M. A. DROITCOUR.

SHEET REGISTERING MECHANISM.

APPLICATION FILED DEC. 14, 1914.

1,196,934.

Patented Sept. 5, 1916.

4 SHEETS—SHEET 1.

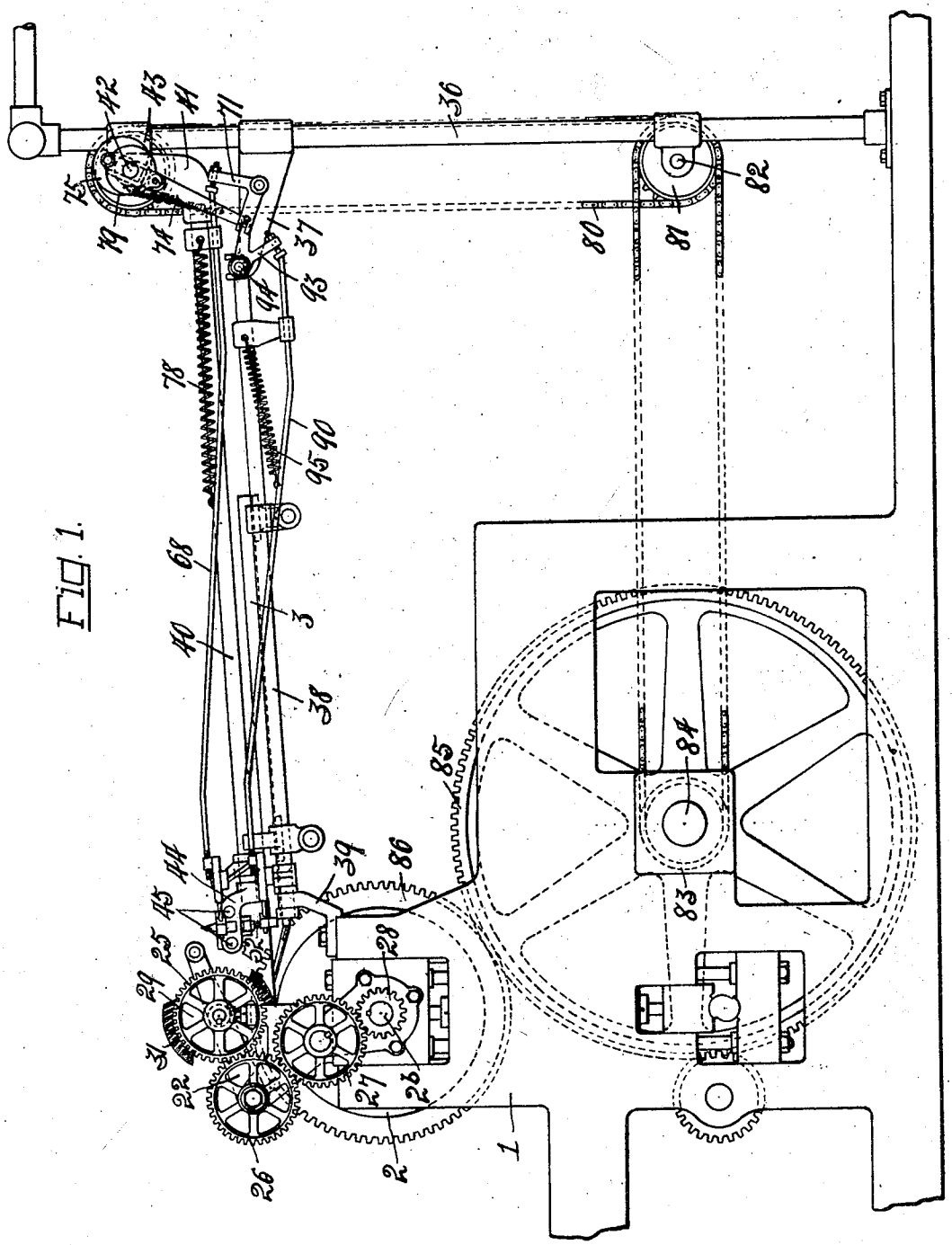


Fig. 1.

WITNESSES:—

R. G. Allen.

F. E. Aul.

INVENTOR.

Michael A. Droitcour,

By Owen, Owen & Crampton,

His attys.

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4 SHEETS—SHEET 2.

FIG. 3

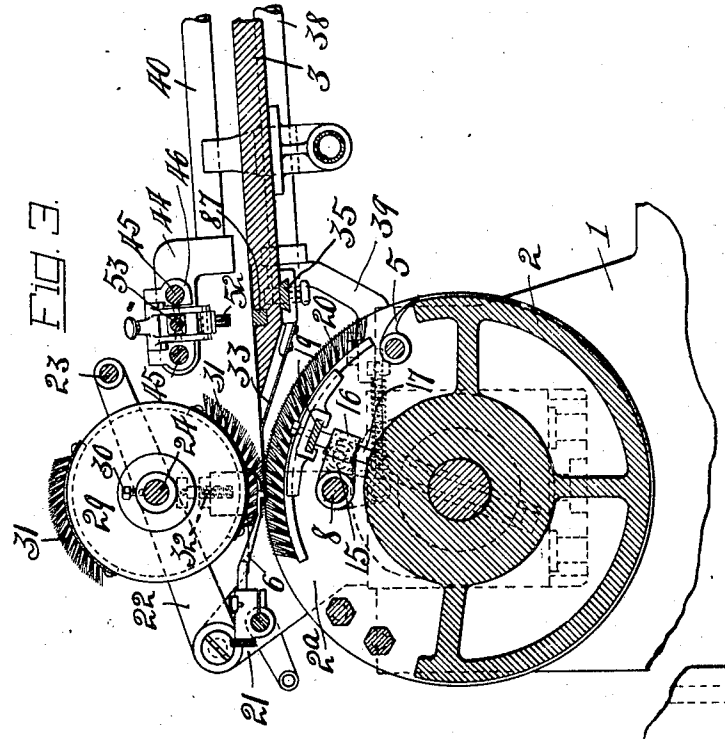
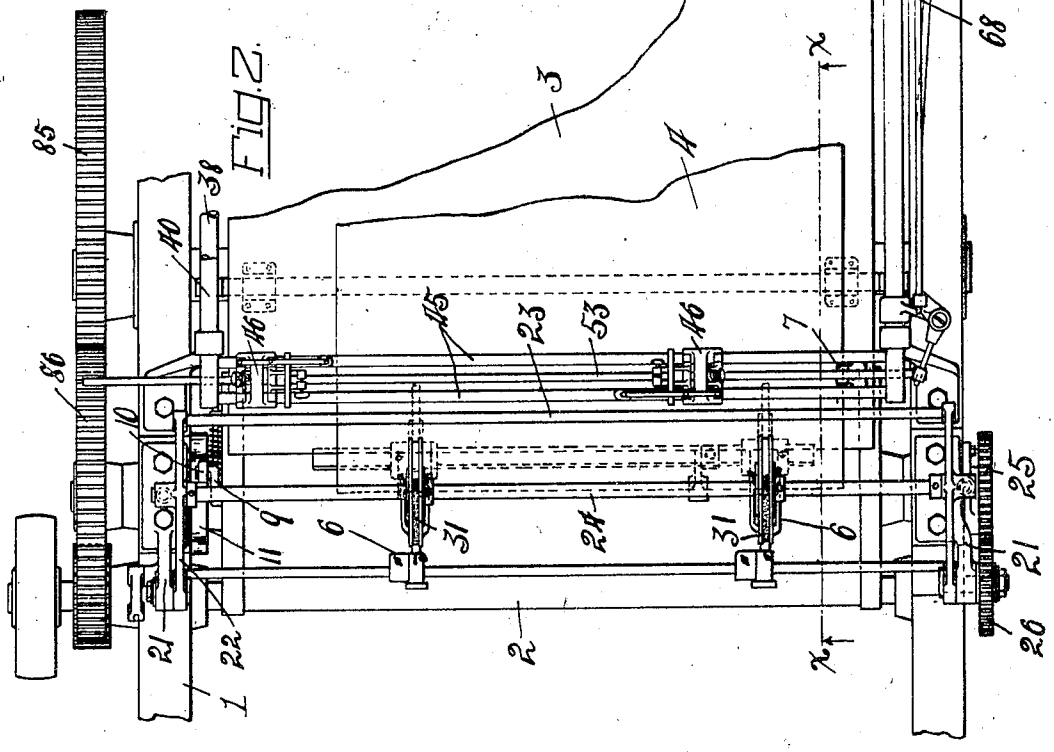


FIG. 2.



WITNESSES:—

R. G. Allen.

F. C. Aul.

INVENTOR.

Michael A. Droitcour,

By Owen, Owen & Crampton

His attys.

M. A. DROITCOUR.

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4 SHEETS—SHEET 3.

Fig. 4.

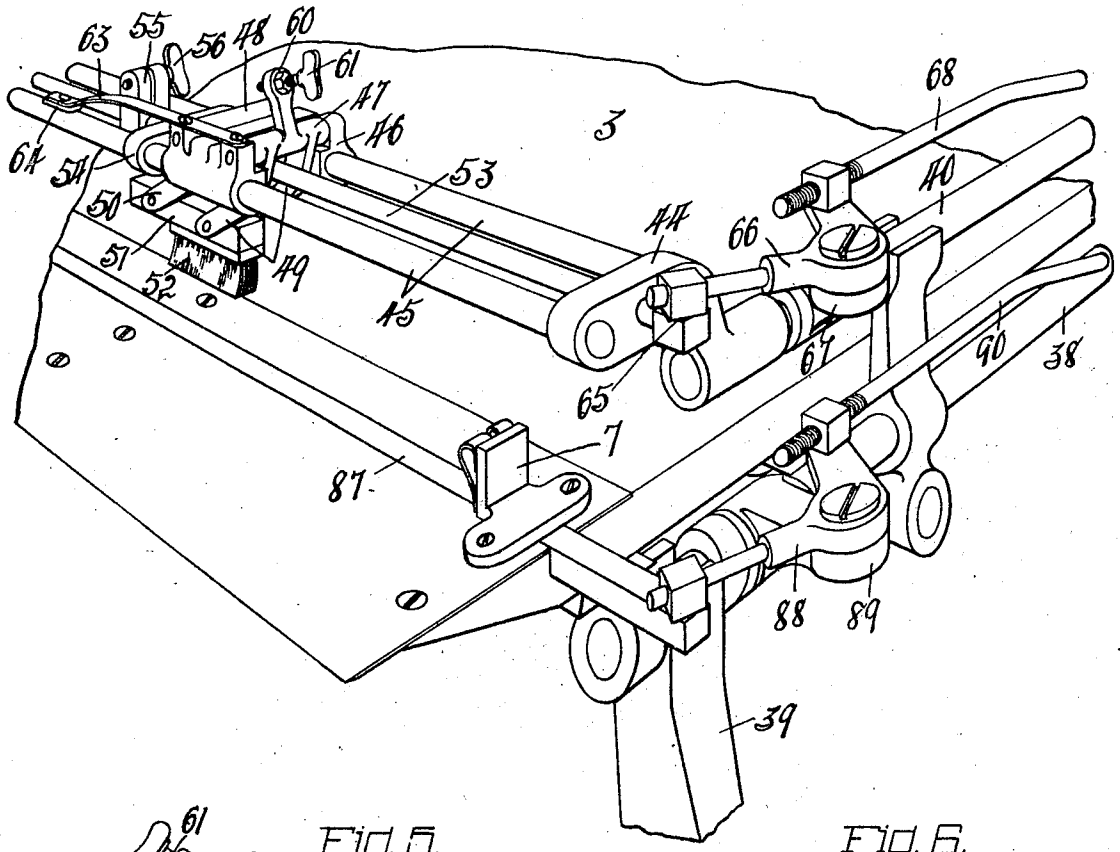


Fig. 5.

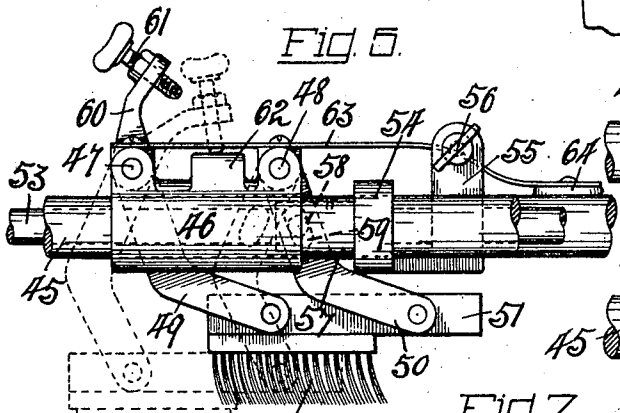


Fig. 6.

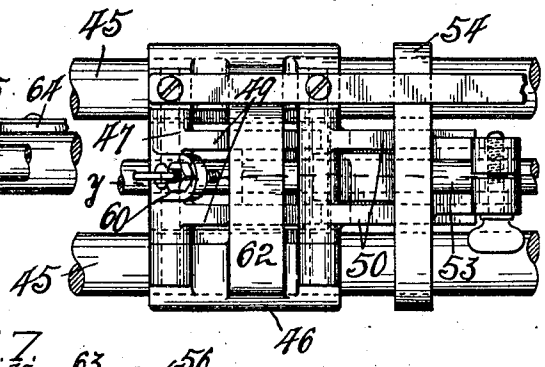
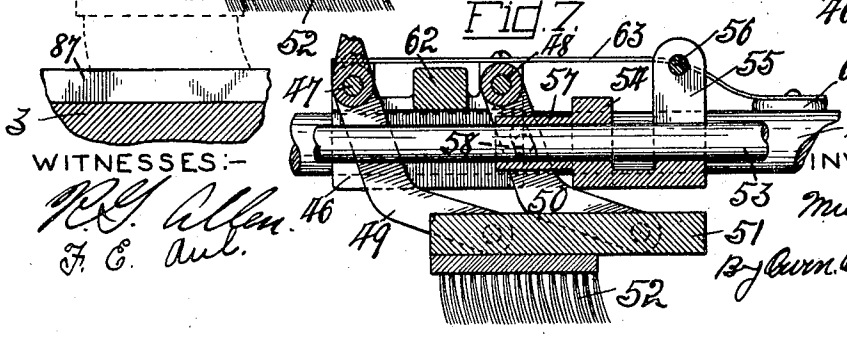


Fig. 7.



WITNESSES:—

F. C. Aul.

INVENTOR.

Michael A. Droitcour

By Dunn, Dunn & Crampton

His attys.

M. A. DROITCOUR.

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4 SHEETS—SHEET 4.

Fig. 9.

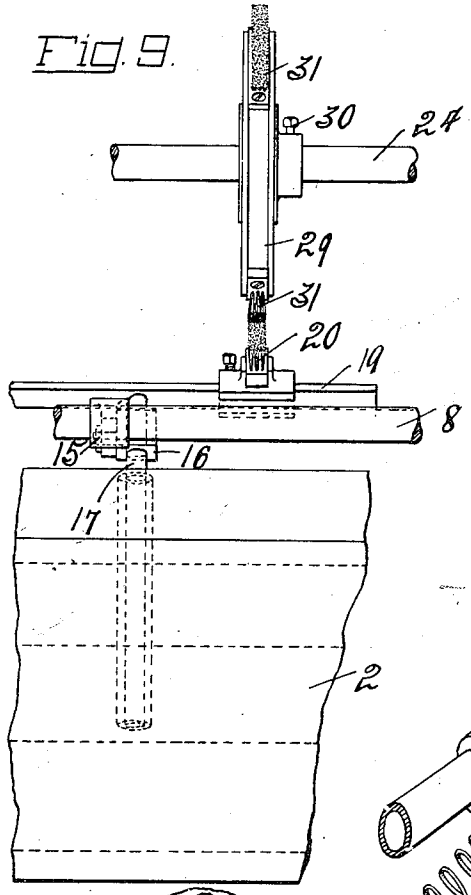
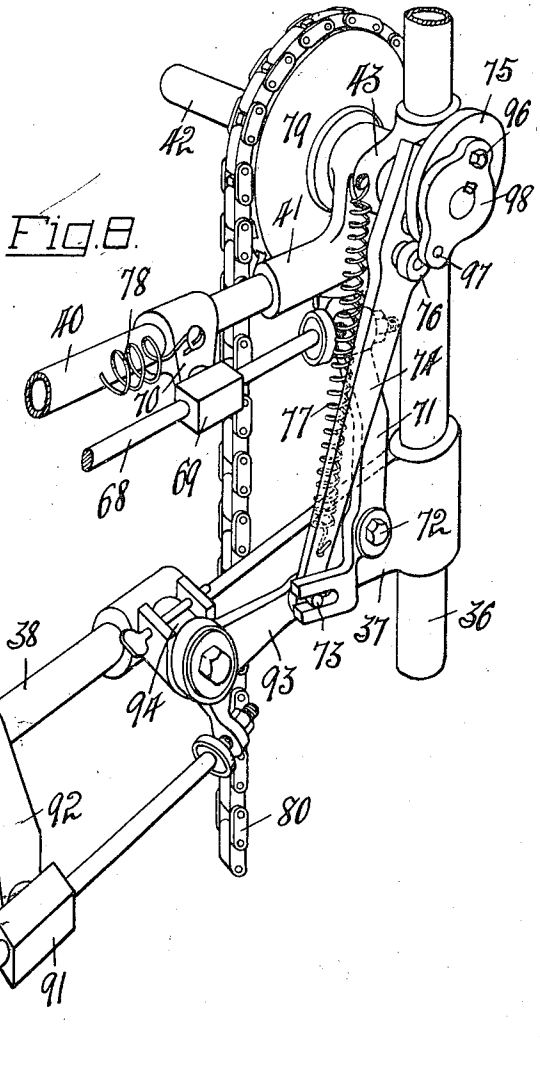


Fig. 8.



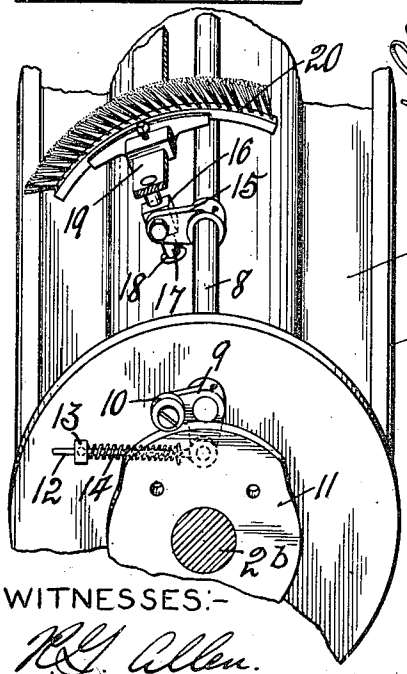
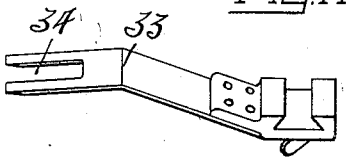


Fig. 10.

Fig. 11.



WITNESSES:-

R. G. Allen.

F. C. Aul.

INVENTOR.

Michael A. Droitcour,

By Brown, Brown & Crampton,

His attys.

UNITED STATES PATENT OFFICE.

MICHAEL A. DROITCOUR, OF DELPHOS, OHIO.

SHEET-REGISTERING MECHANISM.

1,196,934. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed December 14, 1914. Serial No. 877,138.

To all whom it may concern:

Be it known that I, MICHAEL A. DROITCOUR, a citizen of the United States, and a resident of Delphos, in the county of Van Wert and State of Ohio, have invented a certain new and useful Sheet-Registering Mechanism; 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, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates particularly to a mechanism for use in connection with printing presses for automatically registering sheets in cylinder gripping or picking-up position as they are successively fed to such position.

The object of my invention is the provision of a simple and efficient mechanism of this character, which is automatically operable, in properly timed relation to the feeding of sheets to cylinder engaging position, to effect an accurate registering of the sheets with the customary front and side gages, whereby to enhance the practicability and commercial value of presses of the character described, and the like.

Further objects and advantages of the invention will be apparent from the following detailed description of the invention.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a side elevation of a portion of a printing press and the mechanism embodying the invention in operative relation thereto. Fig. 2 is a plan view of a portion of a printing press and the registering mechanism with parts broken away. Fig. 3 is an enlarged section on the line x, x in Fig. 2. Fig. 4 is a perspective view of a portion of the registering mechanism. Figs. 5 and 6 are enlarged side and plan views of a portion of the registering mechanism. Fig. 7 is a section on the line y in Fig. 6. Fig. 8 is an enlarged perspective view of a portion of the control means of the registering mechanism. Fig. 9 is an enlarged front elevation of a portion of the cylinder and the associated parts of the registering mechanism. Fig. 10 is a perspective view of the same, and Fig. 11 is a perspective view of one of the table fingers with which the front gages coact when lowered.

Referring to the drawings, 1 designates the frame of a printing press, 2 the customary platen cylinder, and 3 the table on which sheets 4 are successively advanced by hand or automatically in any suitable manner into position for their front edges to be engaged by the gripping fingers 5 of the cylinder at a predetermined point in a revolution thereof, as is well understood in the art. The advancing movements of a sheet are stopped by the customary front gage fingers 6, 6, which are periodically raised in any suitable manner from sheet obstructing position.

7 designates the customary side registering block for the sheets, which block is mounted on the table 3 in position for a side edge of a sheet to register therewith when in proper cylinder engaging position.

The cylinder 2 has one side of its periphery open or cut away to provide a peripheral recess 2^a, which recess is customarily present in cylinders of this character. Mounted within the cylinder recess 2^a lengthwise thereof and journaled at its ends in the respective end walls of the cylinder is a rock-shaft 8, which is provided at one end without the respective cylinder end with a bell-crank lever 9, one arm of which is provided with a roller 10 that rides on the periphery of a cam 11, while the other arm thereof has a rod 12 projecting therefrom and working freely through a guide lug 13, which is fixed to the cylinder end. A coiled compression spring 14 encircles the rod 12 between the lug 13 and a stop shoulder, which shoulder is provided on the rod adjacent to its inner end, said spring exerting pressure on the lever 9 in a direction to yieldingly retain the roller 10 in contact with the cam periphery. The cam 11 loosely encircles the cylinder shaft 2^b, and is fixed to the adjacent frame side by pins, or in any other suitable manner, whereby the cam is held stationary relative to the frame, and the roller 10 is

permitted to revolve therearound as the cylinder revolves. The cam 11 is provided at a predetermined point on its periphery with a protuberant portion which causes a rocking of the lever 8 in first one direction and then the other at each revolution of the cylinder due to the roller 10 traveling onto and from said protuberant portion.

Projecting from the shaft 8 at points within the cylinder recess 2^a, are, in the present instance, two rocker-arms 15, which are disposed in tangential relation, or substantially so, to a circle struck from the cylinder axis. Each arm 15 is pivotally connected at its outer end by a block 16, in the present instance, to a rod 17 which is disposed in radial relation to the cylinder and has its inner end working in a registering radially-disposed guide-socket 18 in the core portion of the cylinder (see Figs. 3, 9 and 10). The rods 17 are fixed at their outer ends to a bar 19, which extends lengthwise of the cylinder within the recess 2^a. This bar carries one or more segmental sheet registering brushes 20, which, in the present instance, are two in number, with their bristles projecting outwardly relative to the cylinder and arranged in the form of an arc or segment of the cylinder periphery. The brushes or registering elements 20 are adjustable lengthwise of the bar 19 to facilitate a placing of the same to suit the size of the sheet being operated on. It is evident that the brushes 20 will have inward and outward radial movements relative to the cylinder upon a rocking of the shaft 8, and that with the present arrangement the brushes will be moved to their outward or operative position when the roller 10 rides upon the protuberant portion of the cam 11, and will stand in retracted or inoperative position within the cylinder recess 2^a when the roller 10 is riding on the retracted or neutral portion of the cam 11. The outward throw of the brushes is sufficient to place the outer edges of their bristles slightly beyond the peripheral line of the cylinder in position to have contact with the under side of the forward edge portion of a sheet 14 which is fed to front gage coacting position or substantially so, as shown in Fig. 3.

Rising from the side portions of the press frame 1 adjacent to the cylinder ends are bearing arms 21, 21 to each of which is pivoted an arm 22. The arms 22 are rigidly connected at their free ends by a bar 23 forming a handle to facilitate a swinging of the arms. Mounted at its ends in suitable bearings provided in the respective arms 22 intermediate the ends thereof is a shaft 24, which, when the arms 22 are swung to the rearward operative position shown in Fig. 3, stands over the cylinder 2. One end of the shaft 24 projects beyond the respective arm 22 and carries a gear 25 which is driven by and adapted to revolve about a gear 26 in concentric relation thereto when the arms 22 are swung on their pivots, the gear 26 being mounted on a stub-shaft with one of the arms 22. The gear 26 has connection through a pinion 27 with a small drive gear 28 that is mounted on the adjacent end of the cylinder shaft 2^b.

A registering wheel 29 is mounted on the shaft 24 for each cylinder brush or registering element 20, being secured to the shaft by a set-screw 30, which facilitates an adjustment of the wheel on the shaft to suit the position of the cylinder brush. Each wheel 29 is provided on its periphery, in the present instance, with two segmental sets of brush bristles 31, which sets are arranged at opposite sides of the wheel axis and adapted to have peripheral coaction with the respective brushes 20 of the cylinder when the cylinder and wheels 29 are being driven. The proportion of the gears in the train which connects the cylinder shaft to the brush wheel shaft 24 is such that the cylinder will revolve twice for each single revolution of the brush wheels 29. It will thus be seen that the two brushes 31 of a wheel 29 will coact with the respective cylinder brush 20 at alternate revolutions of the cylinder for the purpose hereinafter described. As the peripheral speed of the cylinder brushes 20 is approximately four times greater than the speed of the wheel brushes 31, the wheel brushes are preferably made proportionally shorter than the cylinder brushes. The difference in the speed of rotation of the brushes 20 and 21 causes a slowing down of the sheets as they move into contact with the front gages, thereby preventing injury to the leading edges of a sheet when striking the gages. It will be noted that one of the brushes 31 (the lower one in Fig. 3) is longer than the other. The long brush 31 is the one which first has contact with a sheet, as it is the front end of this brush that is intended to coact with and to act to slow down a sheet before the cylinder brush contacts therewith.

It is preferable in practice to incline the bristles of the brushes rearward from radial lines of the respective brushes relative to the direction of rotation of the carrying parts, or, in other words, toward an advancing sheet when the brushes are in sheet coacting position, as indicated in Fig. 3. The bristles are thereby caused to have a greater retarding action on the advancing sheet when its forward edge moves into contact therewith than would be the case if the bristles were disposed in true radial planes. As the forward edge of a sheet advances between the coacting brushes 20 and 31 its advancing movement, if rapid, is first retarded thereby and the sheet is then drawn to the front registering gages 6, 6 by the

yielding gripping and forward moving action of the coacting brushes. When the front edge of a sheet has been moved by the registering brushes into contact with the front gages 6 the brushes will then have sliding contact with the sheet, for, while the gripping action of the coacting brushes is sufficient to draw a sheet into front gage coacting position, it is not sufficient to cause a continued forward movment of the sheet and consequent wrinkling of the sheet when it moves into stop contact with the front gages.

The brush wheels 29 are held in proper vertical adjustment relative to the cylinder periphery by stop-screws 32 which are threaded in respective side portions of the frame 1 and rise therefrom in position to coact with the bearings for the shaft 24 in the respective arms 22, whereby to limit the rearward swinging movements of said arms. A downward turning of the screws 32 permits a movement of the wheels 29 toward the cylinder.

Projecting forward from the front edge of the table 3 are a plurality of sheet supporting fingers 33, with which the front gages 6 coact when lowered, as is customary in presses of this character. The fingers 33 project in position to enter between the cylinder and wheel brushes 20 and 31 when in coacting relation, and such fingers have their free ends forked or longitudinally notched, as shown at 34, (Fig. 11) to permit the brush bristles to project therethrough when in sheet gripping position. The provision of the forked fingers 33 for each set of registering brushes steadies a sheet at the opposite sides of the points of gripping thereof by the brushes. The fingers 33 are adjustably carried at their inner ends by a bar 35 for adjustment transversely of the table to suit the positions of the brush sets and of the front gages 6.

Rising, in the present instance, from each of opposite sides of the press-frame 1 at the rear of the table 3 is a standard 36 (one only being shown) having a bearing arm 37 projecting forward therefrom. A frame 38 is pivotally carried at its rear end by the bearing-arms 37 of the respective standards, and this frame carries at its forward end the table 3. When the table 3 is in operative relation to the cylinder the forward end of the frame 38 is supported by brackets 39 rising from the respective sides of the press frame. Disposed above each side portion of the frame 38 is a frame-bar 40 which extends rearward from the forward edge portion of the table 3 to adjacent the respective standards 38, and are provided at their rear ends with upwardly angled arms 41 which are loosely carried by a shaft 42 that is journaled at its ends in bearing-arms 43 projecting from the respective standards 36 above the bearing arms 37. Each bar 40 is provided at its forward end with a bracket-arm 44 projecting upward and forward therefrom. The arms 44 of the two side bars 40 are rigidly connected transversely of the table over the forward edge portion thereof by a pair of transversely spaced bars 45, which bars coact with the arms 44 and side bars 40 to form a frame which is capable of being raised and lowered relative to the table 3 and its supporting frame, the raising and lowering movements of said upper frame taking place about the shaft 42 as an axis.

Mounted for sliding movements on the two bars 45, transversely of the table 3, is a slide head 46 which carries a pair of shaft parts or rocker members 47 and 48, the ends of which have bearings in the respective sides of the head 46, said rocker members 47 and 48 being disposed transverse to the sliding movements of the head 46 and spaced longitudinally of such movements. Each of the members 47 and 48 have pairs of arms 49 and 50 projecting downward therefrom and pivotally attached at their lower ends to a block 51, whereby a rocking movement in unison to the respective arms and raising and lowering swinging movements to the block 51, which, during such movements, is held in horizontal position by said arms, as is apparent by reference to the drawings. The block 51 is carried between the arms of the respective pairs and is provided on its bottom surface with a yielding wiping member 52, which, in the present instance, is in the form of a brush, the bristles of which project downward toward the table 3. A longitudinally movable rod 53 is disposed between the frame bars 45 in parallel relation thereto and has its ends slidingly mounted in the respective frame arms 44. This rod projects through the slide head 46, in the present instance, below the rocker members 47 and 48 and between the arms 49 and 50 of each pair. A cross-arm 54 has its ends slidingly mounted on the respective frame bars 45 at one end of the slide head 46 and has a split part 55 projecting therefrom and embracing the slide rod 53 to which it is fixedly clamped by a screw 56, whereby the cross-arm is caused to have reciprocatory movements with the rod 53. A sleeve 57 projects from the opposite side of the cross-arm 54 to the clamping part 55 and has pivot studs 58 projecting from opposite sides thereof and into registering slots 59 in the arms 50, the slots 59 extending lengthwise of said arms. It is thus apparent that a shifting movement of the rod 53 relative to the slide head 46 will effect a raising and lowering of the brush or wiping element 52 relative to the table 3.

Projecting upward from the rocker mem-

ber 47, in the present instance, is an arm 60 which carries an adjustable stop-screw 61 at its outer end in position for one end of such screw to have contact with a registering stop portion 62 of the head 46, whereby to stop the downward swinging movements of the arms 49 and 50 when the attached block 51 has been lowered a predetermined distance. When the rod 53 is moved to effect a lowering of the brush or wiping element 52 it is intended that the cross-arm 54 will first be moved thereby relative to the head 46 to effect a lowering of the wiper element 52 and that the head 46 shall not have movement with the rod until the stop screw 61 has moved into contact with the stop 62, after which the head and cross-arm move together as a single unit with the rod 53 during a continuance of its movement. In order that the retarded movement of the head 46 relative to the cross-arm 54 shall not take place until the wiper element 52 has reached the limit of its lowering movement the head 46 is provided with a drag, which has sliding frictional contact with one of the frame bars 45, such drag, in the present instance, comprising a spring finger 63, which trails from one side of the head 46 and has its free end provided with a felt or other frictional part 24 in sliding contact with the frame bar, as shown in Figs. 4, 5 and 7. The unitary movement of the carrying and control parts for the wiper element 52 are toward the side sheet gage 7 and the downward swinging movements of the wiper element are also in the same direction.

One end of the reciprocatory rod 53 is pivotally connected, as at 65, to one arm of a bell-crank lever 66, which is pivoted for horizontal movements to a bracket arm 67 projecting from the adjacent frame bar 40, and has its opposite arm pivotally connected to a rod 68. This rod projects rearward through a guide block 69, which is pivotally carried by a bracket arm 70 projecting from the rear portion of the adjacent frame bar 40, and the rear end of the rod 68 is connected to the upright arm of a bell-crank lever 71 (see Figs. 1 and 8). The lever 71 is pivoted for vertical movements to the adjacent bearing-arm 37, as at 72, and has one arm projecting forward from such pivot and forked at its free end to straddle a pin 73 on the lower end of a reciprocally movable thrust bar 74. The bar 74 extends upward from its point of connection with the lever 71 and has its upper end forked and straddling the shaft 42, whereby its reciprocatory movements are guided by said shaft. A cam 75 on the shaft 42, when rotating with said shaft, coacts with a roller 76 on the bar 74 to impart positive outward reciprocatory movements to the bar. A coiled contractile spring 77 connects the outer end portion of the bar to a stationary frame part, as for instance, the bearing arm 43, and serves to urge the bar 74 toward the shaft 42, whereby to hold the roller 76 in contact with the periphery of the cam 75. A coiled contractile spring 78 extends forward from the frame bracket 70 and is connected at its forward end with the rod 68, whereby to coöperate with the spring 77 to retain the parts in retracted position, in which position the wiper element 52 stands raised relative to the frame bars 45.

The shaft 42, in the present instance, carries a sprocket-wheel 79, which has connection through a chain 80 with one of a pair of sprocket-wheels 81, which are mounted on a subjacent shaft 82, the other of said pair of sprocket wheels 81 having chain connection with a sprocket-wheel 83 on the shaft 84 of the press. The shaft 84 also has drive connection with the cylinder 2 through gears 85 and 86.

Mounted in the surface of the table 3 below the wiping element 52 is a sheet registering bar 87, which is reciprocally movable transversely of the table and has its top surface flush with the top surface of the table. The end of the bar 87, which is adjacent to the end of the reciprocatory rod 53 attached to the lever 66, extends beyond the side edge of the table and has pivotal connection with the upwardly projecting arm of a bell-crank lever 88. This lever is fulcrumed to a bracket-arm 89 projecting from one side bar of the lower table supporting frame 38 and has an arm projecting inward toward the table and in pivotal connection with a rod 90, which extends rearward therefrom through a pivotal guide-block 91, which block is carried by a bracket arm 92 projecting from the rear end portion of the adjacent side bar of the frame 38. The rear end of the rod 90, after projecting through the guide-block 91, is connected to the downwardly projecting arm of a bell-crank lever 93, which is loosely mounted on the adjacent pivot stud 94, which is mounted in the free end of the adjacent bearing arm 37 and forms the supporting pivot for one side of the frame 38. The lever 93 has a rearwardly projecting arm pivotally engaging the pin 73 on the thrust bar 74. It is thus evident that reciprocatory movements of the bar 74 will communicate rocking movements to both levers 71 and 93 and cause simultaneous reciprocatory movements to be imparted to the rod 53 and bar 87 through the respective intermediate connections, said connections being such as to impart like movements to said rod and bar. In other words, the connections between the bar 74 and the respective reciprocatory members 53 and 87 are such, in the present instance, that an outward movement of the bar 74 relative to the shaft 42 will impart like longitudinal movements in unison to said members

toward the side sheet gage 7, and that inward movements of the bar 74 will cause said members to return to their normal at-rest positions. A coiled contractile spring 95 projects forward from the frame arm 92 and attaches at its forward end to the rod 90 to assist in returning the bar 87 and associated operating parts to normal position. The separately connecting of the bar 74 with the parts 45 and 87 in the manner shown enables the table frame 38 and the upper frame 40—45 with the respective parts carried thereby to be independently raised and lowered on their pivots without disconnecting the registering mechanism.

In order to adapt the side registering mechanism to register a sheet with a side gage 7 disposed at either side edge of the sheet two slide-heads 46 and the associated wiper elements and the carrying and control parts thereof are mounted on the slide bars 45, one being reversed with respect to the other, as shown in Fig. 2. It will be understood that only one of these units is operated at a time, the other having the clamping part 55 of its cross-arm 54 loosened with respect to the reciprocatory rod 53 to permit such rod to slide freely through the cross-arm without imparting movements thereto. When it is desired to use the registering unit at the right side of the table the operating cam 75 is given a half turn on the shaft 42 so that the properly timed registering movements will be imparted to such unit. To adjust the cam 75 it is only necessary to remove the holding screw 96 and after turning the cam engage it therewith through an aperture 97 at the opposite side of a fixed collar 98 on the shaft.

The operation of my improved registering mechanism is as follows: When a sheet 4 has advanced in the proper feeding order to near the front gages 6 the forward edge of the sheet will be engaged on its under side by the cylinder brushes 20 and on its upper side by one of the revoluble brushes 31 of each of the upper brush sets and the sheet thereby caused to move into register with the front gages. While the yielding frictional engagement of the brushes with the sheet is sufficient to advance the sheet to the gages when free to move, it is not sufficient to effect a further advancing and consequent wrinkling of the sheet when in engagement with the stop gages 6. Immediately upon the releasing of the forward edge of the sheet by the brushes 20 and 31 first engaging the same, the cam 75 will act on the bar 74 to effect a movement of the rod 53 and bar 87 toward the side gage 7 with which the sheet is to be placed in side register. The inward movement of the rod 53 from its normal inoperative position imparts a sufficient movement to the fixedly connected cross-arms 54 relative to the associated head 46 to effect a downward swinging of the yielding brush or wiper element 52 into contact with the top surface of the sheet in opposition to the slide bar 87, thus effecting a yielding engagement of the sheet between the registering elements 52 and 87. When the element 52 has been lowered into sheet coacting position the limit of movement of the cross-arm 54 relative to the head 46 will have been reached so that the head, cross-arm and associated registering element 52 will then move together as a unit during the continued outward movement of the rod 53, with the element 52 in engagement with the sheet in opposition to the bar 87 and moving at the same speed as said bar. The engagement of a sheet by the coacting registering elements 52 and 87 will cause a transverse shifting of the sheet into register with the side gage 7, and when the sheet has been so moved the elements 52 and 87 will slide in engagement with the sheet during the continued movement of such elements. Upon a reversing of the rod 53 the cross-arm 54 will first be moved outward relative to the head 46 to raise the element 52 from engagement with the sheet after which the associated parts will be returned as a unit to at-rest position. When the sheet has been released by the side registering means the cylinder brushes 20 will have completed a complete revolution with the cylinder and the wheels 29 a half revolution, thus causing the cylinder brushes and the other set of brushes to engage the front edge of the sheet and move it into register with the front gages 6 should it have been moved out of register therewith by the action of the side registering means. It is thus evident that at one revolution of the cylinder 2 its brushes 20 have initial sheet registering coaction with one set of brushes 31 and that at the next revolution of the cylinder the brushes 20 thereof have final sheet registering coaction with the other set of brushes 31, thereby insuring a perfect register of a sheet with the front gages after a moving of the sheet into register with the side gage. It will be understood that the cylinder brushes 20 normally stand retracted within the cylinder recess 2^a and are moved outward into sheet coacting position only when the brushes are traversing the upper portions of their revolutions due to the protuberant portion of the cylinder-brush controlling-cam 11 being permanently disposed at the upper side of the cylinder shaft.

I wish it understood that while I have particularly shown the sheet coacting elements 20, 31 and 52 as being in the form of brushes my invention contemplates the use of any element of a yielding nature which will have a brushing or combing

action on a sheet to move it into register with the respective gages. It is found in practice, however, that the best results are obtained by the use of brushes, as the bristles thereof are sufficiently yieldable to prevent a tearing or injury of a sheet and to slide in contact therewith when the sheet has been moved to gage coacting position. It is also to be understood that my invention contemplates the use alone of either the cylinder registering elements 20 or the use of an upper set of registering elements 31, as in either case the wiping or frictional action of the elements against the sheet surface will tend to advance the sheet into gage coacting position. It will be appreciated, however, that the engaging of a sheet by opposed sets of brushes will effect a more positive advancing action of the sheet than if the sheet is engaged by a brushing or wiping element at one side only thereof.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications without departing from the spirit thereof.

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

1. The combination with the cylinder of a printing press, of sheet registering means having opposed revoluble sheet wiping parts which coöperate to move the sheet and are driven at different speeds.

2. The combination with a printing press cylinder, of a sheet registering element movably carried thereby for wiping coaction with the under side of a sheet at cylinder picking up position, and means operable to impart bodily inward and outward movements to said element at predetermined points in a revolution thereof to move it into and out of sheet coacting position.

3. The combination with a printing press cylinder, of a segmental sheet registering element carried by the cylinder for inward and outward movements relative thereto and for wiping coaction with the under side of a sheet, and means operable to impart bodily inward and outward movements to said element at predetermined points in a revolution of said cylinder, and movable means opposed to said element for coöperating with it to move a sheet forward into registering position.

4. The combination with a cylinder to which sheets are intermittently fed to be picked up thereby, of a sheet registering element carried by the cylinder for having periodical wiping action on sheets fed to the cylinder to urge them forward into cylinder picking up position, said element having inclined sheet coacting bristles.

5. The combination with a cylinder to which sheets are intermittently fed to be picked up thereby, of a sheet registering brush carried by the cylinder for having wiping action on sheets fed to the cylinder to move them into cylinder picking up position.

6. The combination with a cylinder to which sheets are intermittently fed to be picked up thereby, of a sheet registering brush carried by the cylinder for having yielding wiping action on sheets fed to the cylinder to move them into cylinder picking up position, and means operable to impart periodical inward and outward movements to said brush relative to the cylinder during a revolution thereof.

7. The combination with a cylinder to which sheets are intermittently fed to be picked up thereby, said cylinder having a peripheral recess, of a member mounted for inward and outward movements in said recess and when at its outward position and at a predetermined point in its revolution adapted to have yielding wiping engagement with a sheet fed to the cylinder to place it in proper register, and means operable during a revolution of the cylinder to impart periodical inward and outward movements to said member.

8. The combination with a continuously rotating printing press cylinder having a peripheral recess, of a bar mounted in said recess longitudinally thereof, sheet wiping members carried by said bar and adjustable thereon, and means operable during a revolution of the cylinder to periodically move said bar inward and outward relative to the cylinder periphery.

9. The combination with a printing press cylinder, of a sheet registering brush carried thereby and having its bristles inclined in opposed direction to the direction of rotation of the cylinder.

10. In a printing press, a revoluble member mounted to have intermittent forward wiping coaction with sheets fed to cylinder picking up position.

11. In a printing press, a revoluble sheet registering brush having the bristles thereof inclined in a direction opposed to the direction of revolution of the brush and operable to have intermittent wiping coaction with sheets fed to cylinder picking up position.

12. In a printing press, the combination with front sheet gaging means, of a frame mounted for swinging movements over the press cylinder, and a sheet wiping element revolubly carried by said frame in position to have wiping coaction with sheets to place them in register with said gage means, said element having circumferentially spaced sets of sheet wiping bristles.

13. In a printing press, the combination with a cylinder and a front sheet gage, of

a brush carried by the cylinder, the bristles of said brush intermittently working through a part of the gage when the cylinder is rotated to coact with the front edge portion of a sheet to place it in register with the gage.

14. In a printing press, a rotatable element and a plurality of sheet registering brushes carried by said element and adapted to have spaced successive forward wiping coaction with each sheet fed to cylinder picking up position.

15. In a printing press, the combination with front sheet gaging means, of a plurality of revoluble forward sheet wiping elements operable to successively act in spaced order on a sheet fed to said means to place it in register therewith.

16. In a printing press, the combination with front gaging means, of a plurality of brush like sheet wiping elements which are revolubly movable to successively act in spaced order on a sheet fed to said gage means to draw it into register therewith.

17. In a printing press, the combination with a front sheet gage, of a brush the bristles of which work through a part of said gage and being operable to coact with the front edge portion of a sheet to place it in register with the gage.

18. In a printing press, the combination with a front sheet gage, of brush members conjointly operable for opposing coaction with a sheet through a portion of the gage to move the sheet into register with the gage.

19. In a printing press, a front sheet gage, and a revoluble member having brush bristles for forward wiping coaction with a sheet through a portion of said gage to yieldingly move the sheet into register with the gage.

20. In a printing press, a platen cylinder, a sheet registering brush carried thereby, and a revoluble brush for coacting with said cylinder brush to impart registering movements to a sheet fed therebetween, said revoluble brush being driven at a slower speed than the cylinder brush and disposed to coact at its front end with a sheet to effect a slowing down of the sheet before the cylinder brush acts thereon.

21. In a printing press, a front sheet gage, a cylinder, a sheet wiping member carried by the cylinder for intermittent coaction with a sheet fed to said gage and revoluble wiper means coacting with said cylinder wiper member to urge a sheet into register with said gage, said revoluble means having slower rotation than said cylinder.

22. In a printing press, the combination with a cylinder and front gage means having a forwardly projecting finger provided with a forked end, of a brush carried by said cylinder in position for its bristles to have a forward wiping action on a sheet through the forked end portion of said finger at spaced intervals during a rotation of the cylinder.

23. In a printing press, the combination with a sheet gage, of means having revoluble sheet wiping parts for opposed coaction with sheets fed to said gage to draw them into register therewith, said means being disposed adjacent to the sheet gage to engage a sheet when near registering position and having one wiping part carried by the press cylinder.

24. In a printing press, the combination with a gage, of means having opposed revoluble sheet wiping members for opposed engagement with sheets fed to said gage to draw them into register therewith, said members being disposed adjacent to the gage having yieldable sheet coacting surfaces to have a yielding rubbing instead of a positive pulling action on a sheet.

25. In a printing press, the combination with a sheet gage, of means having revoluble brush members for opposed brushing engagement with sheets fed to said gage to draw them into register therewith.

26. In a printing press, the combination with a sheet gage, of a revoluble sheet registering member, and a plurality of revoluble registering members operable for alternate coaction with said first member at successive revolutions thereof to draw a sheet fed to said gage into register with the gage.

27. In a printing press, the combination with a sheet gage, of a revoluble member, and means having a plurality of revoluble sheet wiping parts for alternately coacting with said registering member at successive revolutions thereof to move a sheet which has been fed to said gage into register therewith, said sheet coacting member and parts being of brush like form.

28. In a printing press, the combination with a sheet gage, of a plurality of segmental brushes, a portion of said brushes revoluble about one axis and another portion revoluble about another axis, said brush portions having periodical coaction with sheets fed to said gage to place the same in register therewith.

29. The combination with a printing press cylinder, of sheet wiping means movably carried thereby and revoluble therewith, and means separate from said cylinder and revoluble to coact with sheets in opposition to said cylinder means to engage and draw them into cylinder picking up positions.

30. In a printing press, the combination with a cylinder and a sheet gage, of a yielding sheet wiping part carried by said cylinder for revoluble movements therewith, and means for periodically coacting with said wiping part to move sheets which have

been fed to said gage into register therewith.

31. In a printing press, the combination with a cylinder and a sheet gage, of a sheet wiping part carried by said cylinder, means revoluble at a speed which is differential to the speed of revolution of said cylinder and having a plurality of sheet wiping parts for wiping coaction with a sheet in opposition to the wiping part of said cylinder to register a fed sheet with said gage, the wiping parts of said means alternately coacting with the wiping part of said cylinder during successive revolutions of the cylinder.

32. In a printing press, the combination with a cylinder and a sheet gage, of a segmental brush carried by said cylinder in position to have wiping coaction with a sheet fed to said gage, of means revolubly mounted above the cylinder and operable to coact with said cylinder brush to register a coacting sheet with said gage.

33. In a printing press, the combination with a cylinder and a sheet gage, of a sheet registering member carried by said cylinder for inward and outward movements relative thereto, means operable to impart periodical inward and outward movements to said member, and means for coacting with said member at predetermined intervals and when at the limit of its outward movement for placing a fed sheet into register with said gage.

34. In a printing press, the combination with a sheet gage, and a cylinder having a peripheral recess, of a brush mounted for inward and outward movements, means for imparting inward and outward movements to said brush, and means for periodically coöperating with said brush when in its outer position to coact with a fed sheet and place it in register with said gage.

35. In a printing press, a gage, a cylinder, a brush revoluble with said cylinder, and means operable at successive revolutions of the cylinder to coöperate with said brush to impart first initial and then final gage registering movements to a sheet fed to said gage.

36. In a printing press, a cylinder, a sheet gage, a sheet wiping member carried by said cylinder, and separate means revoluble in unison and operable to coöperate with said member at successive revolutions to impart initial and final registering action to a sheet fed to said gage.

37. In a printing press, the combination with a cylinder and a sheet gage, of a sheet wiping member carried by and revoluble with said cylinder, and means mounted above the cylinder and having spaced wiper parts movable in unison, one of said wiper parts coacting with said member during one revolution of the cylinder to impart initial registering movement to a sheet fed to said gage and said other part coacting with said member at a succeeding revolution thereof to impart final sheet registering movements to the sheet.

38. In a printing press, the combination with a cylinder and a sheet gage, of a sheet wiping brush mounted for revoluble movements over said cylinder and operable to periodically coact with said cylinder brush to impart gage registering movements to a sheet fed to said gage.

39. In a printing press, the combination with a cylinder and a sheet gage, of a sheet wiping brush carried by said cylinder, and a plurality of sheet wiping brushes mounted for revoluble movements above the cylinder and operable to successively coact with said cylinder brush at different revolutions of the cylinder to register sheets with said gage.

40. In a printing press, the combination with a cylinder and a sheet gage, of means rotatably mounted above said cylinder and having a plurality of circularly spaced sheet wiping brushes, a segmental brush carried by said cylinder for radial movements therein to move it into and out of position to have contact with said first mentioned brushes whereby said cylinder brush and other brushes are operable at predetermined intervals to register sheets with said gage, and means operable to periodically move said cylinder brush inward and outward relative to the cylinder.

41. In a printing press, the combination with a cylinder and a sheet gage, of a segmental brush carried by said cylinder, and a brush mounted for revoluble movements above the cylinder in position to coöperate with said cylinder brush to register interposed sheets with said gage, said brushes having their bristles inclined in an opposite direction to the direction of sheet registering movements thereof.

42. In a machine of the class described, a stationary sheet gage, a sheet wiping brush, and means normally holding said brush out of sheet engaging position and operable to move the brush to such position and then to impart wiping movements thereto to register the engaged sheets with said gage.

43. In a machine of the class described, a sheet supporting table, a stationary sheet gage thereon, a sheet wiping member mounted for swinging movements into and out of sheet coacting position, and in the direction of registering movements of a sheet and means operable to control the swinging movements of said member and to impart sheet wiping movements thereto when in engagement with a sheet to register the sheet with said gage.

44. In a machine of the class described, a sheet supporting table, a sheet gage for said table, slide means over said table, a slide head carried by said means, a sheet wiping member carried by said head for sliding movements therewith and for raising and lowering movements relative thereto, and means operable to first act on said member to lower it into sheet engaging position with respect to said head and then to move the head and member together on said slide means to move a sheet with which said member is engaged into register with said gage.

45. In a machine of the class described, a sheet supporting table, a sheet gage for said table, a slide over said table, a head mounted for sliding movements on said slide, a brush carried by said head for movements therewith and for raising and lowering movements relative thereto, means for retarding the sliding movements of said head, and means automatically operable to lower said brush, to sheet wiping position and then to impart sheet wiping movements in unison to said head and brush to register an engaged sheet with said gage and afterward to return the head and brush to normal inoperative position.

46. In a machine of the class described, a table, a stationary sheet gage thereon, a member mounted for sheet registering movements in the surface of said table, a sheet engaging brush mounted over said member in normally spaced relation thereto and movable into sheet coacting engagement therewith and also adapted to have sheet registering movements with said member, and means periodically operable to move the brush into sheet coacting engagement with said member, then to move the brush and member to place the engaged sheet into register with said gage and afterward to return said member and brush to initial positions.

47. In a machine of the class described, a pair of sheet registering members relatively movable into and out of sheet coacting relation, a movable cam and separate mechanisms connecting said cam and members for imparting respective sheet registering movements in unison to said members.

48. In a machine of the class described, a pair of opposed sheet coacting members, one of said members being movable into and out of sheet coacting relation with the other member, a revoluble cam, and separate means connecting said cam and members for moving one into sheet coacting relation to the other member and for imparting reciprocatory movements to both members to communicate registering movements to an engaged sheet.

49. In a machine of the class described, upper and lower frames mounted for independent pivotal movements, a sheet registering member movably carried by each frame, and mechanism operable to impart predetermined sheet registering movements to said members and capable of permitting independent pivotal movements of the frames without disconnecting said means and members.

50. In a printing press, the combination with a sheet supporting table and front and side sheet gages therefor, of means operable to initially and finally act on a sheet fed to said gages to place it in register with the front gages, and means operable to act on a sheet intermediate the initial and final actions of said first means to place the sheet in register with the side gage.

51. In a printing press, the combination with front and side sheet gages, of means periodically operable to have wiping coaction with a sheet fed to said gages to place it in register with the side gage, and means periodically operable to act on a sheet both before and after the action of said first means thereon to register the sheet with the front gages.

52. In a printing press, the combination with front and side sheet gages, of means periodically operable to have opposed yielding engagement with a sheet fed to said gages and movable to place the engaged sheet in register with the side gage, and means operable to have opposed engagement with the front edge portion of a sheet both before and after the registering engagement of the sheet by said first means and to act on the sheet to place it in register with said front gage.

53. In a printing press, the combination with a cylinder, and the front and side gages for sheets fed to the cylinder, of means periodically operable to engage a sheet fed to said gages and move it into register with a side gage, a sheet registering element carried by said cylinder for forward wiping engagement with a sheet when in cylinder picking up position, and means operable to periodically coöperate with said element to act on a sheet to place it in register with the front gages.

54. In a printing press, the combination with a cylinder, and the front and side sheet gages, of means operable to periodically coact with sheets fed to the cylinder to place them in register with the side gage, a sheet wiping element carried by said cylinder, and means operable in conjunction with said element to impart intermittent front gage registering movements to a sheet both before and after the sheet is acted on by said registering means.

55. In a printing press, the combination

with a sheet supporting table, of a finger projecting from the forward end thereof and having its free end forked, and sheet registering means movable at one side of said finger and having wiping coaction with a sheet through the forked end portion of said finger.

56. In a printing press, the combination with a sheet supporting table, of a forked finger projecting from the forward end thereof, and coöperating revoluble sheet registering brushes having sheet coaction through the forked end of said finger.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

MICHAEL A. DROITCOUR.

Witnesses:
N. R. WILLIAMS,
M. F. WEGER.