May 15, 1951 T. ROWLANDS 2,553,148

MECHANISM FOR REGISTERING SHEETS BEING FED TO PRINTING MACHINES AND THE LIKE

Filed Dec. 24, 1947 3 Sheets-Sheet 1

Fig. 1.

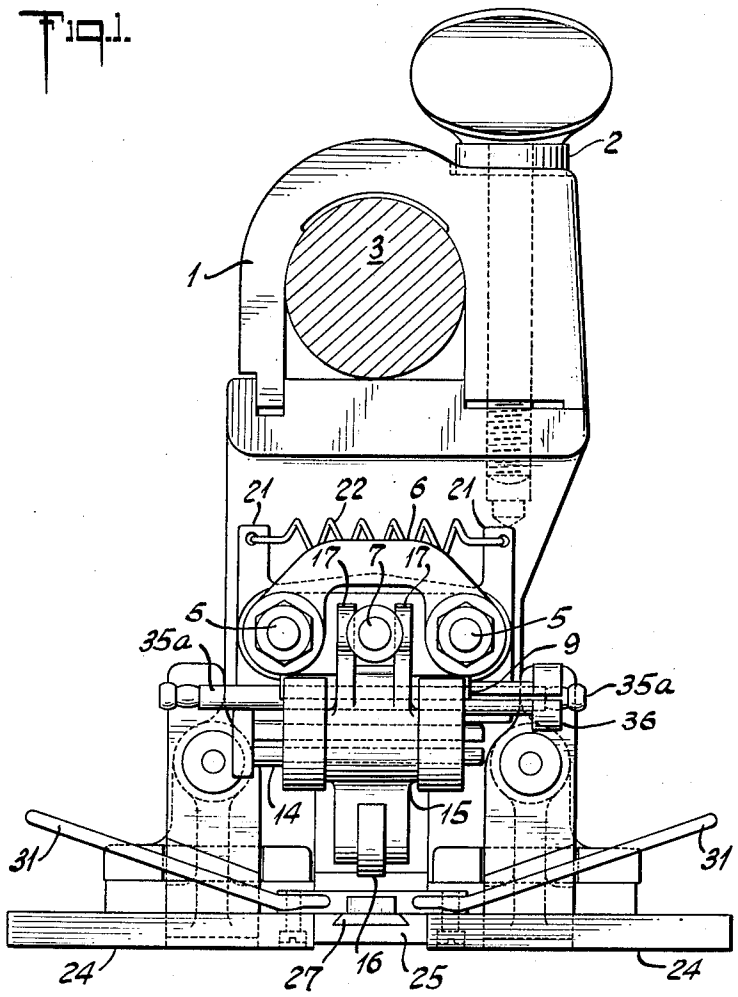
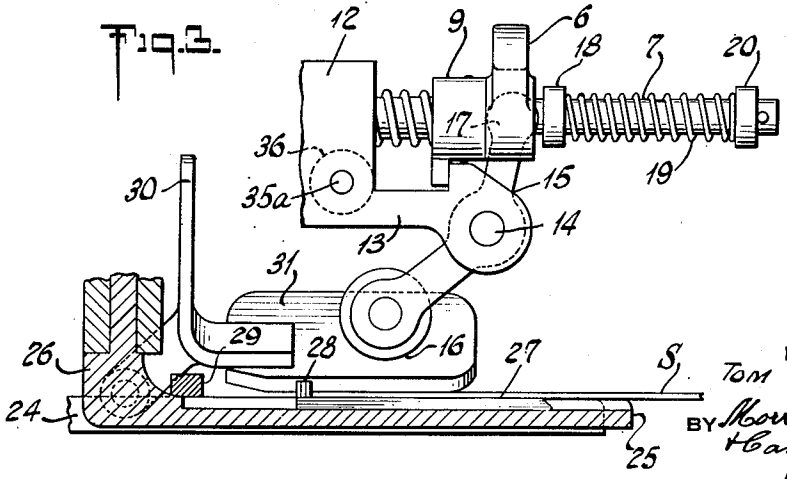


Fig. 3.



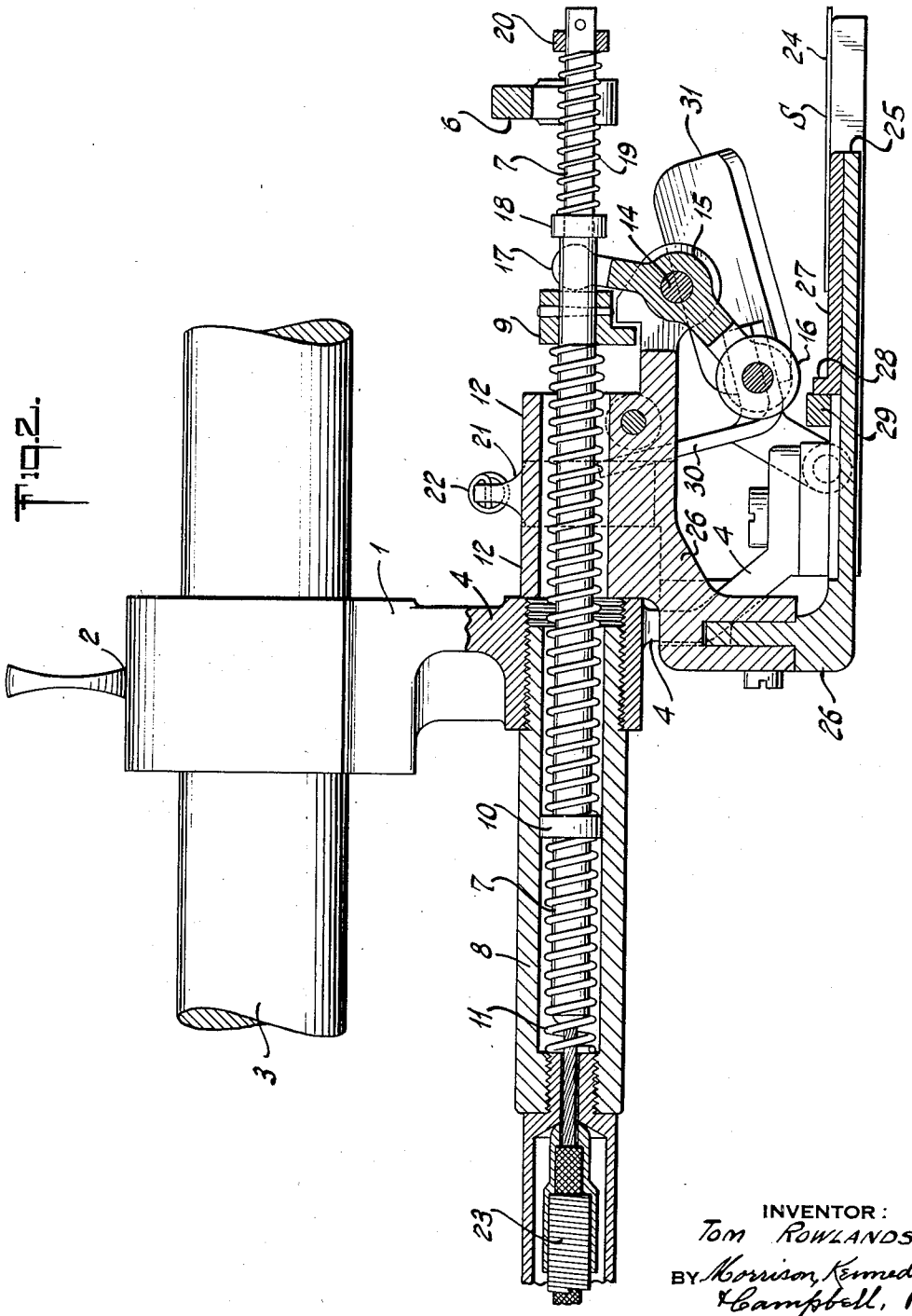
INVENTOR:
TOM ROWLANDS.
BY Morrison, Kennedy & Campbell,
ATTORNEYS:

May 15, 1951 T. ROWLANDS 2,553,148

MECHANISM FOR REGISTERING SHEETS BEING FED TO PRINTING MACHINES AND THE LIKE

Filed Dec. 24, 1947 3 Sheets-Sheet 2

FIG. 2.



INVENTOR:
TOM ROWLANDS.
BY Morrison, Kennedy & Campbell,
ATTORNEYS:

May 15, 1951 T. ROWLANDS 2,553,148

MECHANISM FOR REGISTERING SHEETS BEING FED TO PRINTING MACHINES AND THE LIKE

Filed Dec. 24, 1947 3 Sheets-Sheet 3

Fig.4.

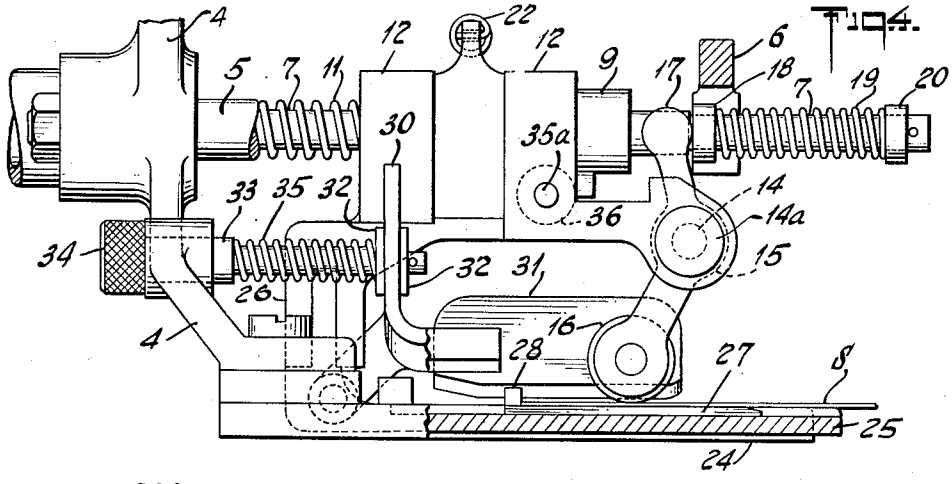


Fig.5.

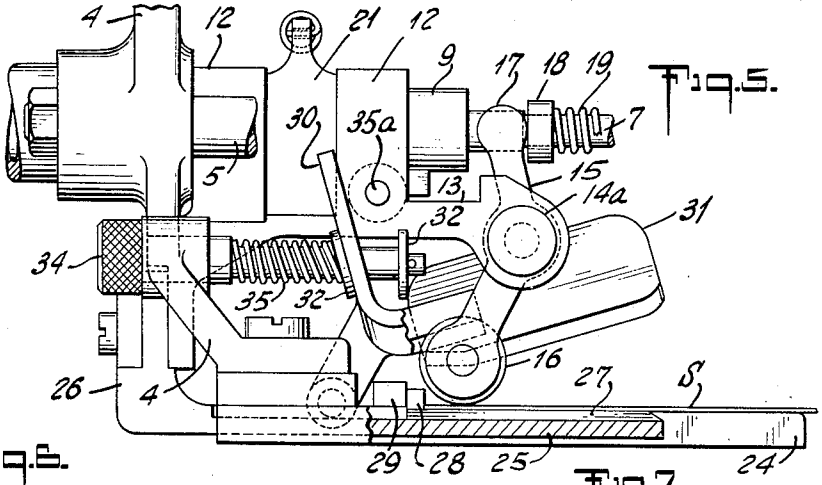


Fig.6.

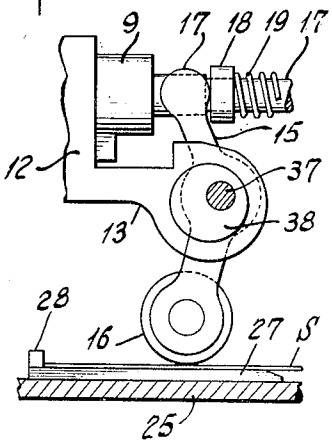


Fig.7.

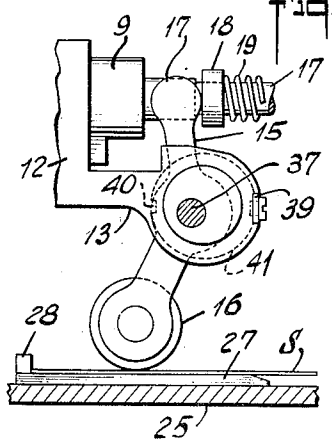
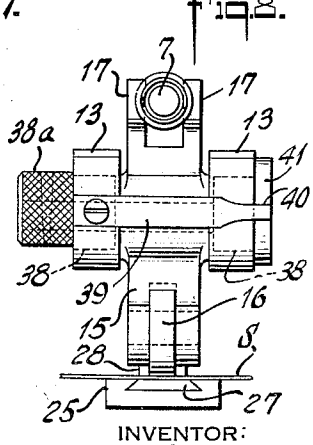


Fig.8.



INVENTOR:
TOM ROWLANDS
BY Morrison, Kennedy & Campbell,
ATTORNEYS:

Patented May 15, 1951

2,553,148

UNITED STATES PATENT OFFICE

2,553,148

MECHANISM FOR REGISTERING SHEETS BEING FED TO PRINTING MACHINES AND THE LIKE

Tom Rowlands, Hale, England, assignor to Linotype and Machinery Limited, London, England

Application December 24, 1947, Serial No. 793,704
In Great Britain December 30, 1946

5 Claims. (Cl. 271—59)

1

This invention relates to mechanism for registering sheets being fed to printing machines and the like.

To ensure that the sheets will assume a prearranged position laterally in respect to their direction of movement, the edges of the sheets are pushed or drawn against a fixed side gauge. When the sheets are side-registered in this manner, it is necessary to impart sufficient movement to the sheets for properly positioning them against the side gauge without damaging the edges of the sheets.

Prior to side-registration, the sheets may assume varying positions relatively to the fixed side gauge so that difficulty may be experienced in ensuring that the correct amount of movement is imparted to a sheet. This difficulty may be further increased when sheets of varying thickness are to be side-registered, so that a varying force is necessary to draw the sheets against the side gauge.

The present invention avoids this difficulty by carrying a slidable member towards a sheet to allow it to assume a definite position relatively to the sheet, gripping a sheet against the member, and carrying the member and sheet in the opposite direction to allow the sheet to assume a definite positon relatively to a fixed side gauge.

Mechanism devised to carry the invention into effect comprises a slidable member, a support carrying the slidable member, means for moving the support towards a sheet to allow the member to assume a definite position relatively to the sheet, means for gripping the sheet against the member, and means for moving the support in the opposite direction to allow the member and sheet to assume a definite position relatively to a fixed side gauge.

The member is freely slidable in the support and is carried thereby beneath a sheet to be side-registered. Preferably, the member is provided with an upstanding portion which is brought into engagement with the edge of the sheet as the member is carried beneath the sheet, and is brought into engagement with the fixed side gauge when the member is carried in the opposite direction, said upstanding portion remaining in engagement with the edge of the sheet or the side gauge irrespectively of the distance through which the support moves.

2

The mechanism may comprise a reciprocatory carriage to which the support is attached, and a gripping member pivoted to the carriage, said member having a roller which can grip a sheet against the slidable member and support, but which is rotatable to permit an outward movement of the support relatively to the slidable member if movement of said slidable member is arrested. The mechanism may also comprise means for varying the pressure exerted by the gripping member and roller on the sheet.

The invention will be clearly understood from the following description given by way of example, of one form which it may assume, and this description will be more readily followed by reference to the accompanying drawings wherein:

Figure 1 represents a front elevation of side-registering mechanism according to the invention;

Figure 2 is a side elevation, partly in section, of the mechanism before the positioning of a sheet;

Figure 3 is a side elevation, partly broken away, showing a slidable member brought into engagement with the edge of the sheet;

Figure 4 is a side elevation, partly broken away, showing the sheet gripped against the slidable member and about to be moved towards the fixed side gauge;

Figure 5 is a side elevation, partly broken away, showing the slidable member against the fixed side gauge;

Figures 6 and 7 are side elevations, partly broken away, of the means for gripping the sheet against the slidable member, and

Figure 8 is a front elevation, partly broken away, of the gripping means.

Referring to Figures 1 and 2 of the drawings, the side-registering mechanism comprises a device having a two-part clamping member 1 adapted to be secured by a finger-operable screw 2 whereby to clamp the device to a tube or rod 3 extending laterally of the direction of feeding movement of the paper sheets. Dependent from the lower of these clamping members is a bracket 4 having two cylindrical bores parallel with the clamping axis, each bore having secured therein a rod 5 and the outer ends of the rods being connected together by a bridgepiece 6.

An operating shaft 7 extends through, and is slidable in, another bore, which is central in the dependent bracket 4, and a housing 8 extends from one side of the bracket 4 to carry the operating shaft 7. The shaft 7 is parallel with the clamping axis and the rods 5, and has pinned to it a cross-member 9 formed with bores so as to be slidably mounted on the rods 5. A collar 10 freely mounted on the operating shaft 7 acts as a support for the said shaft in the housing 8. A compression spring 11 coiled around the operating shaft 7 extends between the end of the housing 8 and the cross-member 9, and, being under compression, normally urges the cross-member 9 towards the bridgepiece 6. This direction is inwards relatively to the side of the paper sheet on which the device is to operate.

Also slidably mounted on the rods 5 is a reciprocatory carriage 12 from which depend brackets 13 parallel with the rods 5 and forming between them a pivot 14 for a gripping member 15, the arm of which has at one end a roller 16 and the other end a fork 17 embracing the operating shaft 7 at a position adjacent the outside of the cross-member 9. A collar 18 freely mounted on the operating shaft 7 is held just clear of the fork 17 by a shoulder on the shaft, and a spring 19 extends between the collar 18 and a nut 20 whereby the degree of compression of the spring 19 can be adjusted.

From the foregoing description it will be clear that the outward movement of the operating shaft 7 (i. e. towards the left in Figure 2) draws the cross-member 9 away from the fork 17, thus allowing the gripping member 15 to be moved by the collar 18 and spring 19 about its pivot 14 until the roller 16 rests upon the sheet. Continued movement of the operating shaft 7 carries the cross-member 9 away from the fork 17, and against the reciprocatory carriage 12, to move same (with the gripping member 15 pressed downwards) in a lateral direction. The carriage 12 is slotted at the sides, and short levers 21 pivoted to the carriage 12 below these slots are adapted to bear against the portions of the rods 5 exposed through these slots, the levers 21 being urged together at their upper ends by a spring 22 extending between them. These levers 21 provide frictional forces which ensure that the carriage 12 will not move until the gripping member 15 is in its operative position and the cross-member 9 positively engages the carriage 12. Release of the operating shaft 7 allows return movement of these parts in reverse order under the action of the spring 11.

The outer end of shaft 7 is connected to suitable operating mechanism actuated by a cam (not shown) on, or driven by, the main shaft of the printing or like machine to which the registering device is fitted. In the form described a "Bowden" wire 23 is shown as providing such a means of connection.

The bracket 4 extends downwardly and carries at its lower end inwardly extending base plates 24 forming guideways for a horizontal support plate 25 attached to a downward extension 26 of the reciprocatory carriage 12. The support plate 25 is formed with guideways in which a member or plate 27 is freely slidable. The plate 27 is provided with an upstanding portion or lip 28 which can contact with the edge of a sheet. If desired, the plate 27 may have attached to the lip 28 a resilient plate which is located above the plate 27 and adapted to overlie a sheet when the edge thereof has been engaged by the lip 28.

The base plates 24 have secured thereto a fixed side gauge 29 against which the plate 27 is drawn in the manner hereinafter described.

Pivoted in slots formed in the base plates 24 are fingers 30 (see Figures 1 and 4) to which are fixed guide plates 31, which extend inwardly so as to form a guide for each sheet S as it is fed between the gripping member 15 and base plates 24. Each finger 30 (see Figure 4) is engaged between washers 32 on a pin 33 passing through a slot in the finger. The pin 33 is screw-threaded through the bracket 4 and provided at one end with a milled head 34. A compression spring 35 is coiled about the pin 33 and bears against a washer 32 and rotation of the milled head 34 effects adjustment of the sheet guide plate 31 relatively to the base plates 24. Extending from each side of the carriage 12 is a rod 35 which, on movement of the carriage 12 towards the bracket 4, contacts with a finger 30 so as to raise a guide plate 31. The rod 35 which is nearer to the printing machine to which sheets are being fed is provided with a push-on thimble 36 (see Figure 1) whereby the appropriate guide plate 31 is further raised (see Figure 2) so as not to impede the travel of the sheet when fed to the printing machine.

As will be seen from Figure 1, the pivot stud 14 is in the form of a split sping pin having a head 14a so as to allow the ready interchange of gripping members 15 of varying forms. Thus, a gripping member 15 suitable for use with paper sheets may be replaced by a gripping member suitable for use with heavier sheets or cards, said latter gripping member 15 having a more obtuse angle between the arm portion carrying the roller 16 and arm portion carrying the fork 17 in order to obtain a greater gripping pressure on the cards without any adjustment of the compression of spring 19.

Alternatively, the gripping member 15 may be adjustably and eccentrically mounted in the brackets 13, as shown in Figures 6, 7 and 8. In these figures, the gripping member 15 is loosely mounted on a pivot stud 37 having eccentric portions 38 carried by the brackets 13. The stud 37 is provided with a milled head 38 whereby the stud is rotatable to either of the positions shown in Figures 6 and 7, the stud 37 being held in its adjusted position by a spring finger 39 secured to a bracket 13 and engaging one of the notches 40 in a portion 41 of the stud. Thus, when the stud 37 is adjusted from the position shown in Figure 6 to the position shown in Figure 7, the fork 17 of the gripping member 15 is maintained in a similar position relatively to the cross-member 9, but, on operation of the gripping member 15, the arm portion carrying the roller 16 is brought to a different angular position relatively to the sheet, thus giving a decreased gripping pressure thereon.

In operation, the sheet-registering device is adjusted laterally on its rod 3 by the releasable clamp 1, the rod 3 being adjustable in the direction of movement of the sheet in order to position the sheet-registering mechanism as required. The rod 3 may, if desired, be provided with screw adjustment for micrometric lateral adjustment of the mechanism relatively to the sheet.

When the shaft 7 is operated to carry the carriage 12 and support plate 25 towards a sheet, the slidable plate 27 is carried beneath the sheet

and the upstanding portion 28 comes into contact with the edge of the sheet. After contact of the portion 28 with the edge of the sheet, further movement of the slidable plate 27 is arrested and it remains stationary during continued inward movement of the carriage 12 and support 25.

Outward movement of the operating shaft 7 causes the gripping member 15 to be moved downwardly so that the roller 16 grips the sheet against the plate 27 and support plate 25. The carriage 12 is moved in the opposite direction towards the side gauge 29 and the upstanding portion 28 is brought into contact therewith. The upstanding portion 28 is held against the side gauge 29 while the reciprocatory carriage 12 and support 25 complete the outward movement, the roller 16 being rotated by the continued outward movement of the gripping member 15 and carriage 12 and the support plate 25 moving relatively to the slidable plate 27. The gripping member 15 is raised on release of the operating shaft 7, the sheet is fed to the printing machine, and the carriage 12 is moved in the opposite direction towards the next sheet.

Having described my invention, I declare that what I claim and desire to secure by Letters Patent is:

1. Mechanism for registering a sheet being fed to a printing machine and the like comprising a carriage, mechanism for reciprocating said carriage, a support plate attached to said carriage and formed with guideways, a slidable plate which is freely mounted in said guideways, said slidable plate having an upper surface which is substantially in the same plane as the upper surface of said support plate, an upstanding lip formed on said slidable plate for engaging the edge of a sheet as said carriage is moved in one direction to carry the upper surface of said slidable plate beneath a sheet, gripping mechanism mounted on said carriage, means for operating said gripping mechanism to hold a sheet against said slidable plate and support plate as the carriage and support plate are moved in the opposite direction and a fixed side gauge against which said slidable plate is drawn when moved in said opposite direction.

2. Mechanism for registering a sheet being fed to a printing machine and the like comprising a carriage, mechanism for reciprocating said carriage, a support plate attached to said carriage and formed with guideways, a slidable plate which is freely mounted in said guideways, said slidable plate having an upper surface which is substantially in the same plane as the upper surface of said support plate, an upstanding lip formed on said slidable plate for engaging the edge of a sheet as said carriage is moved in one direction to carry the upper surface of said slidable plate beneath a sheet, a gripping member mounted on said carriage, means for moving said gripping member into and out of sheet-gripping position, a roller mounted on said gripping member for holding a sheet against said slidable plate and support plate as the carriage and support plate are moved in the opposite direction, and a fixed side gauge against which said slidable plate is drawn when moved in said opposite direction, the roller on said gripping member being rotatable by movement of said slidable plate relatively to the said support plate when the slidable plate is arrested by said fixed side gauge.

3. Mechanism for registering a sheet being fed to a printing machine and the like comprising a carriage, mechanism for reciprocating said carriage, a support plate attached to said carriage and formed with guideways, a slidable plate which is freely mounted in said guideways, said slidable plate having an upper surface which is substantially in the same plane as the upper surface of said support plate, an upstanding lip formed on said slidable plate for engaging the edge of a sheet as said carriage is moved in one direction to carry the upper surface of said slidable plate beneath a sheet, a gripping member, a pivot stud on which said gripping member is loosely mounted, eccentric portions formed on said pivot stud, bearings formed on said reciprocatory carriage in which bearings said eccentric portions are mounted, means for moving said gripping member into and out of sheet gripping position, a roller mounted on said gripping member for holding a sheet against said slidable plate and support plate as the carriage and support plate are moved in the opposite direction, means for rotatably adjusting said pivot stud on which said gripping member is mounted in order to vary the pressure exerted by said roller on a sheet, and a fixed side gauge against which said slidable plate is drawn, when moved in said opposite direction, the roller on said gripping member being rotatable by movement of said slidable plate relatively to the said support plate when the slidable plate is arrested by said fixed side gauge.

4. Mechanism for registering a sheet being fed to a printing machine and the like comprising a carriage, mechanism for reciprocating said carriage, a support plate attached to said carriage and formed with guideways, a slidable plate which is freely mounted in said guideways, said slidable plate having an upper surface which is substantially in the same plane as the upper surface of said support plate, an upstanding lip formed on said slidable plate for engaging the edge of a sheet as said carriage is moved in one direction to carry the upper surface of said slidable plate beneath a sheet, fixed base plates having guideways in which said support plate slides when said carriage is reciprocated, sheet guide plates pivoted to said base plates, means mounted on the reciprocatory carriage for raising said sheet guide plates by outward movement of said carriage, means for adjusting the extent to which either of said sheet guide plates is raised, gripping mechanism mounted on said carriage, means for operating said gripping mechanism to hold a sheet against said slidable plate and support plate as the carriage and support plate are moved in the opposite direction and a fixed side gauge against which said slidable plate is drawn when moved in said opposite direction.

5. Mechanism for registering a sheet being fed to a printing machine and the like comprising a carriage, mechanism for reciprocating said carriage, a support plate attached to said carriage and formed with a recess having undercut side walls, a slidable plate which is freely mounted in said recess, said slidable plate having sides which are shaped to form a sliding fit with said undercut side walls and having an upper surface which is substantially in the same plane as the upper surface of said support plate, an upstanding lip formed on said slidable plate for engaging the edge of a sheet as said carriage is moved in one direction to carry the upper surface of said slidable plane beneath a sheet, fixed base plates having guideways in which said support plate slides when said carriage is reciprocated, sheet guide plates pivoted to said base

plates, means mounted on the reciprocatory carriage for raising said sheet guide plates by outward movement of said carriage, means for adjusting the extent to which either of said sheet guide plates is raised, a gripping member mounted on said carriage, means for moving said gripping member into and out of sheet-gripping position, a roller mounted on said gripping member for holding a sheet against said slidable plate and support plate as the carriage and support plate are moved in the opposite direction, and a fixed side gauge against which said slidable plate is drawn when moved in said opposite direction, the roller on said gripping member being rotatable by movement of said slidable plate relatively to the said support plate when the slidable plate is arrested by said fixed side gauge.

TOM ROWLANDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
936,027	Parker	Oct. 5, 1909
1,252,604	Middleditch	Jan. 8, 1918
1,404,376	Christophel et al.	Jan. 24, 1922
1,798,240	Welter	Mar. 31, 1931