in position for the entrance of the front edge of the succeeding sheet.

While it is preferred to employ the specific construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential to the broader features of the invention, and may be varied or modified as

found desirable or best suited to the construction of the machine in which the invention is to be embodied.

Having explained the nature and object of the invention, and specifically described one form of mechanism in which it may be embodied, what is claimed is:—

1. A front registering mechanism for sheet feeders, having, in combination, front guides movable into and out of the path of the sheet, sheet registering grippers each comprising upper and lower jaws arranged adjacent to the front guides and independently supported, means for actuating the grippers to grip the front edge of the sheet, draw it forward against the front guides, and slide over the sheet after the forward movement of the sheet is arrested by the corresponding front guide, and means for removing the grippers from the path of the sheet and for returning them to position with their upper and lower jaws on opposite sides of the path of the sheet.

2. A front registering mechanism for sheet feeders, having, in combination, front guides movable into and out of the path of the sheet, a sheet registering gripper corresponding to each front guide comprising an upper and a lower jaw between which the front edge of the sheet passes, supports for the grippers independent of the front guides, means for actuating the grippers to grip the front edge of the sheet, draw it forward against the front guides and slide over the sheet after the forward movement of the sheet is arrested by the corresponding front guide, and means for raising the grippers during the removal of the sheet and for thereafter returning them to position with their upper and lower jaws on opposite sides of the path of the sheet.

3. A front registering mechanism for sheet feeders, having, in combination, front guides movable into and out of the path of the sheet, a sheet registering gripper corresponding to each front guide comprising a reciprocating arm provided with a fixed lower gripping jaw and a vertically movable upper jaw, supports for the arms independent of the front guides, means for advancing a sheet to bring its front edge between the jaws of the grippers, means for closing the gripper jaws and for advancing the gripper arms to carry the rear edge of the lower jaw beyond the front guides, and means for raising the arms during the removal of the sheet and for returning the grippers to position for the entrance of the succeeding sheet between their jaws.

HENNING HALLSTREAM.