

Oct. 28, 1941.

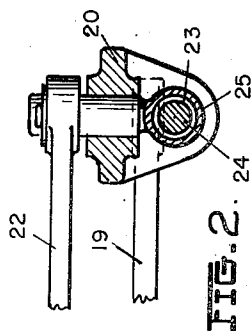
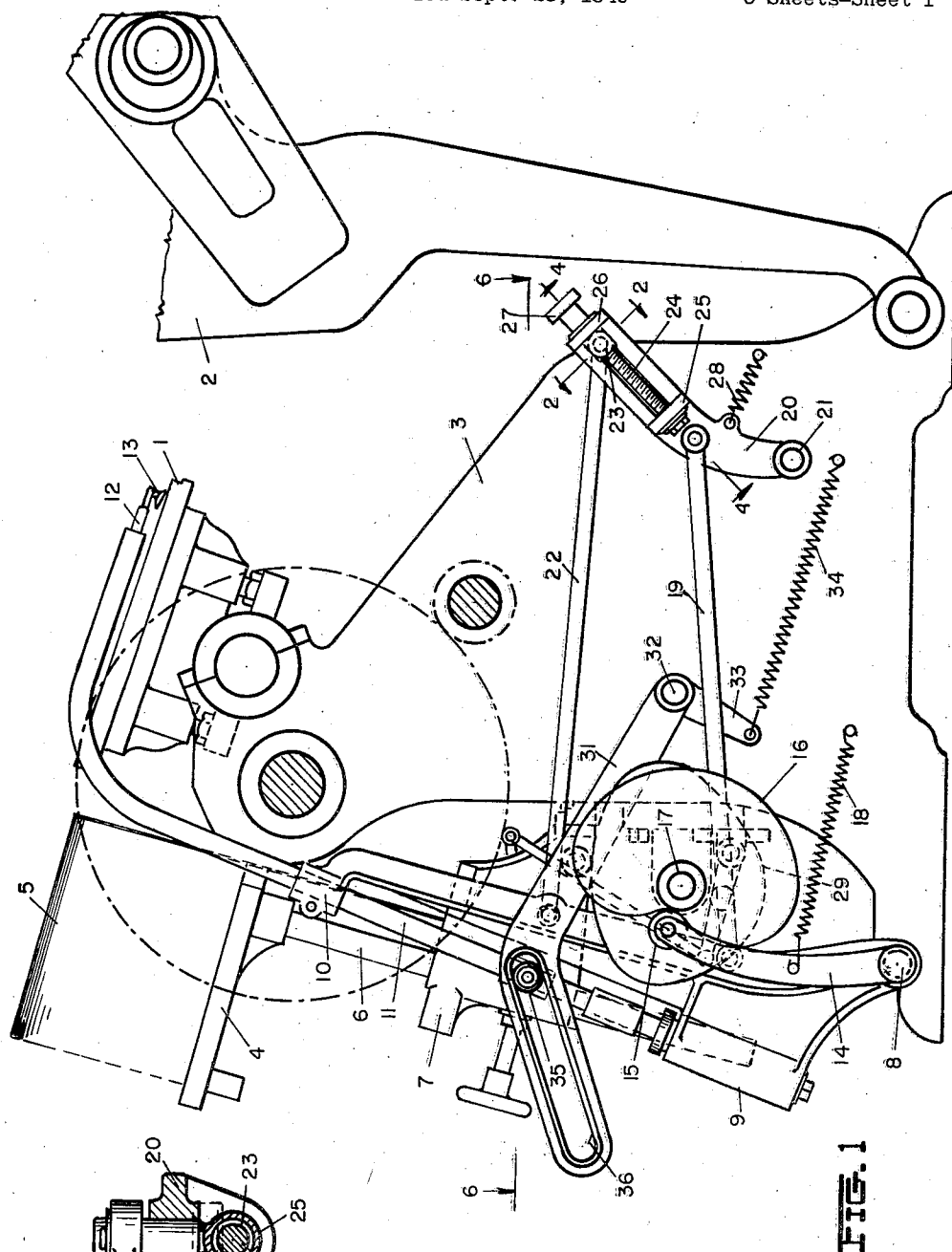
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2,260,684

SHEET FEEDING MECHANISM FOR PRINTING PRESSES

Filed Sept. 23, 1940

5 Sheets-Sheet 1



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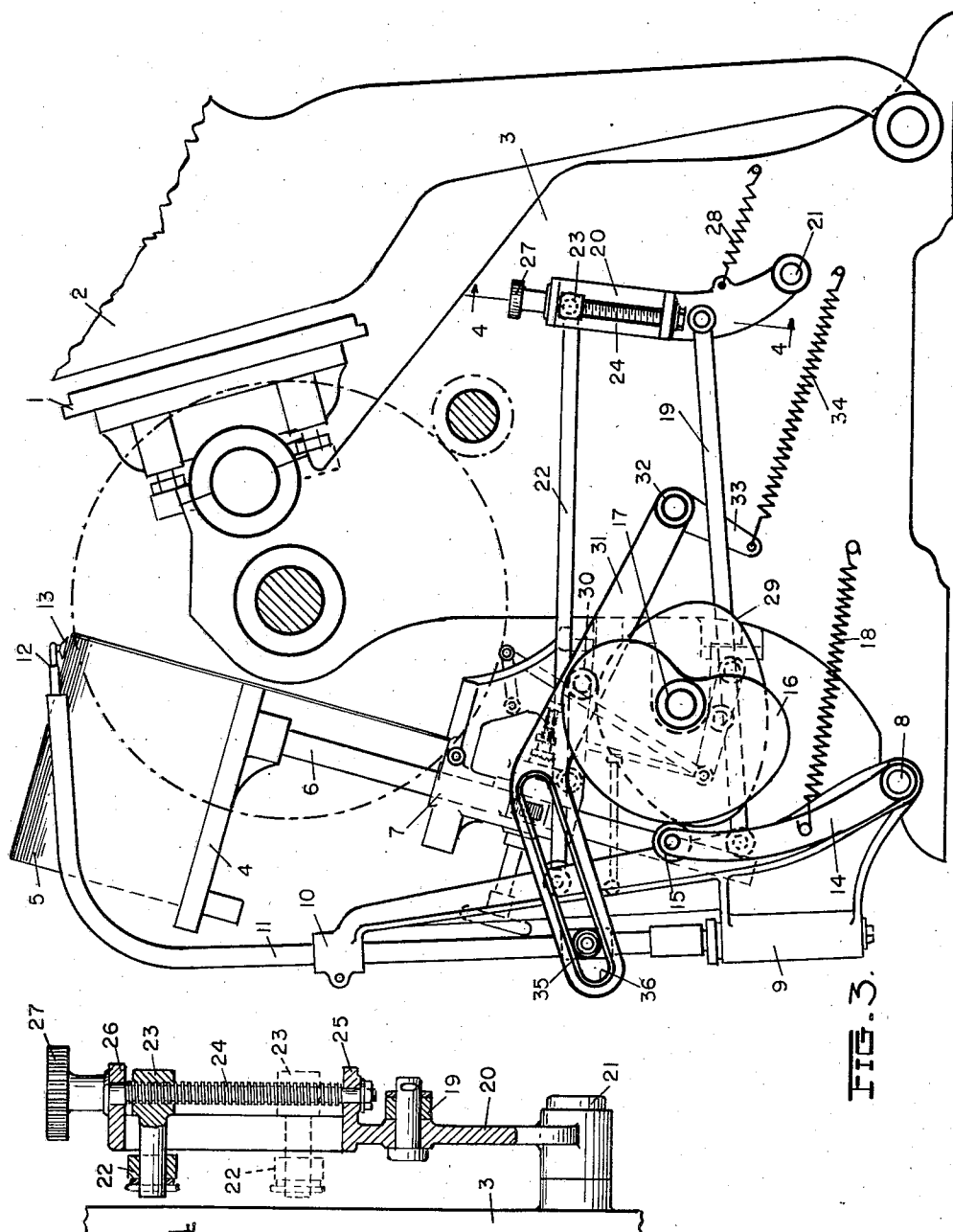
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SHEET FEEDING MECHANISM FOR PRINTING PRESSES

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5 Sheets-Sheet 2



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SHEET FEEDING MECHANISM FOR PRINTING PRESSES

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5 Sheets-Sheet 3

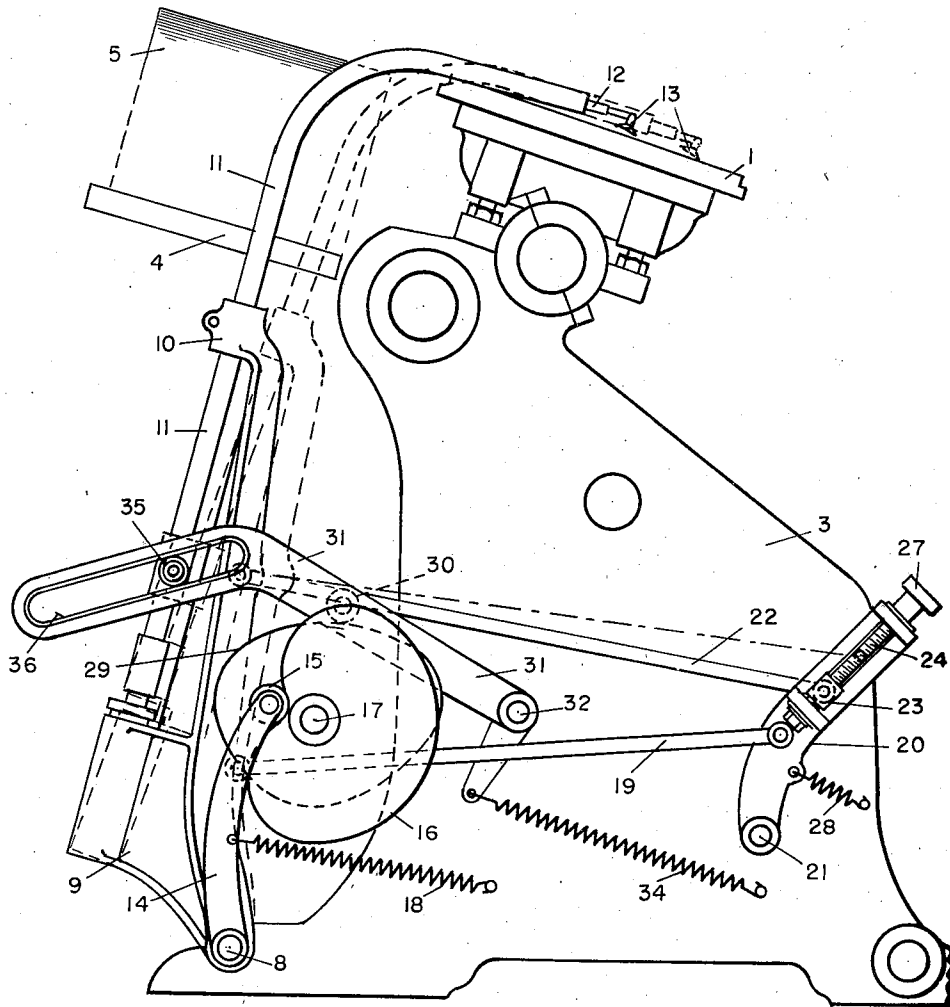


FIG. 5

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SHEET FEEDING MECHANISM FOR PRINTING PRESSES

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5 Sheets-Sheet 4

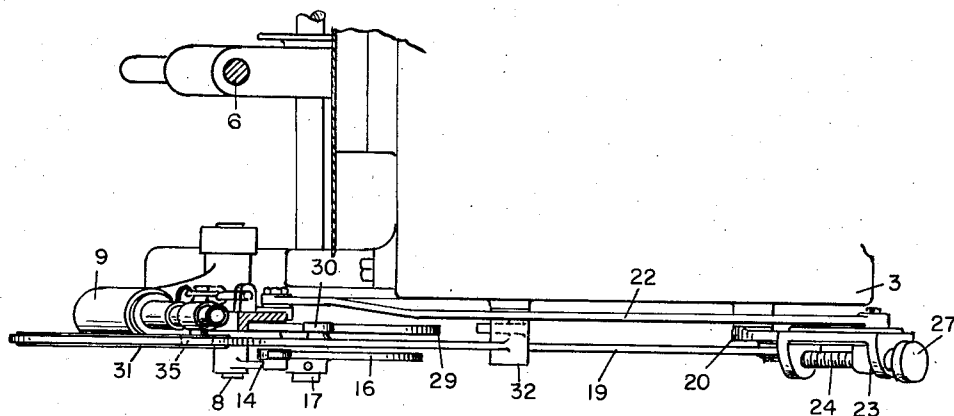


FIG. 6.

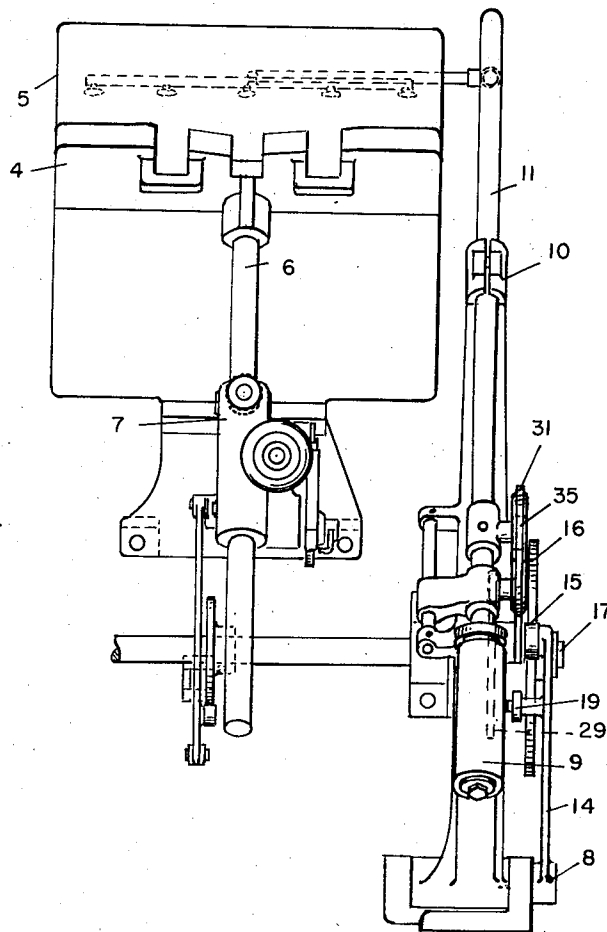


FIG. 7.

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SHEET FEEDING MECHANISM FOR PRINTING PRESSES

Filed Sept. 23, 1940

5 Sheets-Sheet 5

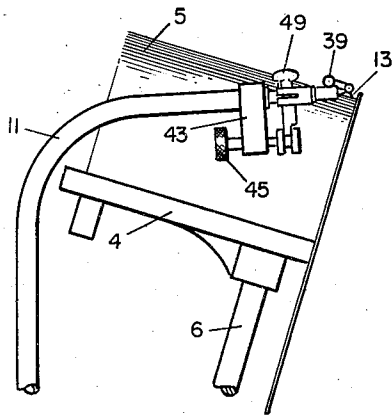


FIG. 8

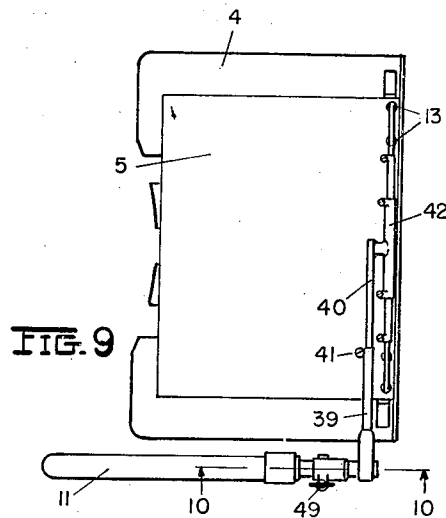


FIG. 9

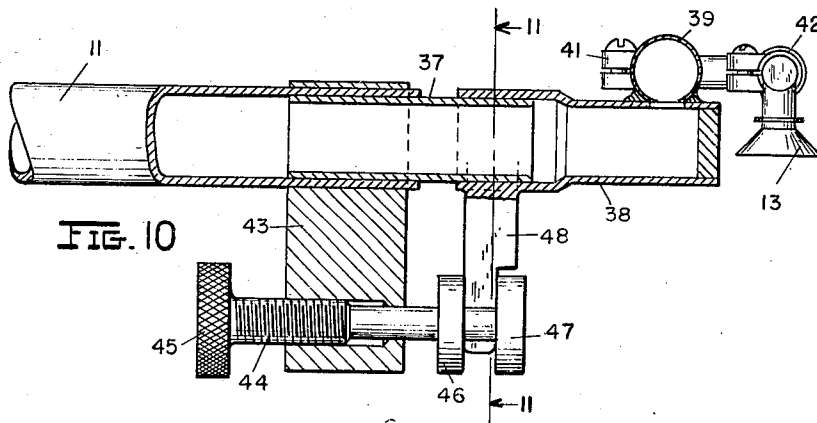


FIG. 10

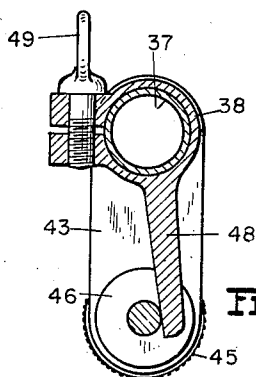


FIG. 11

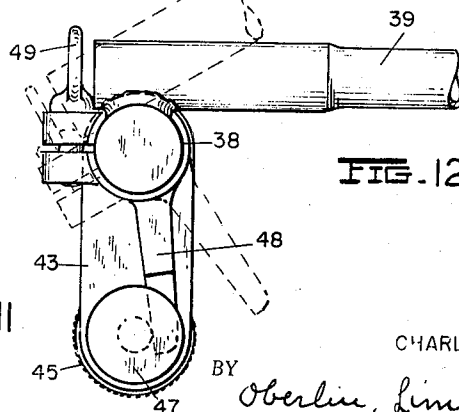


FIG. 12

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UNITED STATES PATENT OFFICE

2,260,684

SHEET FEEDING MECHANISM FOR PRINTING PRESSES

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Application September 23, 1940, Serial No. 357,882

14 Claims. (Cl. 101—287)

This invention relates, as indicated, to sheet feeding mechanism for printing presses, and more particularly platen presses of the well-known Gordon type. The invention is particularly concerned with mechanism which is adjustable whereby sheets may be fed to various positions on the platen of the press.

Various mechanisms have been known in the art whereby sheets of different sizes may be transferred from a feed table to a platen at different points on such platen and one method is described and illustrated in Root Patent No. 2,081,958 wherein an adjustable feed table is employed in order that its position may be correlated to the different adjustments of the feeder assembly. It has been found desirable, however, to employ a feed table which need not be so adjusted in order to reduce the complexity of the mechanism required. It has also been found desirable to provide sheet feeding means which will be positive in operation no matter to what point on the platen the sheet is to be fed and which will always pick the sheet from the feed table at substantially the same point irrespective of the point on the platen to which the sheet is to be fed.

It is, therefore, a primary object of this invention to provide sheet feeding mechanism wherein sheet picker means are adapted to travel from a fixed point above the feed table to an optionally variable point above the platen.

It is a further object to provide such means which will be positive in operation and will deposit the sheet in substantially the same relationship to the platen surface no matter to what point on the platen the sheet may be transported.

Another object of this invention is to provide such mechanism which may be readily adjusted to provide the desired stroke or length of path of movement of the feeder assembly.

Still another object is to provide such mechanism which will occupy a relatively small space laterally of the press and hence will offer a minimum of interference to ready access to the feed table, platen, etc.

Other objects of this invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means

constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

5 Fig. 1 is a side elevational view of a platen printing press embodying my new invention;

Fig. 2 is a sectional view along the line 2—2 on Fig. 1;

10 Fig. 3 is a view similar to Fig. 1 but showing the press in impression position;

Fig. 4 is a sectional view taken along the line 4—4 on Figs. 1 and 3;

15 Fig. 5 is a side elevational view similar to Fig. 1 but illustrating the manner in which the sheet feeding mechanism may be adjusted to vary the stroke of the sheet picker means;

Fig. 6 is a fragmentary top plan view, partly in cross section, of the sheet feeder regulator means, taken along the line 6—6 on Fig. 1;

20 Fig. 7 is a rear elevational view of the feed table and sheet feeding mechanism;

Fig. 8 is a side elevational view of the feed table showing a preferred form of feeder bar mounting means;

25 Fig. 9 is a top view of the stack and feeder bar;

Fig. 10 is an enlarged view, taken along line 10—10 on Fig. 9, of the end of the feeder bar carrier showing the manner in which the feeder

30 or picker bar is mounted thereon;

Fig. 11 is a sectional view taken on the line 11—11 on Fig. 10; and

Fig. 12 is a view of such mounting means taken axially of the end of the feeder bar carrier.

35 Referring now more particularly to the drawings, the press illustrated is of the conventional platen or Gordon type and includes a platen 1 on which the sheet to be printed is positioned, and a bed 2 which supports the chase and form (not shown). Both the platen and the bed are pivotally mounted in the main frame 3 of the press and are adapted to be conjointly oscillated in a well-known manner to cause the sheet to be printed. A feed table 4, adapted to carry a stack of sheets 5, is mounted on an inclined shaft 45 6 axially movable in its supporting bracket 7 which is fixedly attached to the frame 3 of the press. Means which need not here be described are provided for automatically elevating such table as sheets are removed from the top of the stack.

Pivotally mounted on shaft 8, journaled in the frame of the press, is an oscillatable member 9 having a vertical extension 10 in which is reciprocally mounted picker carrier means 11 com-

prising a tube angularly disposed in its upper portion and carrying at its end a tubular feeder bar 12 provided with sucker tips 13. Means (not shown) of the conventional type may be provided for causing intermittent suction within tube 11. Also journaled on shaft 8 is a lever arm 14 carrying a cam roller 15 at its end, such roller being adapted to engage the periphery of a cam 16 mounted on drive shaft 17. A spring 18 serves to hold said roller in engagement with said cam. A link 19 serves to connect said lever arm 14 with another lever 20 pivotally mounted on stub shaft 21 on the frame 3 of the press. A further link 22 connects said lever 20 and the extension 10 of oscillatable member 9 so that as cam 16 rotates, causing lever arm 14 to rock, such rocking action will be transmitted through link 19, lever 20 and link 22 to oscillate member 9, feeder bar carrier 11, and sucker tips 13. The degree of oscillation of said member 9 may be regulated by adjusting the means whereby link 22 is attached to lever 20. Such means comprises a threaded block 23 to which such link is pivotally attached, said block being mounted on a screw 24 supported by flanges 25 and 26 on lever 20. Said screw is rotatable by means of a knurled knob 27 whereby block 23 may be caused to travel along such screw. This of course varies the distance of the point of pivotal attachment of link 22 from the center of rotation of lever 20 and since lever 20 is curved accordingly varies the degree of oscillation of member 9. When block 23 is in the position illustrated in Fig. 1, the degree of oscillation of member 9, and therefore the stroke of feeder bar 12, will be at its maximum, while when said block is positioned as illustrated in Fig. 5, such stroke will be at its minimum. A spring 28 is provided to hold lever 20 under tension and assist in maintaining cam roller 15 of lever arm 14 in close contact with cam 16.

To reciprocate feeder bar carrier 11 in its supporting member 9 and extension 10 thereof, a second cam 29 is provided, also mounted on drive shaft 17. Such cam engages a cam roller 30 carried by a slotted lever 31 which is pivotally mounted on a stub shaft 32 on the main frame of the press. An angular extension 33 of said lever is engaged by a spring 34 which is effective to maintain said cam roller 30 in close engagement with the periphery of cam 29. A cam roller 35 fixedly mounted on tubular member 11, is adapted to fit within slot 36 in lever 31 and, as such lever is rocked about its pivot 32 by action of cam 29, thereby cause said tubular member to be axially reciprocated. Of course since member 9 is being simultaneously oscillated, cam roller 35 will travel back and forth within said slot 36.

If it were necessary for the sucker tips 13 to always contact the stack on the feed table at exactly the same point, clearly a form of arcuate slide would be necessary instead of the straight screw means 24 whereby the position of block 23 is adjusted. Such arc would be about a center defined by the point at which link member 22 is pivotally attached to extension 10 of member 9. However, it has been found that the adjustment of such block, employing the screw means illustrated, causes such slight variation in the point of contact of the sucker tips on the stack that it is not in the least necessary to employ the more elaborate arcuate adjusting means. In other words, the sucker tips 13 will always return to substantially the same predetermined point of rest above the feed table whether block 23 is in

the Fig. 1 position or the Fig. 5 position so that the tips always seize the sheets on the stack adjacent their forward edges no matter to what point on the platen such sheets are to be fed. Since lever 20 is curved away from the feed bar carrier 11, however, when the adjustment is as illustrated in Fig. 1 the sucker tips will be caused to travel considerably further across the platen than when the adjustment illustrated in solid line in Fig. 5, for example, is employed.

It is, of course, readily apparent that the adjusting means may be located elsewhere in the mechanism, as at the point where link 22 is pivotally attached to extension 10, and all such equivalents are within the scope of the invention.

Clearly, since the sucker tips would travel in an arcuate path about the pivotal point of shaft 8 if there were no axial reciprocation of feeder bar carrier 11, it is necessary to so regulate the reciprocation of such carrier that the sucker tips will bring the sheet to within substantially the same vertical distance from the surface of the platen no matter to what point on the platen the stroke of the feeding mechanism may carry such tips. This is obtained by disposing slot 36 in lever 31 at the proper inclination so that when the degree of oscillation of member 9 is varied by adjustment of the position of block 23 the degree of axial reciprocation of feeder bar carrier 11 will likewise be varied so that the sucker tips will be in proper relationship to the platen at the conclusion of the stroke. Thus, slot 36 is downwardly inclined so that feeder bar carrier 11 will not be axially reciprocated in the Fig. 5 position to the degree that it is in the Fig. 1 position, the lessened reciprocation compensating for the greater elevation of the sucker tips on their pivotal arc about shaft 8 in the Fig. 5 position as contrasted to the Fig. 1 position. It will, therefore, be seen that means have been provided by which the sheet picker means may be oscillated between predetermined points of rest respectively above the surfaces of the feed table and the platen and whereby the degree of such oscillation may be varied without substantially shifting the point of rest.

Referring now to Figs. 8 to 12, it has been found to be very desirable to be able to adjust the position of the sucker tips relative to the forward edge of the sheet as it is picked from the stack, since "onion skin" paper, for example, must be picked up very closely adjacent the forward edge to obviate buckling and consequent difficulty of registration on the platen, while heavy sheets, such as cardboard, should be picked at some little distance from their forward edges. For this purpose means have been provided at the extremity of feeder bar carrier 11 for so adjustably mounting the feeder bar. Such means comprise a short length of tubing 37 fitted within the end of the tubular feeder bar carrier 11 on the end of which tubing is pivotally and slidably mounted a closed tube 38 which fits the end sufficiently closely to form an air-tight seal. Joined to such closed tube and normal thereto is another tube 39 having a slidable extension 40 the position of which may be fixed by means of a clamp 41. Said extension 40 carries the true feeder bar 42 which is likewise laterally extensible and is provided with the sucker tips 13.

The means for adjusting the position of such feeder bar in relation to the forward edge of the sheets of the stack comprises a bracket 43 carrying a screw 44 having a knurled knob 45 at one extremity. The other extremity carries two spaced cylindrical members 46 and 47. A depending finger 48 is provided on closed tube 38 adapted to fit in the space between such aforesaid cylindrical members and is so disposed that in such position the feeder bar will be maintained parallel to the surface of the stack.

The position of the sucker tips relative to the forward edge of the stack may now be easily and precisely regulated by manipulation of screw 44 while the feeder bar may be swung out of the way when free access is desired to the feed table for any purpose, the end portion of tube 38 being slotted and provided with a clamping screw 49 for ensuring a close frictional contact and airtight seal with tube 37. Should the feeder bar be so raised and unintentionally displaced relatively to the forward edge of the stack, this becomes at once evident when it is again lowered since finger 48 will engage one of the cylindrical members 46 or 47 and cause the feeder bar to remain angularly elevated in a manner sufficiently obtrusive to call the operator's attention thereto. It will, therefore, be seen that means have been provided not only for the precise regulation of the positioning of the sucker tips but also for the prevention of any damage which might otherwise be occasioned by the negligence of the operator.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In platen presses and the like, sheet feeding means comprising sheet picker means, picker carrier means, means for reciprocating said carrier means, means for oscillating said carrier means, means for varying the degree of oscillation of said carrier means, and means responsive to the degree of oscillation operative to determine the degree of reciprocation.

2. In platen presses and the like, sheet feeding means comprising sheet picker means, an oscillatable member, picker carrier means reciprocably mounted in said oscillatable member, cam means for reciprocating said carrier means, lever means, cam means for rocking said lever means, link means connecting said lever means and said oscillatable member, and means for varying the point of attachment of said link means on said lever means whereby the degree of oscillation of said oscillatable member may be varied.

3. In platen presses and the like, sheet feeding means comprising sheet picker means, an oscillatable member, picker carrier means reciprocably mounted in said oscillatable member, cam means for reciprocating said carrier means to a degree determined by the degree of oscillation of said oscillatable member, lever means, cam means for rocking said lever means, link means connecting said lever means and said oscillatable member, and means for adjusting said link means to vary the degree of oscillation of said oscillatable member.

4. In platen presses and the like, sheet feeding means comprising sheet picker means, means for oscillating said picker means between a predetermined fixed point and a selectively variable point,

and means for reciprocating said picker means, and cam means operative to regulate the degree of reciprocation in proportion to the degree of oscillation.

5. In platen presses and the like, sheet feeding means comprising sheet picker means, means for oscillating said picker means between a predetermined fixed point and a selectively variable point; said oscillating means comprising cam means, lever means adapted to be rocked by said cam means, link means connecting said lever means and said picker means, the point of attachment of said link means on said lever means being adjustable to vary the oscillation of said picker means in one direction only; means for reciprocating said picker means, and cam means operative to regulate the degree of reciprocation in proportion to the degree of oscillation.

6. In platen presses and the like, sheet feeding means comprising in combination sheet picker means; means for oscillating said picker means between a predetermined substantially fixed point and a selectively variable point comprising angular lever means, cam means operative to rock said lever means, link means connecting said lever means and said picker means, and means for varying the point of attachment of said link means along said lever means; and means for reciprocating said picker means comprising an inclined cam adapted to slidably support said picker means, and means for reciprocating said inclined cam, whereby the degree of reciprocation of such picker means is determined by the degree of oscillation thereof, such oscillation being effective to determine the position of support of said picker means on said inclined cam.

7. In platen presses and the like, sheet feeding means comprising in combination sheet picker means; means for oscillating said picker means between a predetermined substantially fixed point and a selectively variable point comprising angular levers means, cam means operative to rock said lever means, link means connecting said lever means and said picker means, and means for varying the point of attachment along said lever means; and means for reciprocating said picker means comprising a cam follower thereon, a lever having an inclined cam-way adapted to slidably engage said cam follower and thereby support said picker means, and means for rocking said last-named lever whereby said picker means may be reciprocated, the degree of such reciprocation being determined by the degree of oscillation, such oscillation being effective to determine the position of said cam-follower on said inclined cam-way.

8. Sheet picker means for platen presses and the like comprising a picker bar carrier, a picker bar pivotally and slidably mounted thereon, and screw means for slidably adjusting the position of said picker bar relatively to said picker bar carrier.

9. Sheet picker means for platen presses and the like comprising a picker bar carrier, a picker bar pivotally and slidably mounted thereon, and means operative to prevent pivotal return of said feeder bar to operative position when said feeder bar is not properly slidably positioned in relation to said feeder bar carrier.

10. Sheet picker means for platen presses and the like comprising a picker bar carrier, a picker bar pivotally and slidably mounted thereon, a finger connected with said picker bar, and screw means carried by said picker bar carrier and operative to engage said finger to slidably adjust

said picker bar relative to said picker bar carrier.

11. Sheet picker means for platen presses and the like comprising a picker bar carrier, a picker bar pivotally and slidably mounted thereon, a finger connected with said picker bar, screw means carried by said picker bar carrier and operative to engage said finger to slidably adjust said picker bar relative to said picker bar carrier, and means carried by said screw effective to engage said finger and prevent pivotal return of said picker bar to operative position when said picker bar is not properly slidably positioned in relation to said picker bar carrier.

12. Sheet picker means for platen presses and the like comprising a picker bar carrier, a picker bar pivotally and slidably mounted thereon, a bracket on said picker bar carrier, a finger connected with said picker bar, screw means carried by said bracket, and spaced cylindrical members positioned at one end of said screw means and adapted to engage said finger therebetween whereby said picker bar may be slidably adjusted.

13. In a platen press, the combination with a feed table and platen of sheet feeding mechanism for transferring sheets from such table to the platen comprising sheet picker means, means operative to oscillate said picker means between predetermined points of rest respectively above such feed table and platen, means operative to recip-

rocate said sheet picker means during such oscillation, means for varying the degree of such oscillation to vary the point of rest above such platen without varying the point of rest above such feed table, and means automatically operative to vary the degree of reciprocation of the sheet picker means as the degree of oscillation is varied to maintain the point of rest above the platen in substantially the same vertical relationship thereto.

14. In platen presses and the like, sheet feeding means comprising sheet picker means, means for oscillating said picker means between a fixed point and a selectively variable point; said oscillating means comprising lever means, cam means for rocking said lever means, link means connecting said lever means and said picker means, and means for varying the point of attachment of said link means along said lever means; and means for reciprocating said picker means comprising a lever, cam means for rocking said lever, a cam face on said lever engaging said picker means and operative to reciprocate said picker means as said lever is rocked, said cam face being disposed to reciprocate said picker means at such variable point to a degree proportionate to the degree of oscillation of said picker means between such fixed point and such variable point.

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