

M. A. DROITCOUR.  
SHEET ADVANCING MECHANISM.  
APPLICATION FILED MAR. 9, 1918.

1,332,718.

Patented Mar. 2, 1920.

4 SHEETS—SHEET 1,

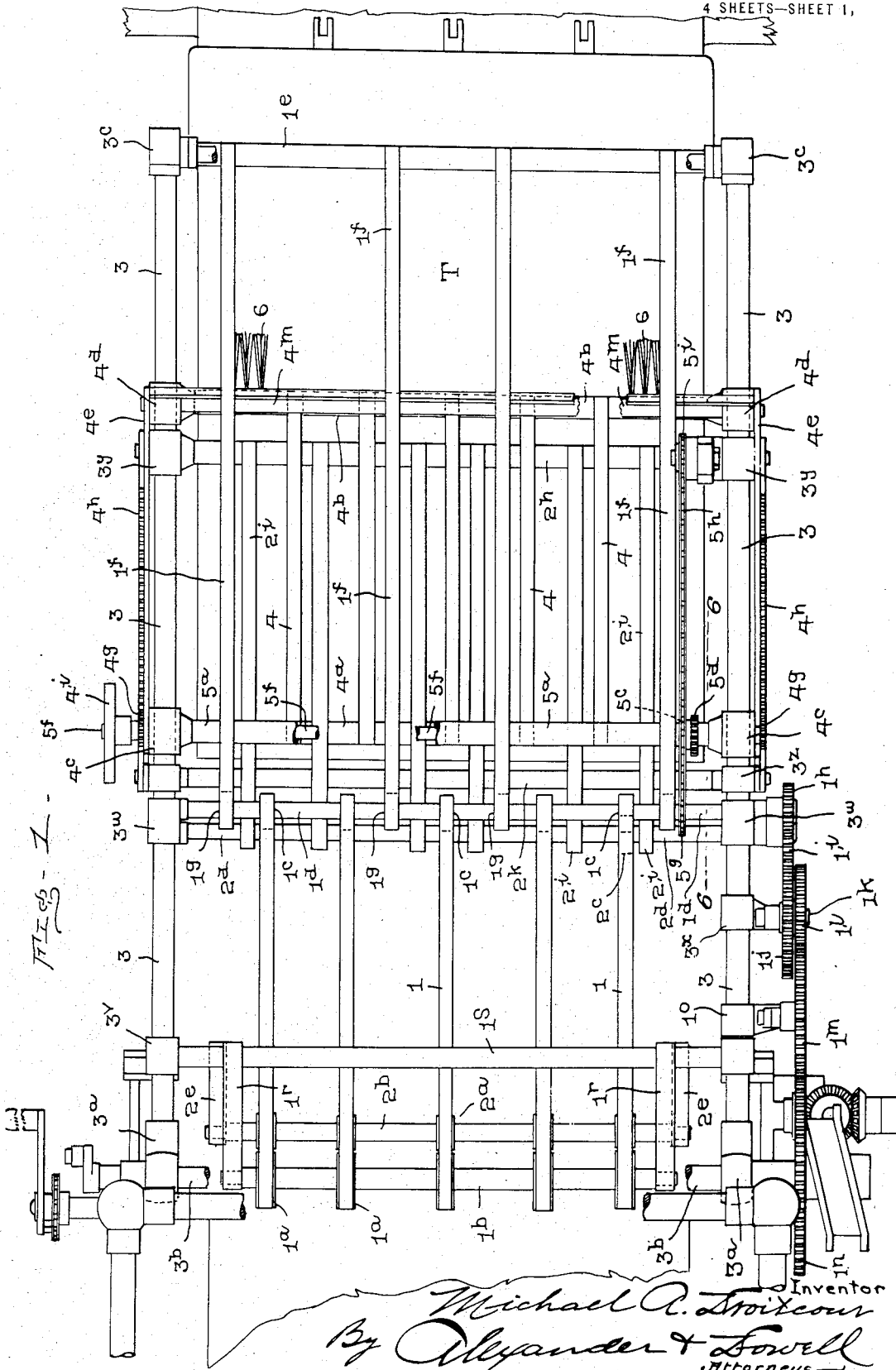


Fig. 1

Michael A. Droitcour  
By Alexander & Fowell  
Attorneys

M. A. DROITCOUR.  
 SHEET ADVANCING MECHANISM.  
 APPLICATION FILED MAR. 9, 1918.

Patented Mar. 2, 1920.

4 SHEETS—SHEET 2,

1,332,718.

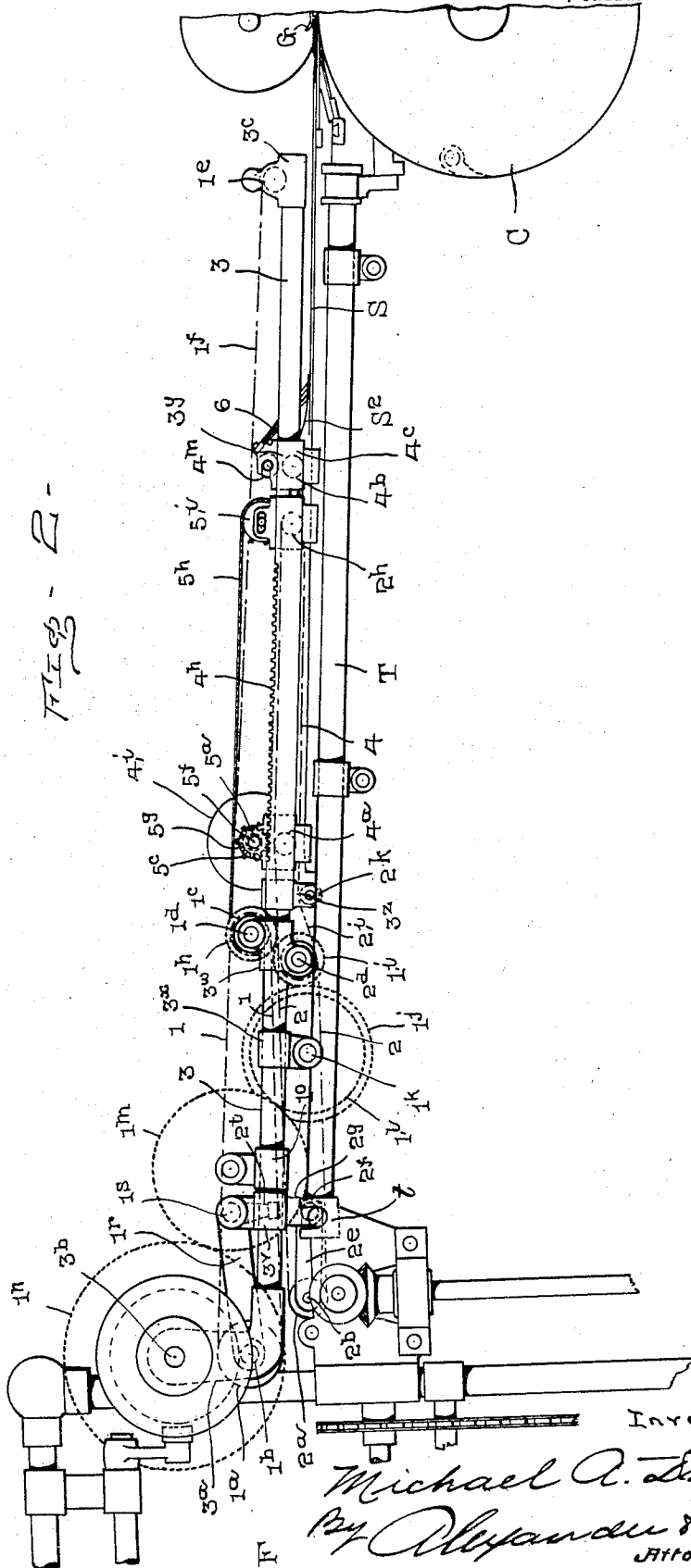


Fig. 2-

Inventor

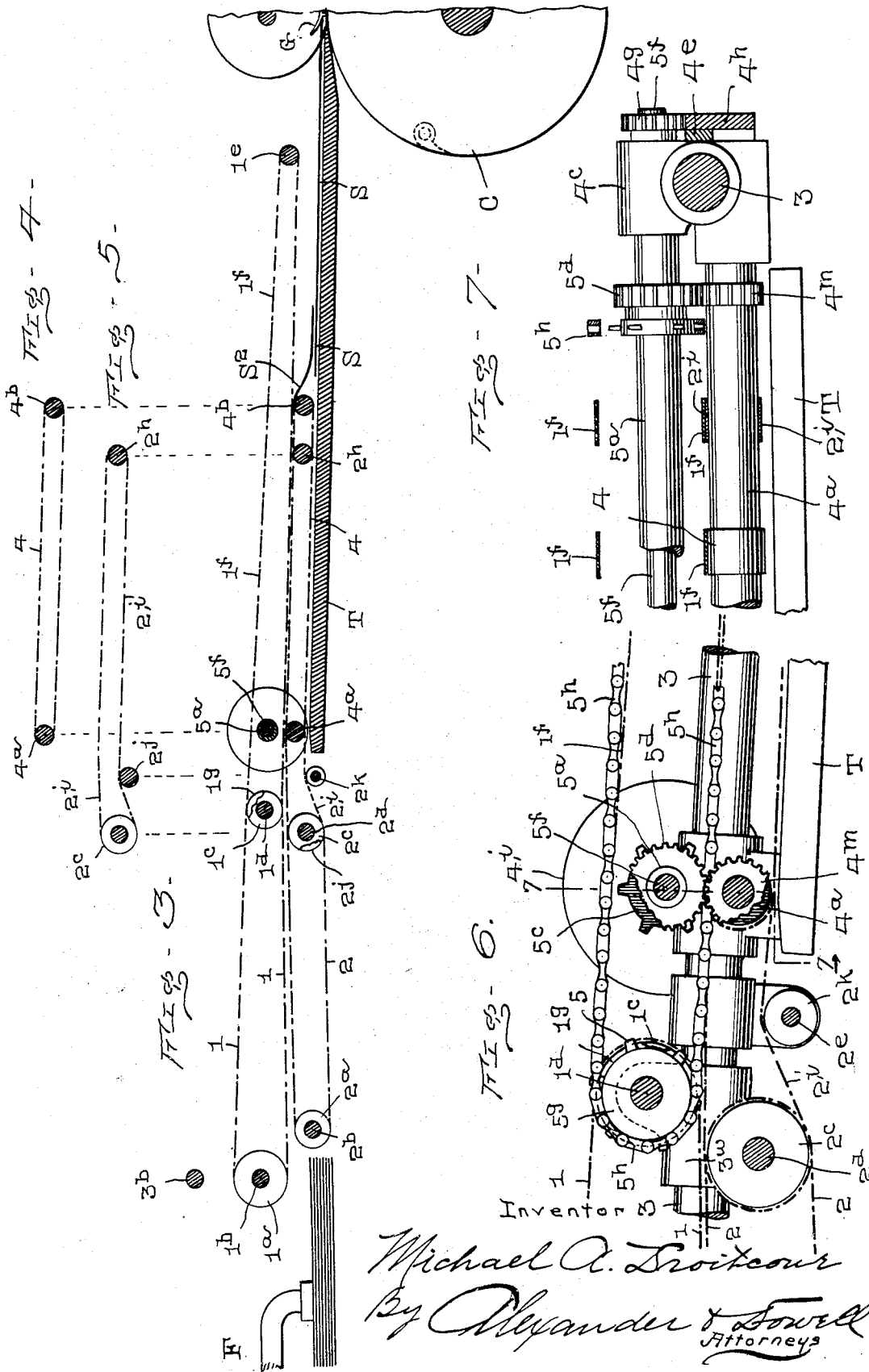
Michael A. Droitcour  
 By Alexander & Fowell  
 Attorneys

M. A. DROITCOUR.  
 SHEET ADVANCING MECHANISM.  
 APPLICATION FILED MAR. 9, 1918.

1,332,718.

Patented Mar. 2, 1920.

4 SHEETS—SHEET 3,



Inventor  
 Michael A. Droitcour  
 By Alexander & Sowell  
 Attorneys

M. A. DROITCOUR.  
SHEET ADVANCING MECHANISM.  
APPLICATION FILED MAR. 9, 1918.

1,332,718.

Patented Mar. 2, 1920.

4 SHEETS-SHEET 4

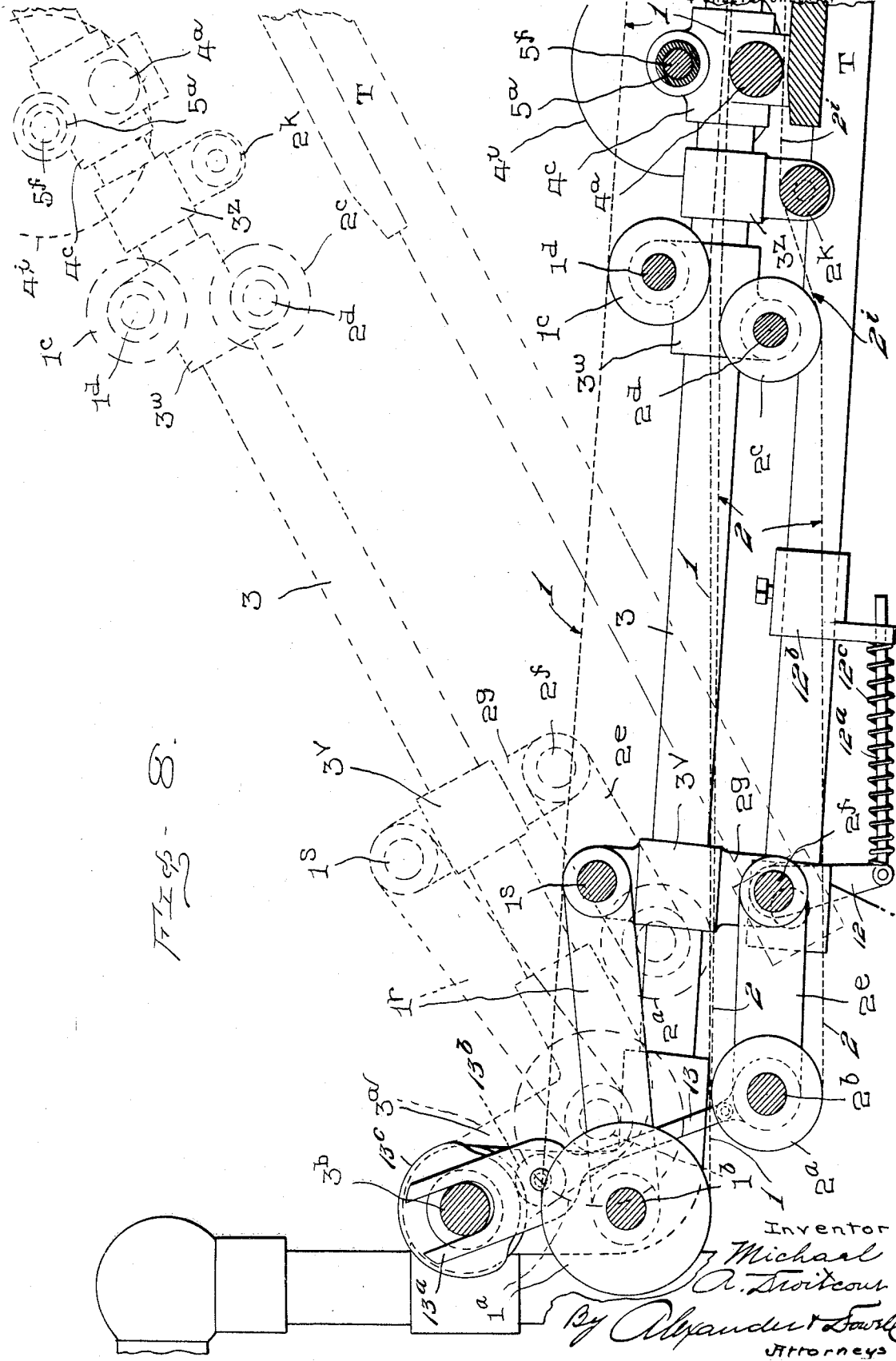


FIG. 8.

Inventor  
Michael  
A. Droitcour  
By Alexander S. Bawle  
Attorneys

# UNITED STATES PATENT OFFICE.

MICHAEL ANDREW DROITCOUR, OF DELPHOS, OHIO.

## SHEET-ADVANCING MECHANISM.

1,332,718.

Specification of Letters Patent.

Patented Mar. 2, 1920.

Application filed March 9, 1918. Serial No. 221,466.

*To all whom it may concern:*

Be it known that I, MICHAEL A. DROITCOUR, a citizen of the United States, residing at Delphos, in the county of Van Wert and State of Ohio, have invented certain new and useful Improvements in Sheet-Advancing Mechanism; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in mechanism for forwarding sheets of paper, and the like; and is particularly adapted and designed for use in connection with automatic sheet feeding mechanisms for sheet printing presses, and the like; and the principal objects of the invention are (1) to provide means whereby the sheets may be fed down to the sheet gages or taking point in such manner that the sheet of paper in its travel from the feeder to the front stop gages on the press can be slowed, and breaking of the edges of the sheet and improper register due to such breaking or to rebound of sheet when hitting the stop gages will be obviated. The invention also provides novel means for advancing the sheets from the feeding device to the taking point in such manner that after one sheet has reached the taking point or front registering gages, the next succeeding sheet may be advanced partly over the properly positioned sheet; which method of feeding the sheets permits the sheets to be slowed down so that when they reach the front gages they are easily stopped without any nicking of their edges or rebounding.

In a machine embodying the present invention when the leading sheet of paper has reached the front feed guides or stop gages of the press and is being registered against the side guides, the leading edge of the next following sheet drops onto the rear of the first sheet, and the second sheet continues to travel forward over the top of the leading sheet; until the cylinder grippers or other taking means, seize and withdraw the leading sheet from beneath the following sheet; and the latter is moved up to the gages and takes the place of the leading sheet while the next succeeding sheet advances thereon, as described.

The invention also provides a novel adjustable sheet advancing mechanism to enable sheets of different lengths to be ad-

vanced in the manner described. The invention also provides novel means enabling the sheet advancing mechanism to be swung up out of the way of the feed table to enable sheets to be fed by hand from the table if desired; and to enable the table to be swung up out of the way to facilitate the making ready of the press.

I will describe one practical embodiment of the invention as illustrated in the accompanying drawings to enable others skilled in the art to adapt and use the same; but I do not consider the invention restricted to use with printing presses; nor to the specific construction of parts illustrated in the accompanying drawings; and therefore refer to the claims for summaries of the essential features of the invention and novel constructions and novel combinations of parts for which protection is desired.

In said drawings:

Figure 1 is a plan view, partly broken away of a sheet advancing mechanism embodying the invention.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is a longitudinal diagrammatical section of Fig. 1.

Figs. 4 and 5 are detail views of some of the sets of tapes shown in Fig. 3 separated.

Fig. 6 is an enlarged detail sectional view on line 6—6 Fig. 1.

Fig. 7 is a sectional view on line 7—7 Fig. 6.

Fig. 8 is an enlarged sectional view showing the hinged connections of the tape supporting frame and of the table whereby the system of tapes and the table can be raised out of the way when making ready the press.

The invention may be used in connection with various types of automatic feeders, and various types of printing presses or other mechanisms for operating upon sheets, as it has particular reference to the means for handling and controlling the sheets between the automatic feeder or sheet selecting means, whereby the sheets are separated from the pile and started toward and over the feed table, and the means for taking the sheets from the feed table, which may be the impression cylinder of a two revolution flat-bed press, or some other mechanism.

In said drawings F designates an automatic feeder mechanism which may be of any suitable construction, adapted to re-

move sheets from a pile and deliver them into the bite of upper and lower sets of tapes, 1 and 2, (see Fig. 3) by which the sheets are advanced over a feed table T, which may be of any suitable construction, toward the cylinder or taking device C, the sheets being arrested at the taking point in the example shown by means of front gages or stops G, which may be of the usual construction.

The upper set of tapes 1 are rider tapes, and in the construction shown said tapes run over tape pulleys 1<sup>a</sup> and 1<sup>c</sup> on shafts 1<sup>b</sup> and 1<sup>d</sup>, which are mounted in suitable bearings connected with the side members 3 of a hinged supporting frame, the side members 3 being connected by suitable transverse ties.

Preferably shaft 1<sup>b</sup> is mounted in arms 1<sup>r</sup> attached to a shaft 1<sup>s</sup>, (see Figs. 1 and 8) mounted in brackets 3<sup>v</sup> attached to the members 3.

Preferably the shaft 2<sup>b</sup> carrying the tape wheels 2<sup>a</sup> is mounted in arms 2<sup>e</sup>, which are attached to a shaft 2<sup>f</sup>, supported in the brackets 3<sup>v</sup> below shaft 1<sup>s</sup>.

The tapes 2 extend between and over tape wheels 2<sup>a</sup> and 2<sup>c</sup>, mounted upon shafts 2<sup>b</sup> and 2<sup>d</sup>; shaft 2<sup>d</sup> being journaled in bearings or brackets 3<sup>w</sup> attached to the side bars 3.

The members 3 are connected at their inner ends to elbow castings 3<sup>a</sup>, which may be hung on a transverse shaft 3<sup>b</sup> journaled in the framing so that the said hinged supporting frame and all parts connected therewith may be moved upward upon the shaft 3<sup>b</sup> as a pivot or hinge. (See Fig. 8.) The side members 3 extend beyond the bearings of the shaft 1<sup>d</sup> to a point adjacent the cylinder C and are provided on their ends with brackets 3<sup>c</sup> in which is journaled a tape roller 1<sup>e</sup>. A second set of top or rider tapes 1<sup>r</sup> are arranged between and supported by the roller 1<sup>e</sup> and tape pulleys 1<sup>s</sup> mounted on the shaft 1<sup>d</sup> intermediate the tape pulleys 1<sup>c</sup> thereon, so that both sets of rider tapes 1 and 1<sup>r</sup> travel in the same direction.

The upper run of the tapes 2 meet the lower run of the tapes 1, and between them the sheets are carried forward from the feeder toward the table or feed board T.

(See Fig. 3.) The rollers 2<sup>a</sup> are preferably yieldingly pressed upward by means of a spring 12 as shown in Fig. 8. An arm 12 may be attached to the shaft 2<sup>f</sup> and to this arm and connected to one end rod 12<sup>a</sup> the other end of which passes through a bracket 12<sup>b</sup> fastened to the adjacent side bar of the table T, an expansion spring 12<sup>c</sup> is strung on rod 12<sup>a</sup> between the arm 12 and the bracket 12<sup>b</sup> and the normal tendency of this spring is to rock shaft 2<sup>f</sup> and thereby swing rollers 2<sup>a</sup> yieldingly upward. The rollers 2<sup>a</sup> may be depressed at intervals, so as to separate the receiving ends of the tapes 1 and 2 in order to receive a sheet from the feeder,

by any suitable means. As shown a slidable bar 13 has one end engaged with one of the arms 2<sup>e</sup> and its other end 13<sup>a</sup> is preferably slotted and slidably embraces the shaft 3<sup>b</sup>. Said bar 13 is preferably provided with a cam roller 13<sup>b</sup> adapted to engage a cam 13<sup>c</sup> keyed on the shaft 3<sup>b</sup>, the cam being so shaped that at the proper time it will engage roller 13<sup>b</sup> and depress the bar 13 thereby depressing arms 2<sup>e</sup>, against the tension of the spring 12<sup>c</sup>, and separating the tapes 1 and 2 and holding them separated for the proper length of time to permit the entrance of a sheet therebetween, then the cam permits rollers 2<sup>a</sup> to rise, and the tapes carry the sheet forward.

Journaled in brackets 3<sup>v</sup> attached to the side members 3 intermediate the shafts 2<sup>d</sup> and 1<sup>c</sup> is a roller shaft 2<sup>h</sup>, and a second set of carrier tapes 2<sup>i</sup> extends between and over the roller 2<sup>h</sup> and tape wheels 2<sup>j</sup> mounted on the shaft 2<sup>a</sup> intermediate the tape wheels 2<sup>c</sup> thereon. In order to keep the lower run of the tapes 2<sup>i</sup> clear of the feed board an idler roller 2<sup>k</sup> may be mounted in brackets 3<sup>z</sup> on the members 3, as indicated in the drawings.

Below the rider tapes 1<sup>r</sup> and above the feed board T is a set of adjustable forwarding tapes 4, which run over rollers 4<sup>a</sup> and 4<sup>b</sup>, journaled in bearings 4<sup>c</sup> and 4<sup>d</sup>, slidably mounted upon the side members 3 adjacent bearings 4<sup>c</sup>, 4<sup>d</sup> being rigidly connected together by tie bars 4<sup>e</sup>, and together forming a movable supporting frame for the tapes 4. This movable frame may be adjusted longitudinally of the feed board and beneath the tapes 1<sup>r</sup> by any suitable means.

As shown a tubular shaft 5<sup>a</sup> is mounted in the brackets 4<sup>c</sup> above shaft 4<sup>a</sup>, and through this shaft 5<sup>a</sup> extends a shaft 5<sup>f</sup> which is provided on its ends outside the bearings 4<sup>c</sup> with pinions 4<sup>g</sup>, meshing with a rack on bars 4<sup>h</sup> which are attached to the castings 3<sup>z</sup>, 3<sup>v</sup> on the side members 3 carrying the bearings for the rollers 2<sup>h</sup> and 2<sup>j</sup>. The shaft 5<sup>f</sup> may be turned by a hand wheel 4<sup>i</sup> on one end thereof so as to adjust the set of advancing tapes 4 toward or from the roller 1<sup>e</sup>, or registering point of the sheet.

The sets of tapes may be driven in any suitable manner. In the construction illustrated shaft 1<sup>d</sup> has a gear 1<sup>h</sup> on one end (see Fig. 1) meshing with an intermediate gear 1<sup>i</sup>, mounted on a stud attached to the adjacent member 3, and in turn meshing with a gear 1<sup>j</sup> mounted on a stub shaft 1<sup>k</sup> on a bracket 3<sup>x</sup> attached to member 3 and a gear 1<sup>l</sup> fastened to gear 1<sup>j</sup> meshes with an intermediate gear 1<sup>m</sup> mounted on a bracket 1<sup>o</sup> on the adjacent side member 3, gear 1<sup>m</sup> meshing with a gear 1<sup>n</sup> on the shaft 3<sup>b</sup>, which may be driven by any suitable means (not shown) from the feeding mechanism F, or other part of the machine.

The gearing is so proportioned as to im-

part the desired speed of rotation to the shaft 1<sup>d</sup>. From the shaft 1<sup>d</sup> the various tapes are driven and at the same uniform speed.

5 The adjustable set of tapes 4 may be driven from the shaft 1<sup>d</sup> by the following means: on the shaft 1<sup>d</sup> is keyed a sprocket gear 5<sup>e</sup> (see Figs. 1 and 6) over which runs a sprocket chain 5<sup>b</sup>, which also runs over an  
10 idler sprocket 5<sup>i</sup> which may be mounted on a stud attached to one of the brackets 3<sup>v</sup> (see Fig. 1).

The lower run of the sprocket chain 5<sup>b</sup> meshes with a sprocket 5<sup>e</sup> loosely mounted  
15 on a rod or shaft 5<sup>f</sup> mounted in bearings in the brackets 4<sup>e</sup>, shaft 5<sup>f</sup> lying above the roller 4<sup>a</sup>. To the sprocket 5<sup>e</sup> is attached a pinion 5<sup>d</sup> which meshes with a pinion 4<sup>m</sup> attached to the shaft 4<sup>a</sup> (see Fig. 6). Conse-  
20 quently, as the sprocket 5<sup>e</sup> is turned in one direction the roller 4<sup>a</sup> will be driven in the reverse direction and impart motion to the tapes 4 corresponding to and in unison with the movement of tapes 1<sup>f</sup> so that the adja-  
25 cent runs of the tapes 1<sup>f</sup> and 4 travel in the same direction at the same time.

It will be seen that by adjusting the hand wheel 4<sup>i</sup> the set of tapes 4 can be bodily ad-  
30 justed beneath the tapes 1<sup>f</sup> toward or from the roller 1<sup>e</sup>, but no matter to what position the set of tapes 4 is adjusted, they will always travel at the same speed as the tapes 1<sup>f</sup>, and a proper drive and time relation is maintained between the shaft 1<sup>d</sup> and the  
35 roller 4<sup>a</sup> in any adjusted position of the tapes 4.

The tapes 4 are adjusted nearer to or farther from the roller 1<sup>e</sup> in accordance with the length of the sheets being printed; and  
40 should be so adjusted that when the sheet S is deposited on the table T with its forward edge against or very closely adjacent the stop gages G its rear end will clear the roller 4<sup>b</sup>; so that the forward edge of the  
45 next following sheet can be fed forward over the rear of the first sheet, the forward edge of the following sheet overlapping and sliding upon the rear edge of the preceding sheet S, as indicated at S<sup>2</sup> in Figs. 2 and 3.  
50 As the sheets are fed forward, they are smoothed down upon the table T by means of light depressors 6, which may be light brushes attached to the tie bar 4<sup>m</sup> on the inner end of the advancing tape frame, as indicated in the drawings. The depressors or  
55 brushes 6 depress or flatten the tail end of the leading sheet down out of the way of the forward end of the next succeeding sheet and direct the forward edge of the  
60 following sheet down upon the rear of the leading sheet, and iron the air out from underneath the sheets and keep the sheets from bouncing. Each depressor brush is about one inch wide, and I preferably use  
65 two of them, one on each side of the sheet.

It will be seen that when desired the frame carrying the system of sheet forwarding tapes can be turned upward out of the way on the shaft 3<sup>b</sup> as a hinge as indicated in dotted lines in Fig. 8 thus uncovering the  
70 feed board or table T so that sheets could be fed from this table to the press by hand: when the tape system is raised the feed board or table T can be turned upward, on  
gudgeons *t* which form a hinge support 75 therefor. (See Figs. 2 and 8.)

When the tape system is raised however none of the parts become disarranged or out of time as they are all connected with mem-  
80 bers 3 and held in position thereby, and gear 1<sup>m</sup> swings around the gear 1<sup>n</sup>, so that the parts are always kept in proper relation and time. When both the tape system and the feed board are raised the pressman has  
85 ready access to the cylinder or press for the purpose of putting on forms and making ready.

#### Operation.

The sheets are taken successively from the  
90 pile in the feeder F and entered between the tapes 1 and 2 by which they are forwarded to the tapes 4 and 1<sup>f</sup>. The set of advancing tapes 4 should have been previously adjusted so that the roller 4<sup>b</sup> would  
95 be slightly more than the length of a sheet from the registering gages or stops G; such adjustment being readily made by operating the hand wheel 4<sup>i</sup>. The sheet discharged from tapes 1<sup>f</sup> and 4 onto the table T is ar-  
100 rested by suitable sheet stops, or gages G, in position to be taken by the grippers on the cylinder C, or other taking means, and each leading sheet remains momentarily at rest before it is taken; but while such lead-  
105 ing sheet is stopped on the table, the next succeeding sheet is fed forward and partially thereover by the forwarding tapes 1<sup>f</sup> and 4, the forward edge of such succeeding sheet sliding over the tail end of the leading  
110 sheet (as indicated at S<sup>2</sup> in Fig. 3) until the arrested sheet is removed by the grippers on the cylinder. When the grippers take such leading sheet it is quickly with-  
115 drawn from underneath the overlapping sheet, and the latter is then in turn moved up against the gages and arrested thereby, while the next succeeding sheet moving forward, as described, overlaps the tail end of the sheet just registered and advances there-  
120 over until the registered sheet is taken by the cylinder grippers.

By this method of handling the sheets, I am enabled to slow down the surface travel of the sheets fed to the taking point, and  
125 this slowing enables me to get an absolute register of the sheet, and such slow movement is also very advantageous as it prevents marring of the edges of the sheet.

The leading sheet S is fed forward 130

through and over the table 7 against the front registering devices, lying flat upon this table in position to be seized by the cylinder grippers and with no tendency or opportunity for the sheet to be gripped or pushed forward by any actuating devices in the feed. The sheet lies flat upon the table as it does in a hand fed press, and there is no tendency of the sheet to crinkle as there would be if it were supported upon tapes or slats or sticks. The adjustable set of tapes 4 should be so adjusted that the front roller 4<sup>b</sup> will be slightly in rear of a sheet lying upon the table when the latter is properly positioned thereon, and then the following sheet advances over the top surface of the sheet lying flat upon the table, but before the following sheet has advanced far over the sheet lying upon the table the latter is seized and removed by the cylinder grippers. With this arrangement the feed table T is arranged as in a hand fed press and is used both when the sheets are hand fed and also when the sheets are automatically fed so that with my invention the sheets are delivered to the cylinder from the table always in the same position whether fed automatically or by hand.

The set of tapes 4 can be adjusted to suit any length of sheet from the maximum to minimum. Because of this peculiar driving arrangement the tapes 4 while being moved from one position to another are not thrown out of time and they remain in adjusted position while a given size of sheets is being printed.

What I claim is:

1. In apparatus having sheet selecting devices, sheet operating devices, and a table intermediate the sheet selecting and sheet operating devices; tapes and actuating means therefor adapted to forward sheets from the selecting devices across the table to the sheet operating means; and a support for all said tapes and actuating means whereby the tapes and actuating means can be simultaneously raised out of the way; said table being also movable out of the way when the support is raised.

2. In combination sheet selecting devices, sheet operating devices, and a table intermediate the sheet selecting and sheet operating devices; of forwarding tapes adapted to forward sheets from the selecting devices across the table to the sheet operating means; a support for said tapes and their actuating devices whereby the tapes and their actuating devices can be raised out of the way, said table being also movable out of the way when the tape support is raised; means for adjusting the tape on the frame toward or from the sheet operating means, and sheet depressing brushes arranged adjacent the forward bends of the adjustable tapes.

3. In sheet handling mechanism having sheet feeding devices, sheet taking devices, a table intermediate the sheet selecting and sheet operating devices and sets of opposed tapes adapted to forward sheets from the feeding devices across the table to the sheet taking devices; a tiltable frame carrying all of said tapes and their operating devices whereby the tapes and operating devices can be raised out of the way without disarranging the tapes or their operating devices; said table being also tiltable so that it can be also raised out of the way when the tapes are elevated.

4. In combination sheet feeding means, sheet operating means, sets of opposed carrier tapes for forwarding sheets from the feeding means to the operating means, means for driving said tapes and means for bodily adjusting one set of the carrier tapes toward or from the sheet operating or taking devices, with a frame on which all of said sets of tapes and their driving and adjusting means are mounted, said frame being hinged so that the tapes and said means can be raised out of the way without disarranging the tapes or their driving means.

5. In sheet handling mechanism having sheet selecting devices, sheet operating devices, a table intermediate the sheet selecting and sheet operating devices and sets of tapes adapted to forward sheets from the selecting devices across the table to the sheet operating devices; a support for all of said tapes, means on said support for operating the tapes, means for bodily adjusting one set of the tapes on said support toward or from the sheet operating devices, said support being tiltable so that the tapes and their operating means can be raised out of the way without disarranging the tapes or their operating means; and said table being also tiltable so that it can be raised out of the way when the tapes are elevated.

6. In sheet handling mechanism having sheet feeding devices, sheet taking devices, a table intermediate the sheet selecting and sheet taking devices and sets of tapes adapted to forward sheets from the feeding devices across the table to the sheet taking devices; a tiltable frame carrying said tapes and their operating devices whereby the tapes and their operating devices can be raised out of the way without disarranging the tapes or their operating devices; means for adjusting tapes on the support toward or from the sheet taking devices, and brushes movable with said adjustable tapes; said table being also tiltable so that it can be also raised out of the way when the tapes are elevated.

7. In combination sheet feeding means, sheet operating means; coacting carrier and rider tapes for receiving sheets from the feeding means and moving same toward the



- operating means; a second set of rider tapes extending from the first rider tapes to a point near the operating means; a second set of carrier tapes extending from the first carrier tapes toward the operating means; a movable set of carrier tapes telescoping with the second set of carrier tapes and coacting with the second set of rider tapes; and means for adjusting the movable carrier tapes toward or from the operating means, with means enabling all said tapes to be moved bodily into and out of operative position as desired without disturbing their relative adjustments or slacking the tapes.
8. In combination a set of carrier tapes, a movable set of carrier tapes telescoping therewith; means for adjusting the movable set of tapes longitudinally relative to the first set; an endless driving member, gearing for driving said member at a speed uniform with that of the stationary set of carrier tapes, and gearing movable with the movable set of tapes and driven by said member whereby the tapes of the movable set are traveled in time with the other tapes.
9. In combination, a stationary set of carrier tapes, a movable set of carrier tapes telescoping the first set; means for adjusting the movable set longitudinally relative to the first set; means for driving said movable carrier tapes in unison with the other carrying tapes, comprising an endless sprocket-chain, means for driving said chain at a speed uniform with that of the first set of carrier tapes; and gearing between said chain and one of the shafts of the movable sets of tapes, said gearing being movable with said movable set of tapes, whereby the movable set of tapes is kept in time with the other tapes.
10. In combination coacting carrier and rider tapes for receiving sheets and moving same toward a taking means, the rider tapes extending to a point near the taking means; movable carrier tapes telescoping with the first carrier tapes and co-acting with the rider tapes; and means for adjusting the movable carrier tapes toward or from the taking means, with a supporting frame on which all of said tapes and their operating devices are mounted, said frame being movable so that the tapes and their operating devices can be raised out of the way without disturbing the adjustment of the tapes or their operating devices.
11. In combination coacting carrier and rider tapes for receiving sheets and moving same toward a sheet taking means; a second set of rider tapes extending from the first rider tapes to a point near the taking means; a movable set of carrier tapes telescoping with the first carrier tapes and coacting with the second set of rider tapes; and means for adjusting the movable carrier tapes toward or from the operating means; with a supporting frame on which all of said tapes and their operating devices are mounted, said frame being movable so that the tapes and tape operating devices can be moved out of the way without disarranging the tapes or their operating devices.
12. In combination with sheet feeding means, and sheet operating means; of coacting carrier and rider tapes for moving sheets toward the operating means, said rider tapes extending beyond said carrier tapes to a point near the operating means; a movable set of carrier tapes telescoping with the other carrier tapes and coacting with the extended portions of the rider tapes; means for adjusting the movable set of carrier tapes toward or from the operating means; and a hinged supporting frame on which all of said tapes and their operating devices are mounted, said frame being tiltable so that the tapes and tape operating devices thereon can be together raised out of the way, without disarranging the tapes and their operating devices.
13. In combination a set of carrier tapes, a movable set of carrier tapes telescoping therewith; means for adjusting the movable set longitudinally relative to the first set; a set of rider tapes coacting with said carrier tapes and extending beyond the first set of carrier tapes; and means for driving said movable carrier tapes in unison with the other tapes, and a supporting frame on which all of said tapes and their operating devices are mounted, said frame being tiltable so that all the tapes and their operating devices can be raised out of the way without disarranging the tapes or their driving means.
14. In combination a set of carrier tapes, a moveable set of carrier tapes telescoping therewith; means for adjusting the movable set longitudinally relative to the first set; a movable set of rider tapes coacting with said carrier tapes and telescoping with and extending beyond the first set of carrier tapes; and means for driving said movable carrier tapes in unison with the other tapes; with a supporting frame on which all of said tapes and their operating devices are mounted, said frame being tiltable so that the tapes and tape operating devices can be raised out of the way.
15. In combination a set of carrier tapes, a movable set of carrier tapes telescoping therewith; means for adjusting the movable set of tapes longitudinally relative to the first set; an endless driving member, gearing for driving said member at a speed uniform with that of the stationary set of carrier tapes, and gearing movable with the movable set of tapes and driven by said member whereby the tapes of the movable set are traveled in time with the other tapes; with a supporting frame on which all of said

tapes and their operating devices are mounted, said frame being tiltable so that the tapes and tape operating devices can be raised out of the way.

5 16. In combination, a stationary set of carrier tapes, a movable set of carrier tapes telescoping the first set; means for adjusting the movable set longitudinally relative to the first set; means for driving said movable  
10 carrier tapes in unison with the other carrying tapes; comprising an endless sprocket-chain means for driving said chain at a speed uniform with that of the first set of carrier tapes, and gearing between said  
15 chain and one of the shafts of the movable sets of tapes, said gearing being movable with said movable set of tapes, whereby the movable set of tapes is kept in time with the other tapes; with a hinged supporting frame  
20 on which all of said tapes and their operating devices are mounted, said frame being tiltable so that the tapes and their operating devices can be raised out of the way without disarranging the tapes, their driving means  
25 or their relative time.

17. In combination sheet feeding means, sheet operating means, a table interposed between said means; means for transferring sheets from the feeding means over the table  
30 to the operating means, said transferring means comprising coacting carrier and rider tapes for moving sheets to the table; said rider tapes extending beyond said carrier tapes over the table to a point near the operating means, a movable set of carrier tapes telescoping with the other carrier tapes and adjustable over the table and coacting with the extended portions of the rider tapes, and means for adjusting the movable set of carrier tapes over the table toward or from the operating means.  
40

18. In combination sheet feeding means, sheet operating means, a table between said means; and means for transferring sheets from the feeding means over the table to the operating means, said transferring means comprising coacting carrier and rider tapes for receiving sheets from the feeding means and moving same to the table, the rider tapes extending beyond the carrier tapes over the table to a point near the operating means; a second movable set of carrier tapes above the table and telescoping with the first carrier tapes and coacting with extended portions of the rider tapes; and means for adjusting the movable set of carrier tapes over the table toward or from the operating means with means enabling all said tapes to be moved bodily into and out of operative positions as desired, without disturbing their relative adjustments or slacking the tapes.  
60

19. In combination with sheet feeding means, sheet operating means; a table be-

tween the said means; coacting carrier and rider tapes for receiving sheets from the feeding means and moving same toward the table; a second set of rider tapes extending from the first rider tapes over the table to a point near the operating means, a second set of carrier tapes extending from the first carrier tapes over the table toward the operating means, a movable set of carrier tapes over the table telescoping with the second set of carrier tapes and coacting with the second set of rider tapes, and means for adjusting the movable carrier tapes over the table toward or from the operating means with means enabling all said tapes to be moved bodily into and out of operative position as desired without disturbing their relative adjustments or slacking the tapes.  
70  
75  
80

20. In combination sheet feeding means, sheet operating means, a table interposed between said means; means for transferring sheets from the feeding means over the table to the operating means, said transferring means comprising coacting carrier and rider tapes for moving sheets to the table, said rider tapes extending beyond said carrier tapes over the table to a point near the operating means; a movable set of carrier tapes telescoping with the other carrier tapes and adjustable over the table and coacting with the extended portions of the rider tapes, and means for adjusting the movable set of carrier tapes over the table toward or from the operating means; with a supporting frame on which all of said tapes and their operating devices are mounted, said frame being tiltable so that it and the tapes and tape operating devices can be raised out of the way; and said table being also tiltable out of the way when the tape supporting frame is raised.  
85  
90  
95  
100  
105

21. In combination sheet feeding means, and sheet operating means, a table between said means; means for transferring sheets from the feeding means over the table to the operating means, said transferring means comprising coacting carrier and rider tapes for receiving sheets from the feeding means and moving same to the table, the rider tapes extending beyond the carrier tapes over the table to a point near the operating means; a movable set of carrier tapes above the table and telescoping with the first carrier tapes and coacting with extended portions of the rider tapes; and means for adjusting the movable set of carrier tapes over the table toward or from the operating means; with a supporting frame on which all of said tapes and their operating devices are mounted, said frame being tiltable so that it and the tapes and tape operating devices can be raised out of the way; and said table being also tiltable out of the way when the tape supporting frame is raised.  
110  
115  
120  
125

22. In combination with sheet feeding means, sheet operating means; a table between the said means; a coacting carrier and rider tapes for receiving sheets from the feeding means and moving same toward the table; a second set of rider tapes extending from the first rider tapes over the table to a point near the operating means, a second set of carrier tapes extending from the first carrier tapes over the table toward the operating means, a movable set of carrier tapes over the table telescoping with the second set of carrier tapes and coacting with the second set of rider tapes, and means for adjusting the movable carrier tapes over the table toward or from the operating means; with a supporting frame on which all of said tapes and their operating devices are mounted, said frame being tiltable to move the tapes and tape operating devices out of the way without disarranging the tapes or their driving means, and said table being also tiltable out of the way when the tape supporting frame is raised
23. In combination coacting carrier and rider tapes for receiving sheets and moving same toward a taking means, the rider tapes extending to a point near the taking means; with a set of movable carrier tapes telescoping with the first carrier tapes and coacting with the rider tapes, means for adjusting the set of movable carrier tapes toward or from the taking means, and sheet depressing devices adjacent the forward end of the set of movable carrier tapes and movable therewith.
24. In combination coacting carrier and rider tapes for receiving sheets and moving same, said rider tapes extending beyond the carrier tapes, and a set of movable carrier tapes telescoping with the carrier tapes and coacting with the rider tapes, means for adjusting the movable carrier tapes beneath the extended portions of the rider tapes, and brushes attached to the supports of the movable set of tapes adjacent the forward bends of such tapes.
25. In combination coacting carrier and rider tapes for receiving sheets and moving same toward a sheet taking means, a second set of rider tapes extending from the first rider tapes to a point near the operating means; a movable set of carrier tapes telescoping with the first carrier tapes and coacting with the second set of rider tapes; means for adjusting the movable carrier tapes toward or from the operating means, and sheet depressing devices adjacent the forward end of the set of movable carrier tapes and movable therewith.
26. In combination with sheet feeding means, and sheet operating means, coacting carrier and rider tapes for moving sheets toward the operating means; said rider tapes extending beyond said carrier tapes to a point near the operating means, a movable set of carrier tapes telescoping with the other carrier tapes and coacting with the extended portions of the rider tapes, means for adjusting the movable set of carrier tapes toward or from the operating means, and brushes attached to the supports of the movable set of tapes adjacent the forward bends of such tapes.
27. In combination with a set of carrier tapes, a movable set of carrier tapes telescoping therewith; means for adjusting the movable set longitudinally relative to the first set; a set of rider tapes coacting with said carrier tapes and extending beyond the first set of carrier tapes; an endless driving member, gearing for driving said member at a speed uniform with that of the stationary set of carrier tapes, and gearing between the movable set of tapes and said endless member, said gearing being movable with the movable set of tapes whereby the movable set of tapes is kept in time with the other tapes.
28. In combination with a stationary set of carrier tapes, a movable set of carrier tapes telescoping the first set; means for adjusting the movable set longitudinally relative to the first set; and a set of rider tapes above and extending beyond the said carrier tapes and coacting therewith to forward the sheets; of an endless sprocket-chain and sprockets fixed relative to the movable set of tapes, gearing for driving said chain at a speed uniform with that of the first set of carrier tapes; and gearing between said chain and one of the shafts of the movable sets of tapes, such gearing being movable with the movable set of tapes whereby the movable set of tapes is kept in time with the other tapes.
29. In combination tapes for receiving sheets and moving same toward a taking means, and means for adjusting the set of movable carrier tapes toward or from the taking means; with devices for depressing the sheet adjacent the discharge end of the set of movable tapes and movable therewith.
30. In combination tapes for receiving sheets and moving same, a set of movable tapes telescoping with the first tapes and means for adjusting the movable tapes; with brushes attached to the supports of the movable set of tapes adjacent the discharge ends of such tapes to depress the sheets.
31. In combination coacting tapes for receiving sheets and moving same toward a sheet taking means, a movable set of carrier tapes, rider tapes coacting therewith and means for adjusting the movable carrier tapes toward or from the operating means; with sheet depressing devices adjacent the

discharge end of the set of movable tapes and movable therewith.

32. In combination sheet feeding means, sheet operating means, carrier tapes for moving sheets toward the operating means; a movable set of carrier tapes telescoping with the first carrier tapes, rider tapes coacting with the movable set of tapes, and means for adjusting the movable set of carrier tapes toward or from the operating means; with brushes attached to the supports of the movable set of tapes adjacent the discharge ends of such tapes.

33. In combination sheet feeding means, sheet operating means; sets of tapes for forwarding sheets from the feeding means to the operating means; a frame on which said tapes and their operating devices are mounted, said frame being hinged so that the tapes and their operating devices can be moved out of operative position or into operative position without disturbing their operative relations or slacking the tapes; means for adjusting the tapes on the frame toward or from the sheet operating means; and sheet depressing devices adjacent the forward bends of the adjustable tapes.

34. In combination coacting carrier and rider tapes for receiving sheets and moving same toward a taking means, the rider tapes extending to a point near the taking means; a set of movable carrier tapes telescoping with the first carrier tapes and coacting with the rider tapes; and means for adjusting the movable carrier tapes toward or from the taking means; with means enabling all said tapes to be moved bodily into and out of operative position as desired, without disturbing their relative adjustments or slackening the tapes.

35. In combination coacting carrier and rider tapes for receiving sheets and moving same, said rider tapes extending beyond the carrier tapes; a set of movable carrier tapes telescoping with the carrier tapes and coacting with the rider tapes; and means for adjusting the movable carrier tapes beneath the extended portions of the rider tapes; with means enabling all said tapes to be moved bodily into and out of operative position as desired, without disturbing their relative adjustments or slacking the tapes.

36. In combination a set of carrier tapes; a movable set of carrier tapes telescoping therewith; means for adjusting the movable set longitudinally relative to the first set; a set of rider tapes coacting with said carrier tapes and extending beyond the first set of carrier tapes; an endless driving member beside said movable set of tapes; and means movable with said movable set of tapes and engaging said endless driving member for driving said movable carrier tapes in any adjusted position.

37. In apparatus having sheet selective means and sheet taking means; upper and lower sets of tapes and devices for operating same to forward sheets from the selecting means to the taking means; and an adjustable support for all said tapes and their operating devices whereby such tapes and their operating devices can be moved bodily out of operative position or into operative position without slacking the tapes or disturbing their operative relations or the position of a sheet therein.

38. In combination sheet feeding means; sheet operating means; a set of tapes for forwarding sheets from the feeding means to the operating means; and an adjustable frame on which all said tapes and their operating devices are mounted, said frame being hinged so that the tapes and their operating devices can be bodily simultaneously moved out of operative position, or into operative position without slacking the tapes or disturbing their operative relations or the position of a sheet in the tapes.

39. An apparatus having sheet selecting devices and sheet taking devices, a table intermediate the sheet selecting devices and the sheet taking devices, upper and lower sets of coacting tapes and actuating means therefor adapted to successively forward sheets from the selecting devices and deliver same onto the table so that each sheet is laid wholly upon the table in position to be seized by the sheet taking devices, substantially as described.

40. In combination sheet selecting devices, a gripper cylinder, a table intermediate the sheet selecting devices and the cylinder, one set of tapes being adjustable relatively to the other, substantially as described, tapes and actuating means therefor adapted to successively forward sheets from the selecting devices and deliver same onto the table so that each sheet is laid wholly upon the said table in position to be taken by the cylinder grippers before being seized by the grippers.

41. In combination; sheet selecting devices, sheet taking devices, a table intermediate the sheet selecting devices and the sheet taking devices, means adapted to successively forward sheets from the selecting devices and deliver same onto the table so that the leading sheet lies wholly upon the table free from the forward devices and in position to be seized by the sheet taking devices; the leading edge of the next succeeding sheet moving forward over the tail end of the leading sheet lying upon the table before the latter sheet is seized by the sheet taking devices.

42. In combination; sheet selecting devices, sheet taking devices, a table intermediate the sheet selecting devices and the sheet taking devices, means adapted to suc-

cessively forward sheets from the selecting devices onto the table in such manner that after the leading sheet is laid upon the table in position to be seized by the sheet taking devices and clear of the feed devices, the leading edge of the next succeeding sheet may move forward over the tail end of the

leading sheet lying upon the table before the latter sheet is seized by the sheet taking devices.

In testimony that I claim the foregoing as my own, I affix my signature.

10

MICHAEL ANDREW DROITCOUR.