April 12, 1966 R. E. J. NORDQUIST 3,245,683

SHEET FEEDING AND GAUGING MECHANISM HAVING A MOVABLE FRONT GAGE

Filed Nov. 4, 1963 6 Sheets-Sheet 1

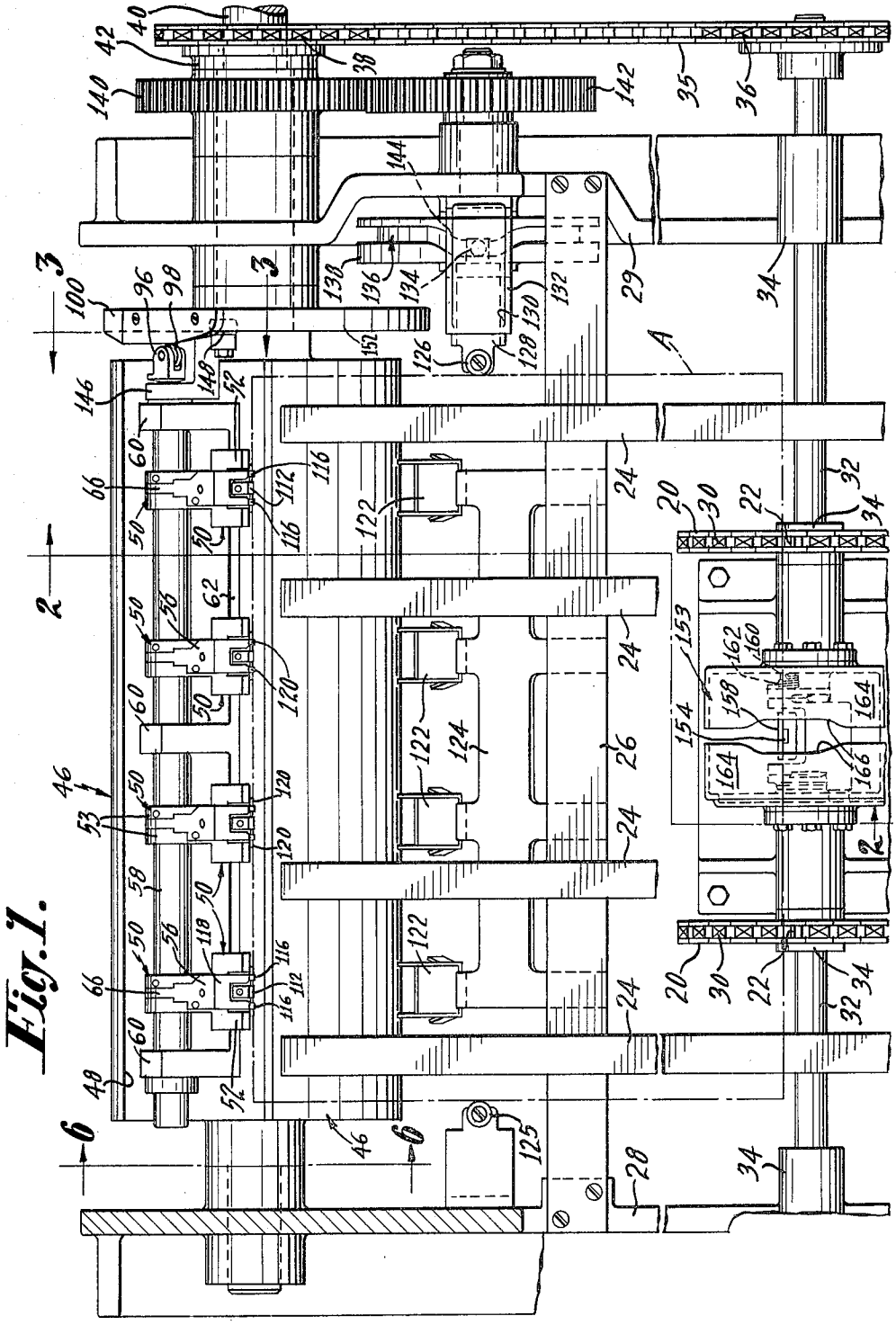


Fig. 1.

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SHEET FEEDING AND GAUGING MECHANISM HAVING A MOVABLE FRONT GAGE

Filed Nov. 4, 1963 6 Sheets-Sheet 2

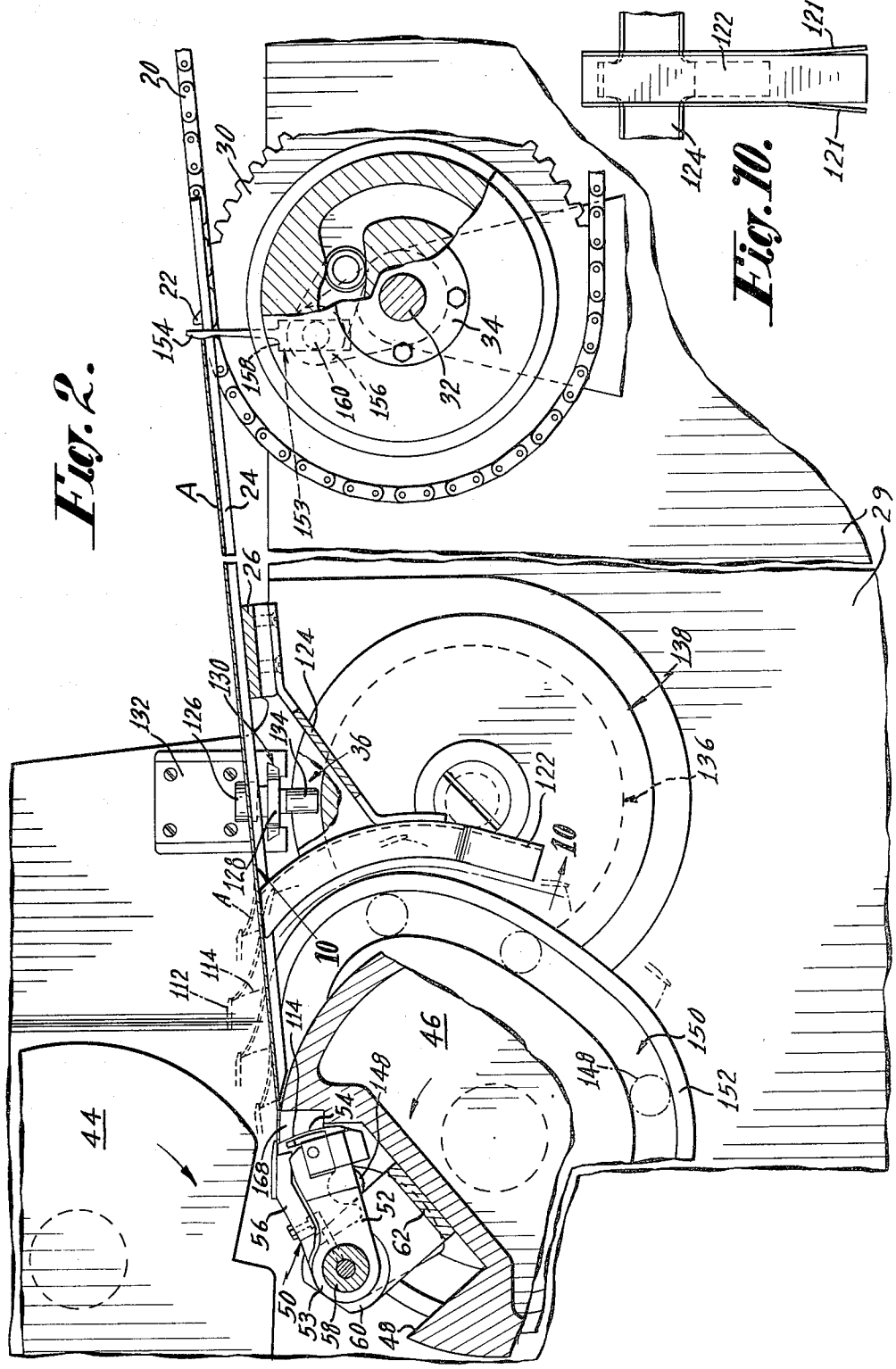


Fig. 2.

Fig. 10.

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SHEET FEEDING AND GAUGING MECHANISM HAVING A MOVABLE FRONT GAGE

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Fig. 3.

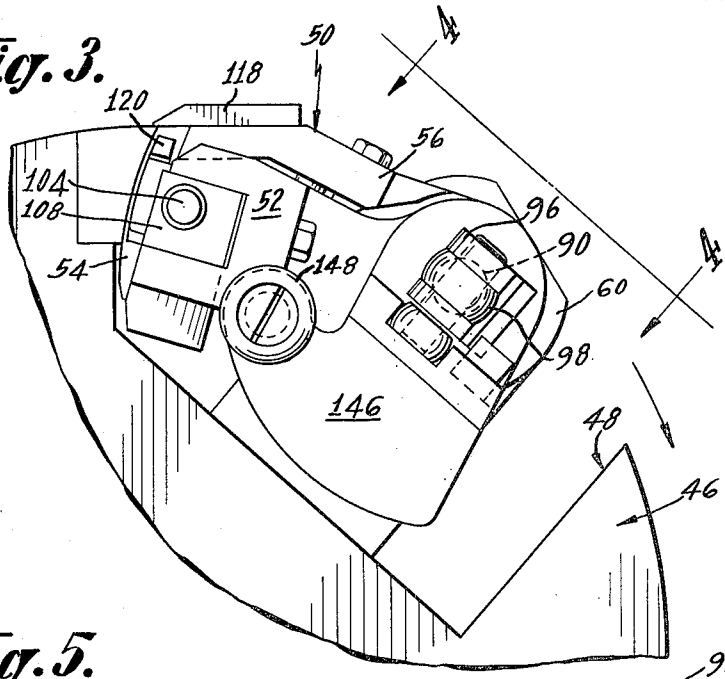


Fig. 5.

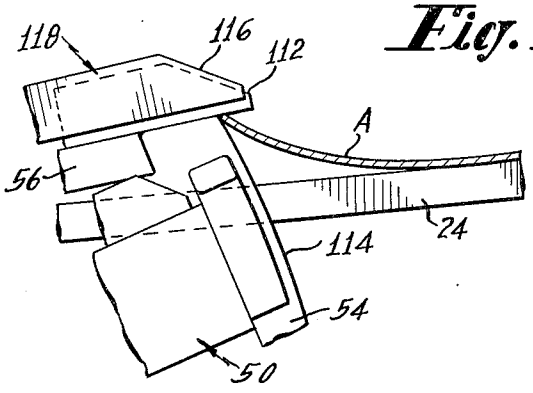


Fig. 4.

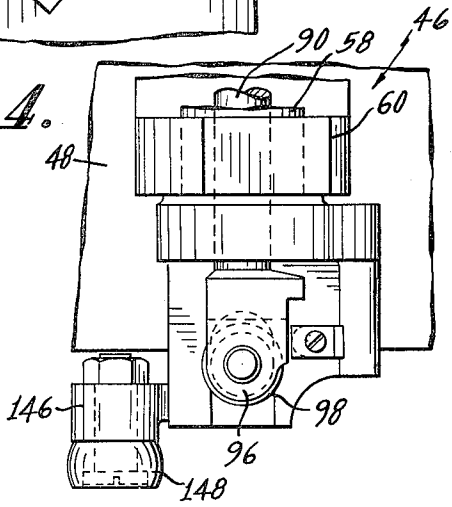
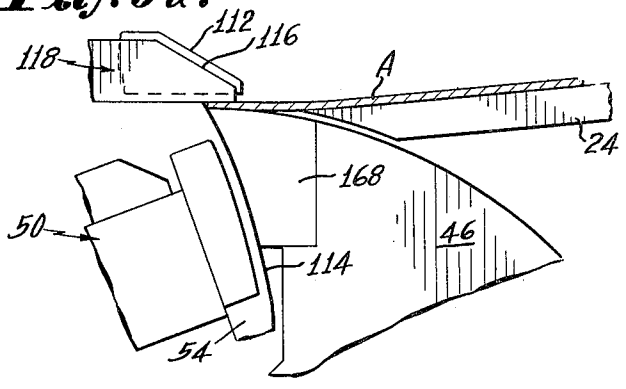


Fig. 5a.



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Fig. 7.

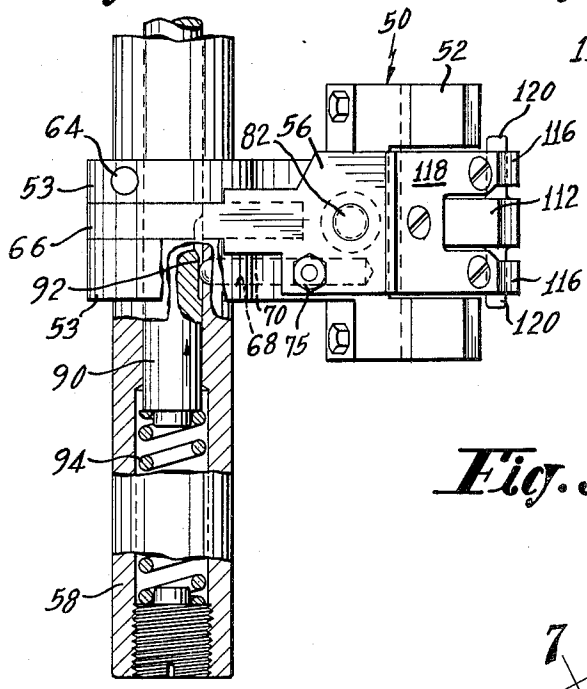


Fig. 8.

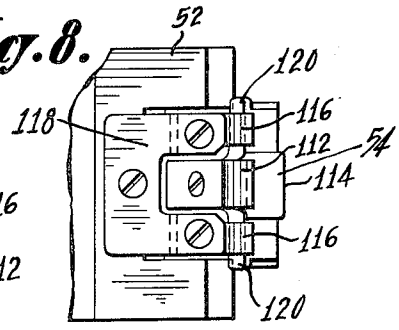


Fig. 9.

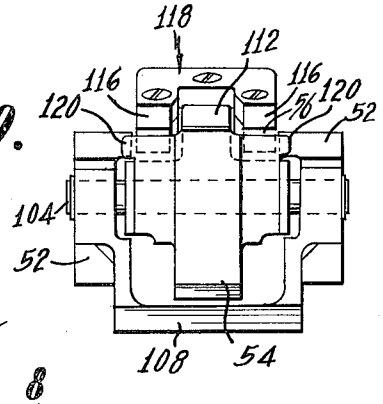
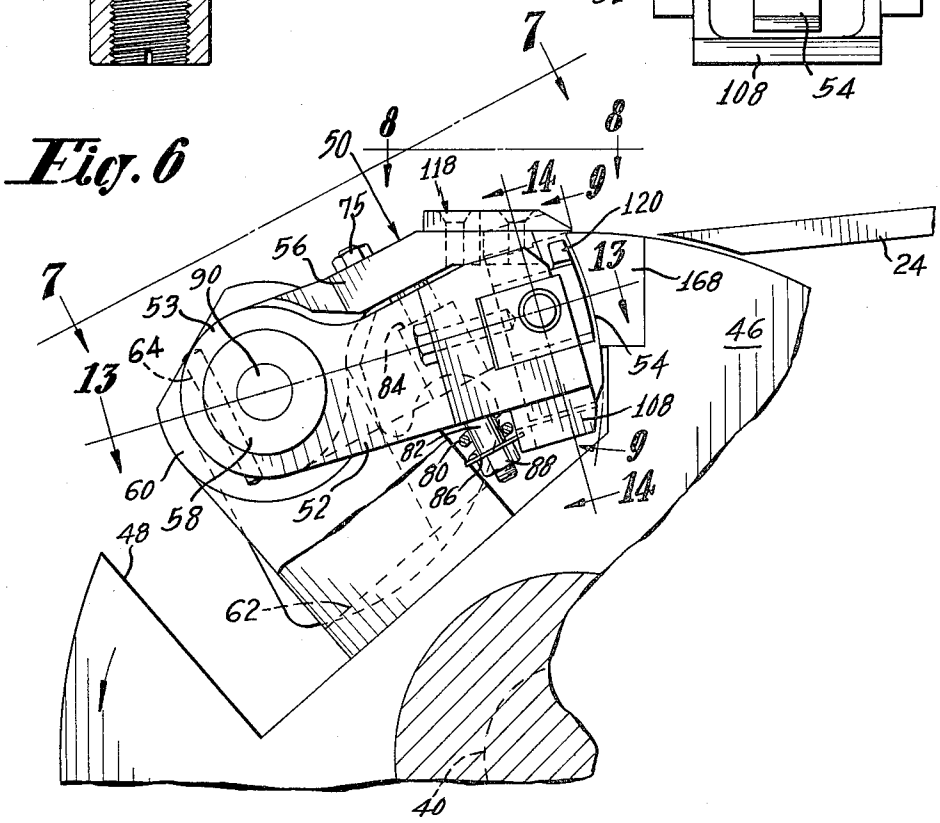


Fig. 6



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SHEET FEEDING AND GAUGING MECHANISM HAVING A MOVABLE FRONT GAGE

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Fig. 11.

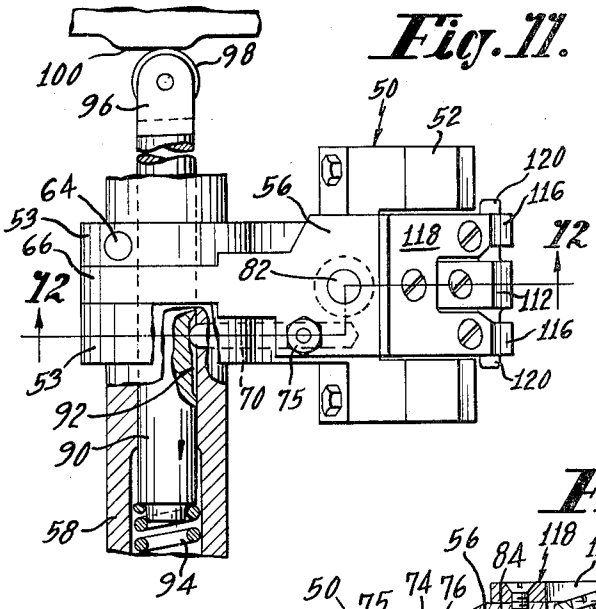
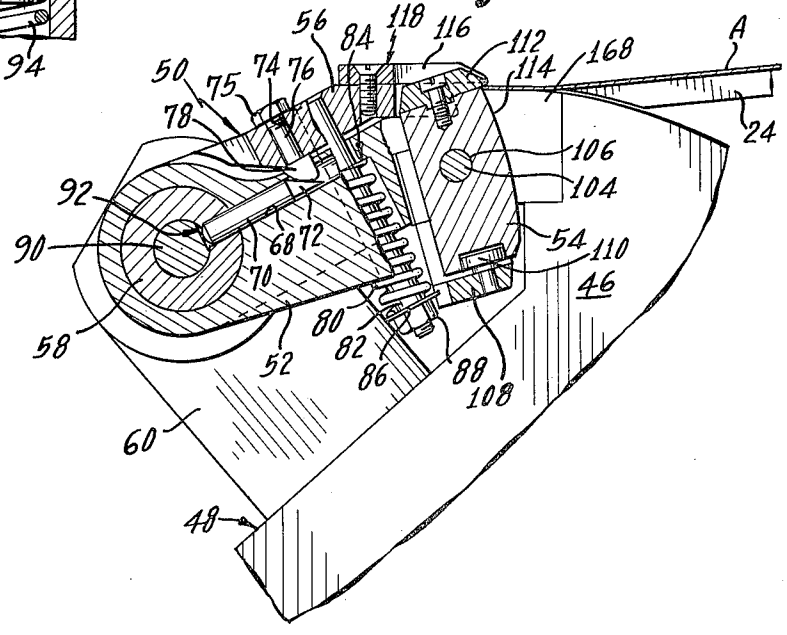


Fig. 12.



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Fig. 13.

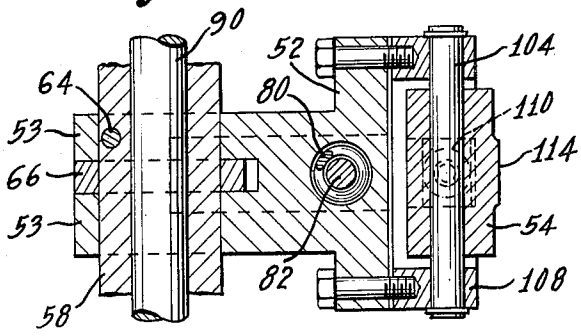


Fig. 14.

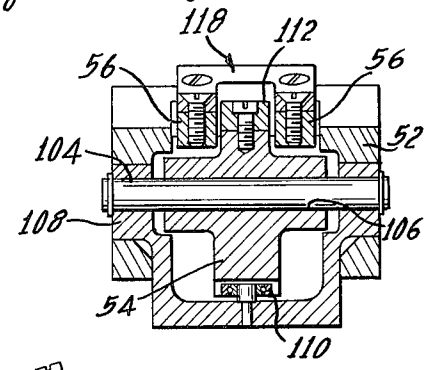
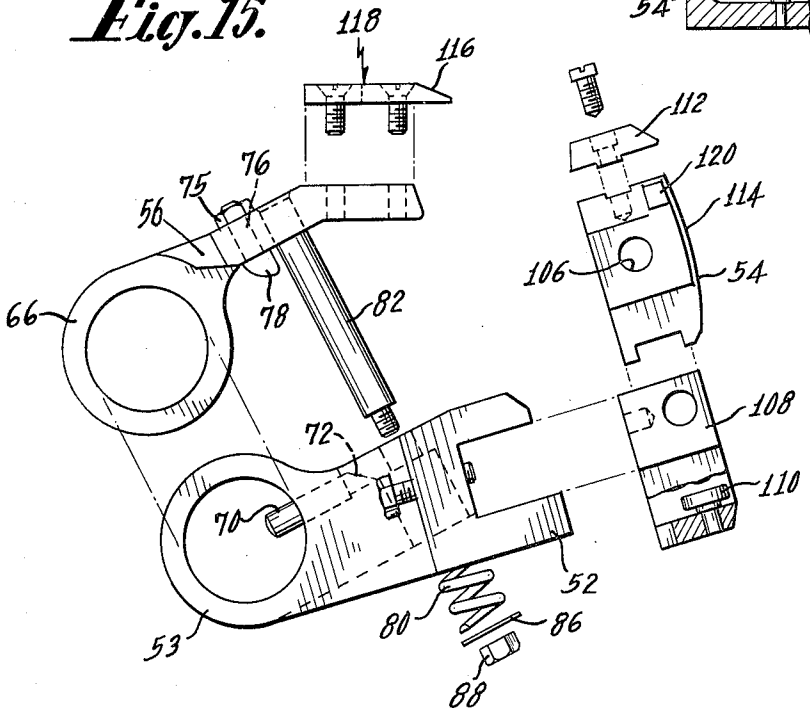


Fig. 15.



United States Patent Office 3,245,683 Patented Apr. 12, 1966

3,245,683

SHEET FEEDING AND GAUGING MECHANISM HAVING A MOVABLE FRONT GAGE

Ronald Erik Johan Nordquist, deceased, late of Mountain Lakes, N.J., by Mathilde T. Nordquist, executrix, Mountain Lakes, N.J., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

Filed Nov. 4, 1963, Ser. No. 321,369
13 Claims. (Cl. 271—48)

The present invention relates to apparatus for feeding and gauging sheet material required to be located in an accurate predetermined position for proper treatment in a machine such as a lithographic press, and more particularly relates to a novel front gauging and gripping mechanism which accurately controls the front register of the sheet while also facilitating the side gauging of the sheet.

In the feeding of sheet material through machines such as printing presses and coating machines where an impression is applied to the sheet material in a predetermined position, and in cutting or other machines where an operation or series of operations are performed on predetermined portions of the sheet material, it is important to accurately gauge the material so that impressions or operations thereon will be received or effected in definite locations on the material.

In the side gauging of such sheet material, the sheet usually is engaged by the side gauging elements substantially simultaneously with the engagement of the leading edge of the sheet by the front gauging elements. Since the front gauging elements are normally rigidly mounted and are in contact with the leading edge of the sheet during the side gauging operation, they create frictional resistance to the lateral movement of the sheet by the side gauging elements. This frictional resistance affects the accuracy of and increases the time necessary for the side gauging of each sheet, which is highly undesirable in a high speed machine wherein the gauging operatons must be performed on the sheet materal in an extremely short period of time.

The general purpose of the present invention, therefore, is to minimize or substantially eliminate this frictional resistance to the side gauging of the sheet material. This is accomplished by providing a novel front gauging and gripping mechanism wherein the front gauge member is laterally slideable with respect to the gripping member a distance which is equal to or greater than the maximum estimated lateral movement of the sheet material during side gauging. Thus, when the leading edge of the sheet engages the front gauge member and the side gauging begins, the front gauge member moves laterally with the sheet and there is substantially no frictional resistance to the side gauging of the sheet.

An object of the present invention is the provision of apparatus for feeding and gauging sheets of material wherein the sheets are rapidly and accurately located in a predetermined position.

Another object is the provision of such apparatus wherein, after the gauging of each sheet, the leading marginal portion thereof is firmly gripped to retain the sheet in the gauged position.

A further object is to provide in such apparatus a front gauging mechanism wherein the front gauge member is movable laterally with the sheet during the side gauging thereof, so as to substantially eliminate frictional resistance to the lateral movement of the sheet.

A still further object is to provide in such feeding and gauging apparatus a means for re-setting the front gauge member to its original or neutral position after it has moved laterally during the side gauging of each sheet.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

FIGURE 1 is a top plan view of a sheet feeding and gauging apparatus embodying the instant invention, with parts broken away and parts shown in section;

FIG. 2 is an enlarged sectional view taken substantially along line 2—2 in FIG. 1;

FIG. 3 is an enlarged sectional view taken substantially along line 3—3 in FIG. 1;

FIG. 4 is a plan view of a portion of the apparatus shown in FIG. 3, the view being taken substantially along the line 4—4 in FIG. 3;

FIGS. 5 and 5*a* are enlarged, fragmentary, side elevational views of the front gripping and gauging mechanism and of the leading portion of a sheet, showing the relative positions of the gripping member, gauge member and sheet during and after the gauging operation, respectively;

FIG. 6 is an enlarged sectional view taken substantially along line 6—6 in FIG. 1 ,with parts broken away;

FIG. 7 is a plan view, partly in section, of a portion of the apparatus shown in FIG. 6, showing the relationship of the parts prior to the gripping of the leading marginal portion of the sheet, the view being taken substantially along the line 7—7 in FIG. 6;

FIG. 8 is a top plan view of a portion of the apparatus shown in FIG. 6, the view being taken substantially along the line 8—8 in FIG. 6;

FIG. 9 is a sectional view taken substantially along line 9—9 in FIG. 6;

FIG. 10 is a fragmentary view taken substantially along line 10—10 in FIG. 2;

FIG. 11 is a view similar to FIG. 7, showing the relationship of the parts during the period when the leading marginal portion of a sheet is being gripped;

FIG. 12 is a sectional view taken substantially along line 12—12 in FIG. 11, with parts broken away;

FIG. 13 is a sectional view taken substantially along line 13—13 in FIG. 6;

FIG. 14 is a sectional view taken substantially along line 14—14 in FIG. 6; and

FIG. 15 is an exploded view corresponding to FIG. 6, showing the component parts of a front gripping and gauging mechanism constructed according to the principles of the instant invention, in unassembled but aligned relationship, with parts being broken away and parts shown partly in section.

As a preferred or exemplary embodiment of the instant invention, FIG. 1 illustrates apparatus for feeding and gauging sheets A of tinplate or other sheet material in a sheet printing machine such as a lithographic press. It will be understood, however, that the instant invention is applicable to many other types of sheet treating machines, including cutting machines such as a shear or slitter, or any other similar machine which is used, for example, to treat or prepare the sheets prior to their conversion into container parts.

The sheets A are advanced continuously along a slightly downwardly inclined, or horizontal (not shown), straight line path of travel by a pair of spaced and parallel endless chain conveyors 20 (FIGS. 1 and 2) having feed dogs 22 secured thereto at spaced intervals along their lengths for engaging the back or rear transverse edges of the sheets A. During this travel the sheets A are supported on a plurality of longitudinal support bars 24 which are disposed adjacent the path of travel of the conveyors 20. These support bars are secured to a cross bar 26 which extends transversely of the machine and has its ends attached to a pair of side frames 28, 29 which constitute the main frame of the machine.

The chain conveyors 20 operate over a pair of front driving sprockets 30 mounted on a sprocket shaft 32

journaled in bearings 34 formed in the machine frame, and over a pair of rear idler sprockets (not shown). These conveyors are operated continuously, preferably by an endless chain 35 (FIG. 1) which operates over a driven sprocket 36 on the sprocket shaft 32 and over a driving sprocket 38 mounted on the main drive shaft 40. The main drive shaft 40 is journaled in bearings 42 formed in the machine frame and is driven in any suitable manner.

In the illustrated example of the instant invention, the conveyors 20 feed the sheets A toward a pair of printing cylinders comprising an upper or transfer cylinder 44 (FIG. 2) and a lower or impression cylinder 46 which are in peripheral engagement and between which each sheet A passes for a lithographing operation. The cylinders 44, 46 are mounted in the machine frame in a manner similar to that shown, for example, in the patent to Pechy 2,529,513, issued November 14, 1950, and are rotated in unison in any suitable manner at a peripheral speed which is substantially equal to or slightly greater than the lineal speed of the conveyors 20. For this purpose, the impression cylinder 46 is mounted on the main drive shaft 40, and the cylinders are driven so as to make one revolution for each sheet A.

The impression cylinder 46 is provided with a longitudinal recess 48 within which are mounted a plurality of front gauging and gripping mechanisms 50 which function to gauge the leading edge of each sheet A and to clamp the sheet against the impression cylinder 46 prior to the passage of the sheet between the bite of the cylinders 44, 46. Each of the gauging and gripping mechanisms 50 is identical and generally comprises a gauge block 52, a gauge plate 54 which is laterally slideable with respect to the block 52, and a gripping plate 56 which is pivotally mounted for oscillatory movement with respect to the block 52 (see FIGS. 2, 6, 7, 9, 12, 14 and 15). The gauge block 52 has two longitudinally extending hubs 53 which are mounted on a hollow shaft 58 which is in turn rotatably mounted on brackets 60 that are integral with or rigidly attached to a base plate 62 extending laterally in the cylinder recess 48 and rigidly attached to the impression cylinder 46. A pin or key 64 extending through the shaft 58 and one of the hubs 53 retains the gauge block 52 in predetermined position on the shaft 58 so that the gauge block 52 is rotatable therewith.

The front end of the gripping plate 56 is split and the plate 56 has a narrow longitudinally extending hub 66 (FIGS. 7 and 11 through 13) which is rotatably mounted on the shaft 58 between the hubs 53 of the gauge block 52 so as to provide for relative movement between the gauge block 52 and the gripping plate 56. The gauge block 52 is provided with a longitudinal bore 68 within which a pin 70 having a wedge tip 72 is slideably mounted. A transverse bore 74 is provided in the gripping plate 56 and a pin 76 which is partially threaded at one end is rigidly retained in the bore 74 by a nut 75. The other end of the pin 76 comprises a wedge 78 which is in complementary engagement with the wedge tip 72 so that relative movement between the wedges 72 and 78 results in oscillatory movement of the gripping plate 56 about the shaft 58 and toward or away from the gauge block 52. The gripping plate 56 is normally biased toward the gauge block 52 (or in a clockwise direction as viewed in FIGS. 6, 12 and 15) by a coil spring 80 which surrounds a shaft 82 rigidly attached to the gripping plate 56, the spring 80 being compressed between a recessed surface 84 in the gauge block 52 and a washer or disk 86 retained on the lower threaded end of the shaft 82 by a nut 88.

A cam shaft 90 is slideably mounted for axial movement within the hollow, rotatable shaft 58 and has a plurality of cam surfaces 92 thereon corresponding to the number of gauging and gripping mechanisms 50 (FIGS. 7, 11 and 12). Each cam surface 92 is located adjacent the bore 68 in one of the gauge blocks 52, and the pin 70 in the bore 68 is in contact with the cam surface 92 so as to be moved thereby when there is axial movement of the cam shaft 90. A coil spring 94 is provided within the hollow shaft 58 and is in contact with one end of the cam shaft 90 to urge it laterally, as shown in FIG. 7, so that each pin 70 rests on the high portion of the corresponding cam surface 92. When the pins 70 are in this position, each gripping plate pin 76 is held in its highest position and thus each gripping plate 56 occupies an open position with respect to the corresponding gauge block 52.

The other end of the cam shaft 90 has a U-shaped bracket 96 formed integral therewith or rigidly attached thereto (see FIGS. 1, 3 and 11). Between the legs of the bracket 96 there is rotatably mounted a cam roller 98 which is positioned to contact a stationary cam segment 100 for a portion of each revolution of the impression cylinder 46. When the roller 98 contacts the cam segment 100, the cam shaft 90 is moved laterally, as seen in FIG. 11, against the force of the spring 94 to bring the low portion of each cam surface 92 into engagement with the corresponding pin 70. This enables the pin 70 to be slid towards the cam shaft 90 (to the left as seen in FIG. 12) by the wedge 78 of the gripping plate pin 76 under the pressure of the spring 80, thus permitting the gripping plate 56 to be rotated in a clockwise direction toward the gauge block 52 by the force of the sring 80. The axial movement of the cam shaft 90, therefore, controls the movement of the gripping plate 56 with respect to the gauge block 52.

The gauge plate 54 is slideably mounted on a shaft 104 (FIGS. 12 through 15) for movement in a direction transverse to the longitudinal movement of the sheets A. The shaft 104 extends through a bore 106 in the gauge plate 54 and has its ends anchored in a bearing member 108 (see FIG. 14) which surrounds and is spaced from the gauge plate 54 and which is rigidly mounted on the gauge block 52. The surfaces of both the shaft 104 and the bore 106 are highly polished and well lubricated to insure easy lateral movement of the gauge plate 54 on the shaft 104. An anti-friction roller bearing 110 of any suitable construction is mounted on the lower portion of the bearing member 108 and is disposed within a lateral groove in the bottom of the gauge plate 54 to function as a key to hold the gauge plate 54 in position relative to the gauge block 52 at all times with a minimum of friction.

A front gauge member 112 is bolted or otherwise rigidly mounted on the upper portion of the gauge plate 54 and extends forwardly (to the right, as seen in FIG. 15) of the front curved surface 114 on the gauge plate 54. The gauge member 112 is disposed between the fingers 116 of a gripping member 118 which is bolted or otherwise rigidly attached to the gripping plate 56. As seen in FIG. 14, the lateral movement of the gauge plate 54 is controlled by the lateral spacing between the upper portion thereof and the split front end of the gripping plate 56, and by the lateral spacing between the gauge plate 54 and the bearing member 108. This spacing between the gauge plate 54, gripping plate 56 and bearing member 108 is equal to or more than the maximum estimated lateral or transverse movement of the sheets A during the side gauging thereof. Thus, each gauge plate 54 is adapted to move laterally with the sheets A during the side gauging operation, and, since each gauge plate 54 slides easily on its shaft 104 for easy lateral movement, there is a minimum of frictional resistance to the lateral movement of the sheet A during the side gauging operation. The minimum of friction between each gauge plate groove and its antifriction bearing 110 contributes to the easy lateral movement of the gauge plates 54.

In order to return each of the gauge plates 54 to a neutral position (FIG. 14) after each sheet A is side gauged, two laterally extending pins 120 are rigidly attached to

the upper portion of each gauge plate 54 (FIGS. 7 through 9). A plurality of curved guide rails 122 (FIGS. 1, 2 and 10), corresponding in number and longitudinally aligned with the gauge plates 54, are rigidly mounted on a transversely extending bracket 124 which is secured to the cross bar 26. Each guide rail 122 is of a width sufficient to slideably receive the ends of the pins 120 on the corresponding gauge plate 54, and the lower portion 121 of each guide rail 122 is flared outwardly (FIG. 10) to a sufficient degree to receive the pins 120 when the corresponding gauge 54 is moved out of its neutral position. After the side gauging of each sheet A, each gauge plate 54 is moved from its neutral position a distance equal to the lateral movement of the sheet A. The gauge plate 54 then continues to rotate with the impression cylinder 46 and the pins 120 enter the corresponding guide rail 122 to laterally slide the gauge plate 54 to its neutral position prior to the gauging of the next sheet A.

The side gauging of the sheets A is effected by a fixed side registering stop or roller 124 (FIG. 1) which is secured to the side frame 28 adjacent one side edge of the sheet A, and a sheet moving element or roller 126 which is disposed adjacent the opposite side edge of the sheet A (at the right as viewed in FIG. 1). The sheet moving roller 126 is mounted on the inner end of a horizontally disposed plate 128 (FIGS. 1 and 2) which is slideably mounted in the slideway 130 of a support member 132 rigidly mounted on the side frame 29. The outer end of the slideable plate 128 supports a cam roller 134 which is disposed in the track 136 of a rotatable cam member 138. The cam member 138 is rotatably supported by the side frame 29 and is rotated at a peripheral speed equal to that of the impression cylinder 46 by the main drive shaft 40 through a pair of gears 140, 142. A portion 144 of the cam track 136 is curved inwardly (see FIG. 1) so that the sheet moving roller 126 is moved into engagement with the sheet A when the latter is in the position shown in FIG. 1, wherein the leading edge thereof is in contact with the gauge plates 54.

In order to provide for a predetermined rotation of the front gauging and gripping mechanisms 50 with respect to the impression cylinder 46 as the latter is rotating, and to maintain these mechanims in operating position relative to the advancing sheets A, the rotatable shaft 58 upon which the mechanisms 50 are mounted has rigidly attached thereto an end bracket 146 which carries a cam roller 148 (FIGS. 1 through 4). The cam roller 148 is disposed in a cam track 150 of a stationary guide member 152 which is rigidly attached to the side frame 29, so that each of the gauging and gripping mechanisms 50, as it rotates with the impression cylinder 46, assumes the positions partially shown in broken lines in FIG. 2 and engages the leading edges of the sheets A as they are advanced along the support bars 24.

The front gauging of each sheet A is effected by a feed finger mechanism 153 comprising a pusher or feed finger 154 (FIGS. 1 and 2) which rotates into and out of the path of travel of a sheet A being advanced by the conveyors 20 to temporarily engage the rear edge of the sheet A, accelerate it away from the conveyor feed dogs 22, and push it into a front-to-back gauged position with its leading edge engaging the gauge plates 54. Since the specific construction of the feed finger mechanism 153 forms no part of the instant invention, it is only generally disclosed herein, the construction and operation thereof being substantially the same as the feed finger mechanism disclosed in the patent to Nordquist 2,811,355, issued October 29, 1957.

Except for the period during which it is accelerated, the feed finger 154 is rotated with the sprocket shaft 32 at a peripheral speed substantially equal to the lineal speed of the conveyors 20. The feed finger 154 is mounted on a lever 156 in a manner which permits lateral movement of the finger 154 relative to its direction of rotation, i.e., the feeding direction. For this purpose, the finger 154 is mounted on an antifriction bearing 158 which in turn is mounted on a pin (not shown) secured in the lever 156 at right angles to the trunnions 160. A torsion spring 162 on one of the trunnions 160 yieldably urges the feed finger 154 in the feeding dirction. In order to retain the feed finger 154 in a normal position perpendicular to the trunnions 160 during a major portion of its rotation with the sprocket shaft 32, a pair of spaced and parallel stationary guide rails or rings 164 are provided, one on each side of the finger 154 and extending entirely around its path of rotation. Adjacent the conveyors 20 where the finger 154 engages the rear edge of each advancing sheet A, the guide rings 164 are formed with laterally extending recesses 166 (FIG. 1) to free the finger 154 for lateral movement at this point in its path of rotation.

In the operation of the instant apparatus, a sheet A is advanced toward the cylinders 44, 46 by the feed dogs 22 of the conveyors 20 at a lineal speed substantially the same as the peripheral speed of the cylinders 44, 46, as hereinbefore mentioned. As the rear edge of the advancing sheet A approaches the conveyor sprocket shaft 32, the feed finger 154 rotates upwardly behind the sheet edge and yieldably engages it, as shown in FIGS. 1 and 2. The finger 154 then is rocked forwardly to give it accelerated speed, which advances the sheet A ahead of the feed dogs 22 on the conveyors 20 and toward the front gauging and gripping mechanisms 50.

At this point, the cam roller 134 on the slideable plate 128 supporting the sheet moving roller 126 has not yet reached the inwardly curved portion 144 of the track 136 in the rotating cam member 138, with the result that the sheet moving roller 126 is held out of contact with the side of the sheet A. Also, the cam roller 98 on the slideable cam shaft 90 is out of contact with the stationary cam segment 100 so that the spring 94 urges the cam shaft 90 to the position shown in FIG. 7, wherein the slideable pins 70 are in engagement with the high portions of the cam surfaces 92 on the cam shaft 90, and the gripping plate 56 is thus maintained in an open position against the force of the coil spring 80. During this same period of operation, the pins 120 on the slideable gauge plate 54 are disposed within the guide rails 122 so that each gauge plate 54 is in its neutral position prior to its engagement with the leading edge of the sheet A.

The sheet A is advanced by the feed finger 154 until its leading edge engages the front curved surface 114 of the gauge plate 54 and is wedged upwardly against the front gauge member 112, at which point the finger 154 remains in yielding contact with the rear edge of the sheet A under the force of the torsion spring 162. The rotation of the front gauging and gripping mechanisms 50 with the impression cylinder 46, and the independent rotation of the mechanisms 50 produced by the cam roller 148 which is disposed in the cam track 150 of the guide member 152 (FIGS. 1 through 4), are timed so that each gauging and gripping mechanism 50 is rotated into the path of the sheet A as the leading edge thereof is adjacent to the upper portion of each of the guide rails 122.

As shown in FIGS. 1 and 5, during the front gauging operation the leading edge of the sheet A is wedged between the front curved surface 114 of the gauge plate 54 and the lower surface of the front gauge member 112 which protudes beyond the curved surface 114. Since the cam roller 98 is not yet in contact with the stationary cam segment 100, the gripping plate 56 is maintained in an open position and the fingers 116 of the gripping member 118 are disposed above the gauge member 112 and out of contact with the sheet A (see FIG. 5).

Substantially simultaneously with this front gauging operation, the cam roller 134 on the slideable plate 128 enters the inwardly curved portion 144 of the track 136 in the rotating cam member 138 to move the sheet moving roller 126 inwardly into contact with the side of the sheet A. The roller 126 pushes the sheet A transversely into contact with the oppositely disposed stationary roller

124 to accurately side gauge the sheet A, as shown in FIG. 1. During this side gauging, the leading edge of the sheet A is in engagement with the gauge plates 54 and the gauge members 112, and the rear edge of the sheet A is in engagement with the feed finger 154. There is, however, a minimum of frictional resistance to the transverse or lateral movement of the sheet A during side gauging, because each of the gauge plates 54 is laterally slideable a distance equal to or greater than the maximum estimated lateral movement of each sheet A during side gauging, and additionally, because the feed finger 154 is mounted on the lever 156 for lateral movement between the recesses 166 in the guide rings 164. The lateral movement of the sheet A during this side gauging operation is shown herein as being relatively small. This is so because the sheet A is normally roughly pre-gauged laterally in any suitable manner prior to this final and precise side gauging operation.

While the sheet A is held accurately gauged by the sheet moving roller 126 and the yieldable feed finger 154, the cam roller 98 on the slideable cam shaft 90 contacts the stationary cam segment 100 to axially slide the shaft 90 against the force of the spring 94 to the position shown in FIG. 11, wherein the slideable pins 70 are in engagement with the low portions of the cam surfaces 92. Each of the gripping plates 56 is thus urged to a closed position by its respective coil spring 80 so that the leading portion of the sheet A is firmly clamped by the fingers 116 of the gripping members 118 against an anvil insert 168 mounted in the recess 48 of the impression cylinder 46 (see FIGS. 2, 3, 5*a*, 6 and 12). The clamped and gauged sheet A then passes into the bite of the cylinders 44, 46 for passage therebetween for the lithographing or other operation.

As soon as the sheet A is in the grip of the cylinders 44, 46, the sheet moving roller 126 is pulled away from the side edge of the sheet by the outward movement of the plate 128 caused by the movement of the cam roller 134 out of the inwardly curved portion 144 of the cam track 136 in the rotating cam member 138. Also, the gripper fingers 116 are released from the sheet A by the upward movement or counterclockwise rotation of the gripping plates 56, effected by the movement of the cam roller 98 away from the stationary cam segment 100, which results in the axial movement of the cam shaft 90 by the spring 94 and the engagement of the pins 70 with the high portions of the cam surfaces 92. The rotation of the impression cylinder 46, plus the shape of the cam groove 150, thereafter disengages the gauging mechanisms 50 from the front edge of the sheet A. As the released leading portion of the sheet A passes beyond the cylinders 44, 46, it rides onto support rails (not shown) or other suitable means to support the sheets as they pass through the cylinders. Thereafter, the rotation of the impression cylinder 46 causes the pins 120 to enter the guide rails 122 to reset the gauge plates 54 in neutral position for the succeeding gauging cycle. This completes the cycle of operation of the instant apparatus.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. Apparatus for feeding and gauging a sheet comprising means for feeding said sheet along a predetermined path of travel, front gauging means disposed in said path of travel and being freely movable in a direction transversely thereof, and side gauging means mounted adjacent the sides of said sheet to move it in a direction transverse to the feeding direction when the leading edge of said sheet is in frictional engagement with said front gauging means, whereby when said sheet is moved in said direction transverse to the feeding direction by said side gauging means, said front gauging means is moved in said transverse direction by said sheet.

2. The apparatus of claim 1 wherein said front gauging means is transversely movable a distance which is at least equal to the maximum transverse movement of said sheet by said side gauging means.

3. The apparatus of claim 1 wherein gripping means are associated with said front gauging means for clamping said sheet after said sheet is gauged by said front and said side gauging means.

4. Apparatus for feeding and gauging a sheet to be advanced onto a rotating means for performing a predetermined operation on said sheet, comprising means in engagement with the rear edge of said sheet for feeding it to said rotating means, front gauging and gripping means mounted on said rotating means and comprising a gripping member which is rotatably mounted for oscillatory movement toward and away from said rotating means and a gauging member which is freely movable in a direction transverse to the sheet feeding direction, and side gauging means mounted adjacent the sides of said sheet to move it in a direction transverse to the feeding direction when the leading edge of said sheet is in frictional engagement with said front gauging member, whereby when said sheet is moved in said direction transverse to the feeding direction, said gauging member is moved in said transverse direction by said sheet.

5. The apparatus of claim 4 wherein said sheet feeding means is freely movable in a direction transverse to the feeding direction, and wherein said sheet feeding means is maintained in yieldable engagement with the rear edge of said sheet during the front and side gauging thereof.

6. The apparatus of claim 4 wherein means are provided for controlling the rotation of said gripping member so that it clamps the leading portion of said sheet against said rotating means after said sheet is gauged by said front gauging member and said side gauging means.

7. Apparatus for feeding and gauging a sheet to be advanced along a supporting means onto a rotating cylinder, comprising means in engagement with the rear edge of said sheet for advancing it toward said rotating cylinder at a lineal speed substantially the same as the peripheral speed of said rotating cylinder, a front gauging and gripping mechanism rotatably mounted on said rotating cylinder and comprising a gripping member which is independently rotatable towards and away from said cylinder and a gauging member which is freely slidable in a direction transverse to the sheet feeding direction, and side gauging means mounted adjacent the sides of said sheet and operable to move it in a direction transverse to the feeding direction when the leading edge of said sheet is advanced into frictional engagement with said front gauging member, whereby when said sheet is moved in said direction transverse to the sheet feeding direction, said gauging member is moved in said transverse direction by said sheet.

8. The apparatus of claim 7 wherein said front gauging member is transversely slideable from a neutral position a distance which is at least equal to the maximum transverse movement of said sheet by said side gauging means.

9. The apparatus of claim 8 wherein means is provided for returning said front gauging member to the neutral position after it is moved transveresly with said sheet during the side gauging thereof.

10. The apparatus of claim 7 wherein a hollow shaft is rotatably mounted on said rotating cylinder, and wherein a gauge block is rigidly mounted on said hollow shaft for rotation therewith, said gripping member being rotatably mounted on said hollow shaft for oscillatory movement relative to said gauge block and said gauge

member being slideably mounted on said gauge block for transverse movement relative thereto.

11. The apparatus of claim **10** wherein there is provided a cam shaft slideably mounted in said hollow shaft, means for sliding said cam shaft within said hollow shaft at predetermined times, and means responsive to the sliding of said cam shaft for rotating said gripping member toward and away from said gauge block and said rotating cylinder.

12. In apparatus for gauging a sheet which is advancing in a predetermined direction, a front gauging member which is engageable with the leading edge of said sheet and is freely movable in a direction transverse to said predetermined direction, and means for side gauging said sheet in a transverse direction when the leading edge thereof is in contact with said front gauging member, whereby said front gauging member is moved transversely by said sheet during the side gauging thereof.

13. The apparatus of claim **12** wherein there is provided a front gripping member for gripping the leading portion of said sheet when the latter is in a predetermined gauged position.

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