

Sept. 4, 1928.

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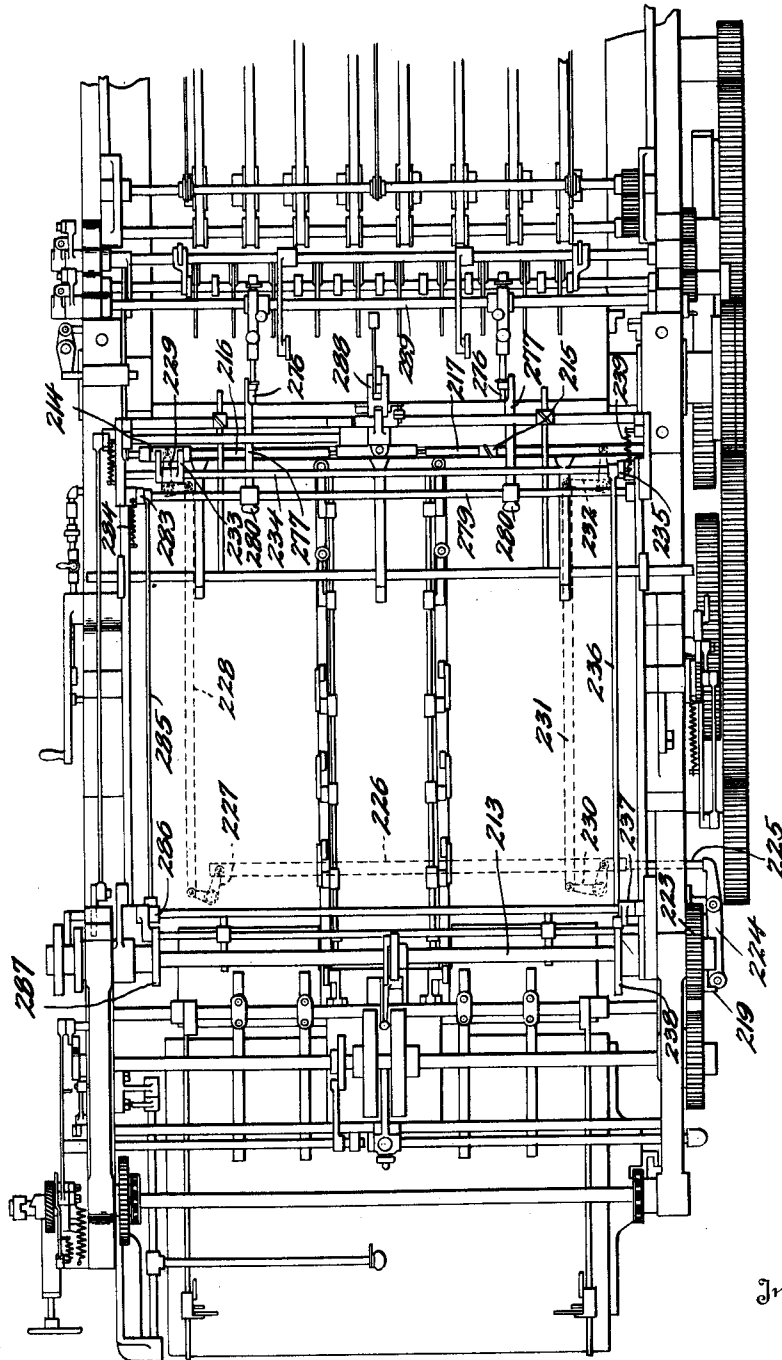
1,683,195

SHEET FEEDING MECHANISM

Original Filed Aug. 6, 1921

4 Sheets-Sheet 1

FIG. 1.



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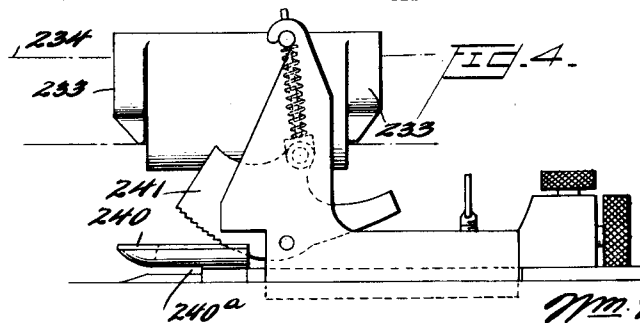
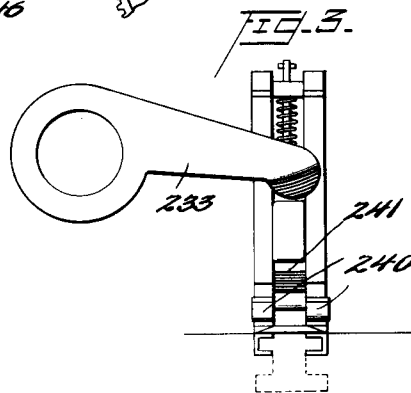
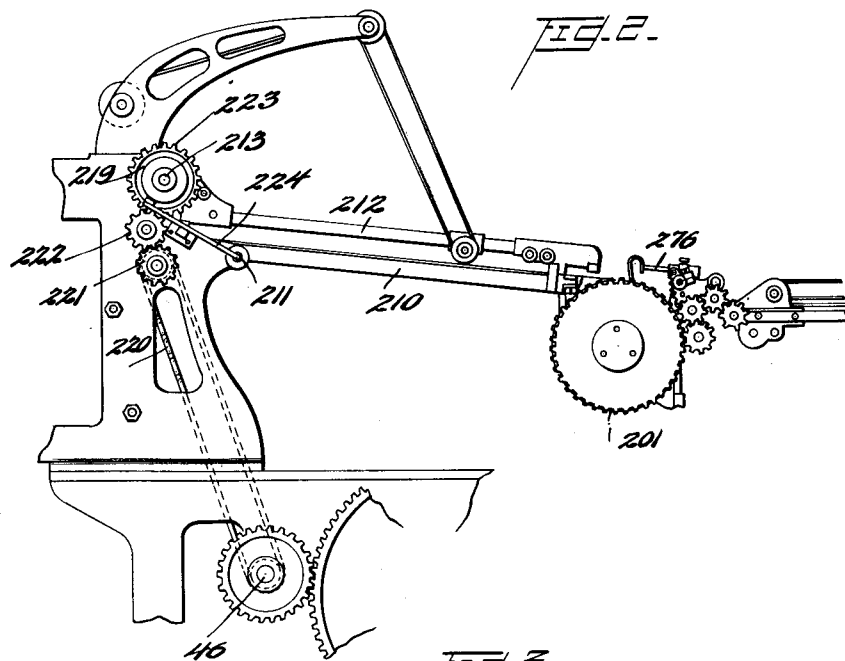
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4 Sheets-Sheet 2



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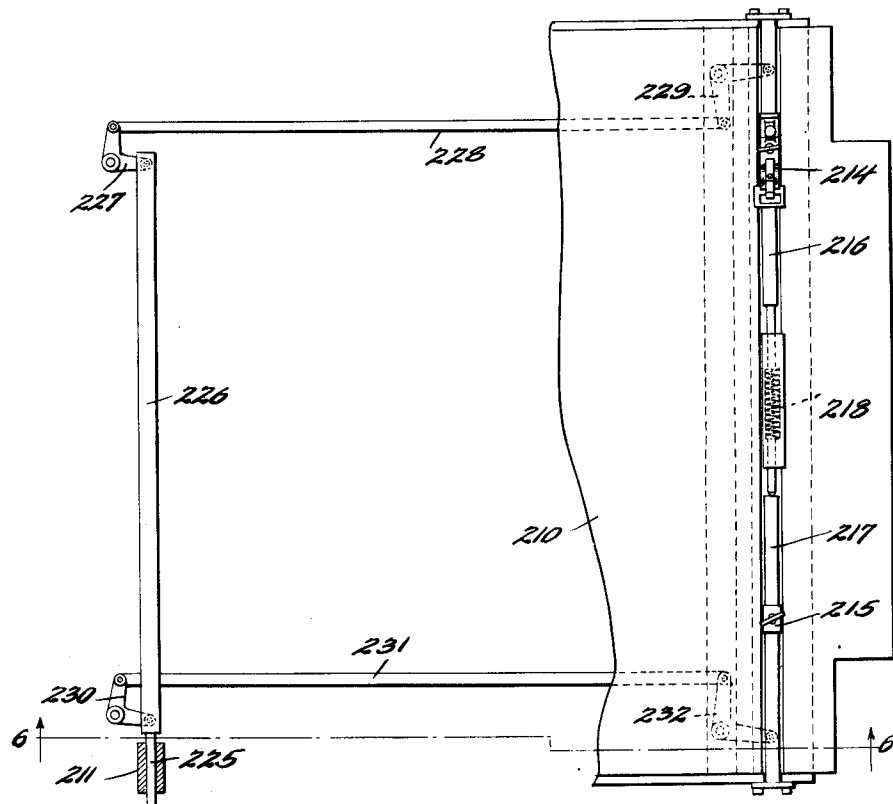
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SHEET FEEDING MECHANISM

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4 Sheets-Sheet 3

FIG. 5.



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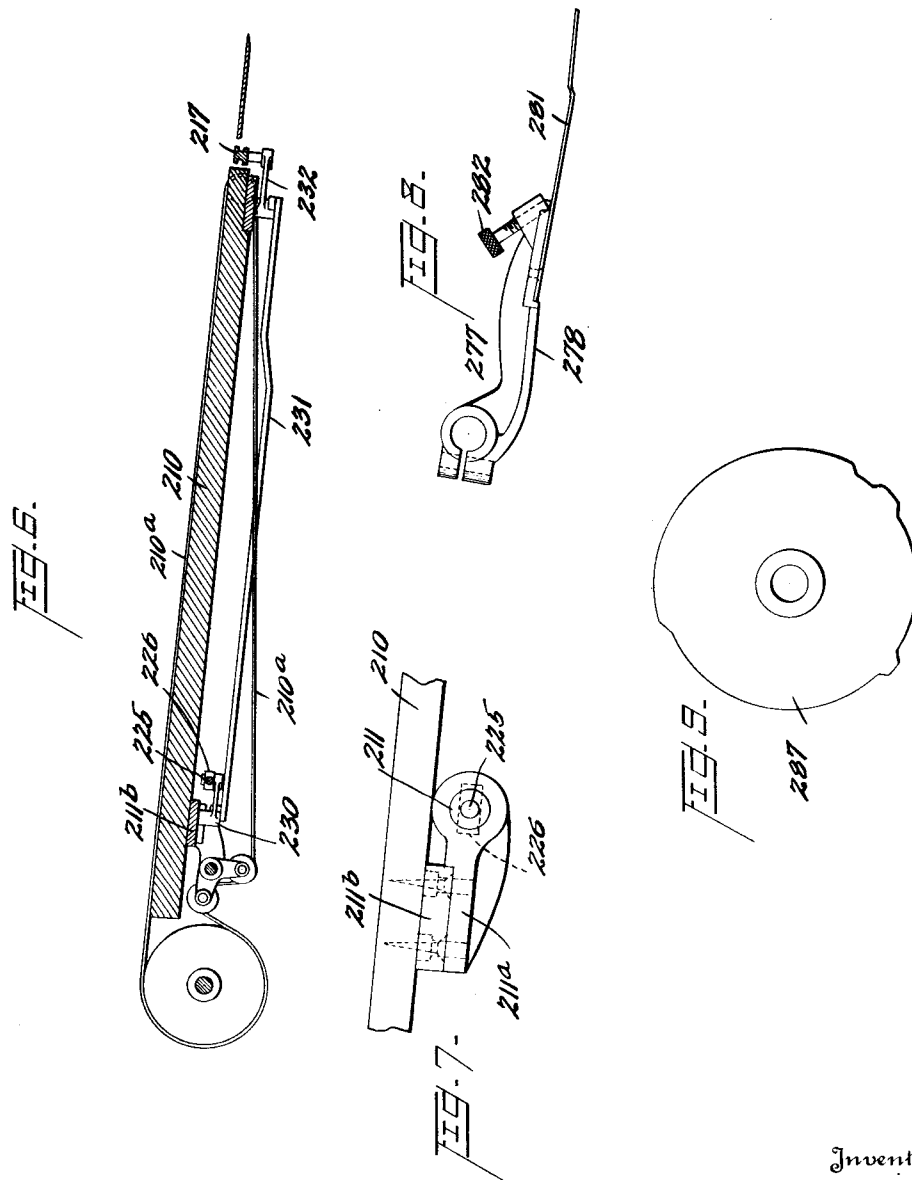
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SHEET FEEDING MECHANISM

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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SHEET-FEEDING MECHANISM.

Original application filed August 6, 1921, Serial No. 490 290, and in Great Britain July 27, 1922.
Divided and this application filed April 15, 1927. Serial No. 184,122.

The present invention relates to sheet feeding mechanism particularly for printing presses.

One of the features of the invention resides in the combination of a pivoted feed board part, a pivoted frame part, sheet advancing tapes on one of said parts, side register mechanism on the feed board, and means to actuate the side register which is not disconnected by raising said parts.

Another feature of the invention resides in the means for actuating the side register mechanism or side guides, and includes a member arranged coaxially with the pivots of the feed board so that the feed board may be raised without in any way affecting the mechanism for operating the side register.

Another feature consists of improved slow-down or lazy fingers and means for actuating the same constructed and arranged to slow down the sheet as it approaches the front guides, straighten the same, then perform another slow-down function to prevent rebound of the sheet from the front guides, to act as a lazy finger bearing on the sheet while the gripper fingers seize and withdraw the same and finally acting as strippers to prevent upward movement of the front edge of the sheet with the front guides.

Other objects and features of novelty will be apparent from the description taken in connection with the drawings, in which:

Fig. 1 is a top plan view of the press;

Fig. 2 is a side view of the same;

Figs. 3 and 4 are elevations illustrating the snap guide for giving the proper side register;

Fig. 5 is a partial plan view of the feed board illustrating the mechanism for operating the side register device;

Fig. 6 is a longitudinal sectional elevation of the feed board;

Fig. 7 is a detail;

Fig. 8 is a side elevation of a slow-down or lazy finger; and

Fig. 9 is an elevation of the lazy finger operating cam.

Referring to the drawings, and more particularly to Fig. 2, a portion of a press is shown, provided with a feed board 210 pivoted for raising movement about the pivots 211 carried by brackets 211^a (Fig. 7) secured to cross bar 211^b on the bottom of the feed

board. Above this feed board is a frame 212 mounted for raising movement about the axis of shaft 213.

As shown in Fig. 5, the side register mechanism includes a snap guide indicated in general by the reference numeral 214 and a side guide 215. The former is carried by a transversely movable bar 216 and the latter by a similar bar 217. These two bars are forced apart by means such as the spring 218. The guides are moved toward each other by a mechanism operated from a cam 219 (Figs. 1 and 2) carried by the transverse shaft 213. As shown in Fig. 2 this shaft is driven from shaft 46 in the base by means of the chain 220 and gears 221, 222 and 223, the latter being secured to shaft 213. The cam 219 acts on a lever 224 one end of which is in engagement with a pin 225 coaxial with the pivots of the feed board 210. This pin 225 abuts the end of a bar 226 also disposed coaxially with the feed board pivots. This bar is operatively connected with the bars 216 and 217 in any suitable manner. As shown, one end of the axial bar 226 is connected to an arm of the bell crank lever 227 and the other arm of said lever is connected by link 228 to one arm of another bell crank 229 which has its other arm connected to bar 216. In a similar manner the bars 226 and 217 are connected by means of the bell crank 230, link 231 and a second bell crank 232. As the bell cranks 227 and 230 are oppositely disposed with respect to each other, longitudinal movement of the bar 226 forces the bars 216 and 217 toward each other, the latter being moved apart by the spring 218. It will be observed, because of the axial pin 225, that the feed board may be elevated without disturbing the mechanism for actuating the side register.

The snap guide 214, shown more in detail in Figs. 3 and 4, is actuated to grip and thereafter free the sheet by the arms 233 carried by rock shaft 234 on the frame 212 (Fig. 5). This rock shaft is actuated by means of an arm 235 (Fig. 1) secured thereto, a rod 236, another arm 237 and cam 238 secured to the shaft 213. The cam actuates the arms 233 in one direction and a spring 239 in the other. It will be noted that the arms 233 are therefore actuated from the

cam 238 which is concentric with the pivots of said frame 212. Consequently said frame may be raised without in any way interfering with the mechanism for actuating arms

233. An improved feature of the snap guide construction is the provision of deflector 240 which is formed of two spaced parts between which the gripper 241 moves. The parts 240 cause the sheet to enter the throat 240^a and prevent the doubling over or folding back of the edge of the sheet. Without the members 240 often the sheet will double over at its edge and in this form be seized by the gripper 241, not only deforming and mutilating the sheet but also throwing it out of register. With the deflectors 240 this cannot happen.

The sheet is advanced to the cylinder 201 in any suitable way, as by the tapes 210^a on one of the pivoted parts, as the feed board. To slow down the sheet and otherwise manipulate it just before and after it strikes the front guides 276, slow down or lazy fingers 277 are provided, as shown in Fig. 1, the preferred construction of the same being illustrated in Fig. 8. As shown, the finger includes a bracket 278 secured to shaft 279 by a clamp screw 280 and this bracket carries a spring steel extension 281 which may be adjusted by means of screw 282. Referring to Fig. 1, the shaft 279 carries an arm 283 actuated in one direction by a spring 284 and in the other by mechanism including a link 285, at one end secured to said arm, and at the other end to an arm 286 and a cam 287 the outline of which is illustrated in Fig. 9, said cam being secured to shaft 213.

This cam 287 is constructed so that the slow-down or lazy fingers 277 are vibrated up and down three times in succession. The fingers first slow down the sheet and at the same time straighten the same. They remain down preferably until the sheet knocks out the sheet detector 288. Then the fingers are raised to permit the sheet to advance within about one quarter of an inch of the front guides 276. Thereupon the fingers are moved downwardly for a second slow-down operation and also to prevent rebound of the sheet when it strikes the front guides. Now the fingers rise to permit operation of the side guides and then again descend and remain there until the cylinder gripper fingers take the sheet.

During this last period the fingers act as lazy fingers, bearing on the sheet while the gripper fingers withdraw the same. The slow-down fingers 277 also act as strippers to prevent upward movement of the sheet with the front guides when they are elevated.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a sheet feeding mechanism, a side register device, a pivoted member carrying said register device and means to actuate said device including an element coaxial with the pivots of said member and movable in an axial direction.

2. In a sheet feeding mechanism, in combination, a sheet manipulating device, a pivoted member carrying said device, an element disposed coaxially with the pivots of said member and operatively connected to said device and means to reciprocate said element to actuate said device.

3. In a printing press, in combination, a pivoted feed board, a sheet manipulating device carried by said board, an element disposed coaxially of the pivots of said board, a lever connected to said element and device, and means to reciprocate said element to actuate said device.

4. In a printing press, in combination, a pivoted feed board, a snap guide carried by said board, an element disposed coaxially of the pivots of said board operatively connected to said guide, and means to reciprocate said element to reciprocate said guide.

5. In a sheet feeding mechanism, in combination, a pair of spaced guides, a pivoted member carrying said guides and means to reciprocate said guides transversely of the path of the sheets including an element coaxial of the pivots of said member, and means to reciprocate said member.

6. In a sheet feeding mechanism, in combination, a pivoted feed board, a side register device carried by said board, and means to actuate said device including an axially operated element coaxial with the pivots of said board, whereby the board may be raised without disturbing said actuating means.

7. In mechanism of the character described, in combination, a side register device, a pivoted member carrying said device, a bar disposed coaxially of the pivots of said member, a bell crank lever having one arm connected to said bar, a second bell crank lever having an arm connected to said device, a link connecting the other arms of said levers and means to reciprocate said bar.

8. In mechanism of the character described, in combination, a pair of side guides, a pivoted member carrying said guides, a bar disposed coaxially of the pivots of said member, and like transmission devices connecting said bar and guides, each comprising a bell crank lever having one arm connected to said bar, a second bell crank lever having an arm connected to a guide, and a link connecting the other arms.

9. In a printing press, in combination, means to feed a sheet to the impression device, a finger adjacent said device and means to actuate said finger three times in rapid succession into contact with said sheet.

10. In a printing press, in combination, means to feed a sheet to the impression device, a finger adjacent said device and means to actuate said finger a plurality of times in rapid succession into contact with said sheet.

11. In a printing press, in combination, means to feed a sheet to the impression device, a finger adjacent said device and means including a cam to actuate said finger three times in rapid succession into contact with said sheet.

12. In a printing press, in combination, means to feed a sheet to the impression device, a finger adjacent said device and means including a cam to actuate said finger a plurality of times in rapid succession into contact with said sheet.

13. In a sheet feeding mechanism, in combination, means to feed a sheet and thereafter stop the same including a rock shaft, a slow down finger carried by said shaft and means to vibrate said shaft three times in rapid succession to cause said finger to contact with the top surface of the sheet.

14. In a sheet feeding mechanism, in combination, means to feed a sheet to a definite position including a slow down device and means to actuate said device twice in rapid succession into contact with the surface of said sheet as it approaches said position and once again after it arrives at said position.

15. In a printing press, in combination, a feed board, an impression cylinder, means to advance a sheet over said board to cylinder pick up position including a combined slow down, straightening and stripper device adjacent said cylinder and means to actuate said device three times in rapid succession into contact with the surface of said sheet adjacent the forward edge thereof.

16. In a sheet feeding mechanism, in combination, a feed board, a frame over said board, said frame and board being mounted to be moved to give access to the space below the board, and having means to advance a sheet to a definite position on the board, said means including a slow down device, and a side register device on said board, and means to actuate said devices operative in all positions of said board and frame.

17. In a sheet feeding mechanism, in combination, a feed board, a frame over said board, said frame and board being mounted to be moved to give access to the space below the board, and having means to advance a sheet to a definite position on the board, including a side register on said board, said means including a slow down device carried by said frame and operative in all positions thereof.

18. In a sheet feeding mechanism, in combination, a feed board, a frame over said board mounted to be moved away therefrom, means to feed a sheet to a definite po-

sition on said board including a slow down device carried by said frame, and a side register device on said board, and means to actuate said devices operative in all adjustments of said frame.

19. In a sheet feeding mechanism in combination, a feed board, a frame over said board pivoted to be moved away therefrom, means to feed a sheet to a definite position on said board including a slow down device carried by said frame, and a side register device on said board, and means to actuate said devices operative in all adjustments of said frame.

20. In a sheet feeding mechanism in combination, a feed board, a frame over said board pivoted to be moved away therefrom, means to feed a sheet to a definite position on said board including a slow down device carried by said frame, and a side register device on said board, and means to actuate said devices including cams coaxial with the pivots of said frame.

21. In a sheet feeding mechanism in combination, a feed board, a frame over said board pivoted to be moved away therefrom, means to feed a sheet to a definite position on said board including a slow down device carried by said frame, and a side register device on said board, and means to actuate said devices including transmission elements coaxial with the pivots of said frame.

22. In a sheet feeding mechanism in combination, a feed board, a frame pivoted to be swung away from said board, means to advance a sheet to a definite position on said board including a rock shaft carried by said frame, a finger secured to said shaft and means to vibrate said shaft a plurality of times while the sheet advances to and arrives at said position, said vibrating means including an element coaxial with the pivots of said frame.

23. In a sheet feeding mechanism in combination, a feed board, a frame pivoted to be swung away from said board, means to advance a sheet to a definite position on said board including a rock shaft carried by said frame, a finger secured to said shaft and means to vibrate said shaft a plurality of times while the sheet advances to and arrives at said position, said vibrating means including a cam coaxial with the pivots of said frame.

24. In a printing press, in combination, a feed board, an impression cylinder, means to advance a sheet on said board to cylinder pick up position, a sheet detector, a front guide, a side guide, a device adapted to contact with the surface of the sheet adjacent the forward edge thereof, means to actuate said device into contact with the sheet until it hits the detector, to slow it down, then raise the device to permit the sheet to approach close to the front guide, then move

into contact again with the sheet for a second slow down effect, then raise the device for the operation of the side guide, then again move the device into contact with the sheet until the gripper fingers take the same.

25. In a sheet feeding mechanism for a printing press having an impression cylinder, a pivoted feed board part, a pivoted frame part, sheet feeding conveyor tapes on one of said parts, side register mechanism on said feed board part adjacent to the cylinder, and means to actuate said tapes and side register which is undisturbed by the raising of said parts.

26. In a sheet feeding mechanism for a machine having a cylinder, a pivoted feed board part, a pivoted conveyor part resting at its forward end on said feed board, means to advance sheets to cylinder pick up posi-

tion on the feed board including tapes carried by one of said parts, a side register device on said board adjacent to the cylinder, and means to actuate said side register which is undisturbed by raising said parts.

27. In a sheet feeding mechanism for a printing press having an impression cylinder, a feed board part pivoted at its portion remote from said cylinder, a frame part pivoted at its end and having its pivot more remote from the cylinder than said feed board pivot, means to advance sheets to cylinder pick up position including tapes on one of said parts, a side register device on said feed board adjacent the cylinder, and means to actuate said side register and tapes which is undisturbed by raising said parts.

In testimony whereof I hereunto affix my signature.

WILLIAM M. KELLY.