Oct. 15, 1957 R. E. J. NORDQUIST 2,809,831

SHEET FEEDING AND GAUGING MECHANISM

Filed Nov. 10, 1954 4 Sheets-Sheet 1

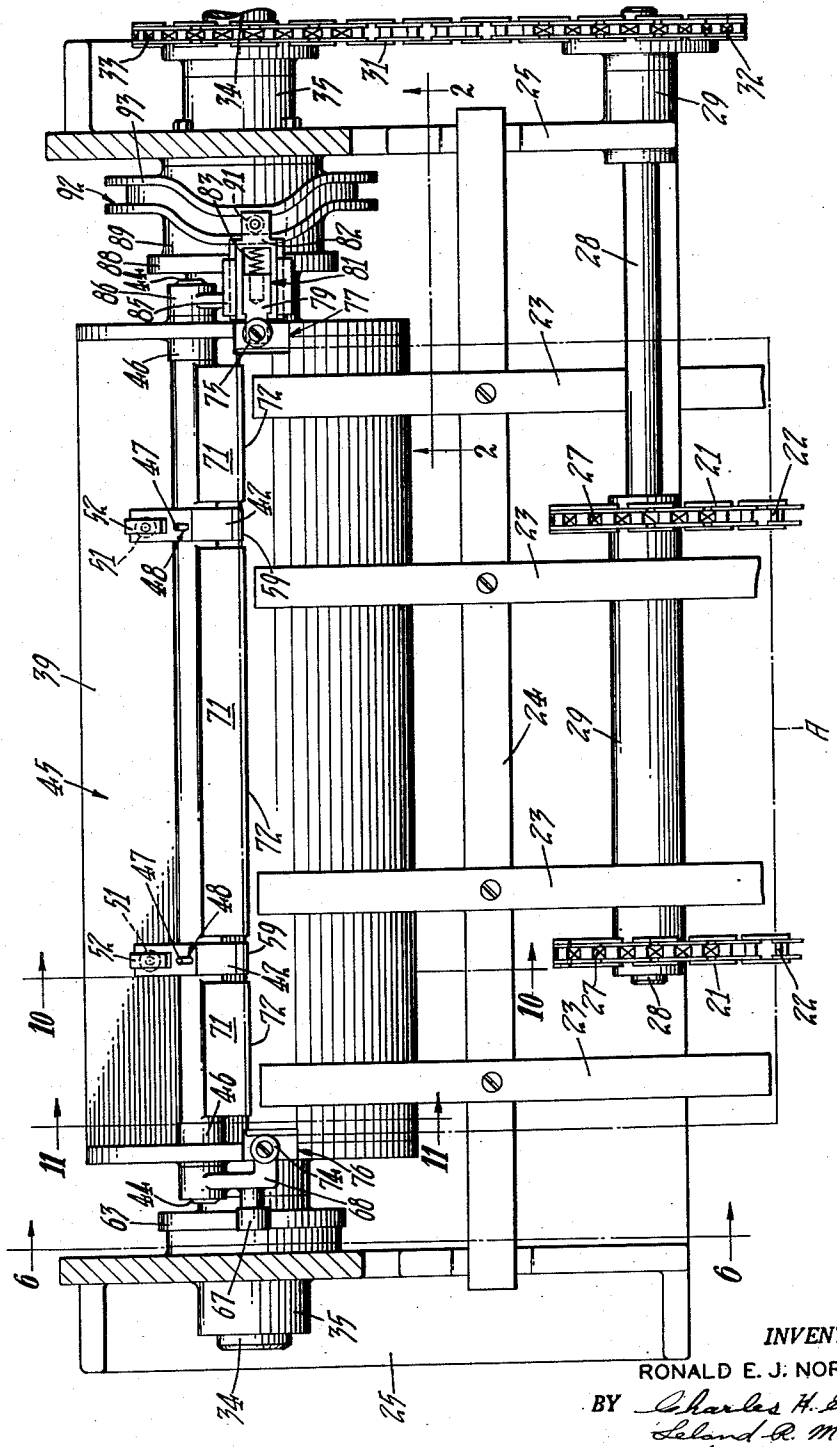


FIG. 1

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SHEET FEEDING AND GAUGING MECHANISM

Filed Nov. 10, 1954 4 Sheets-Sheet 2

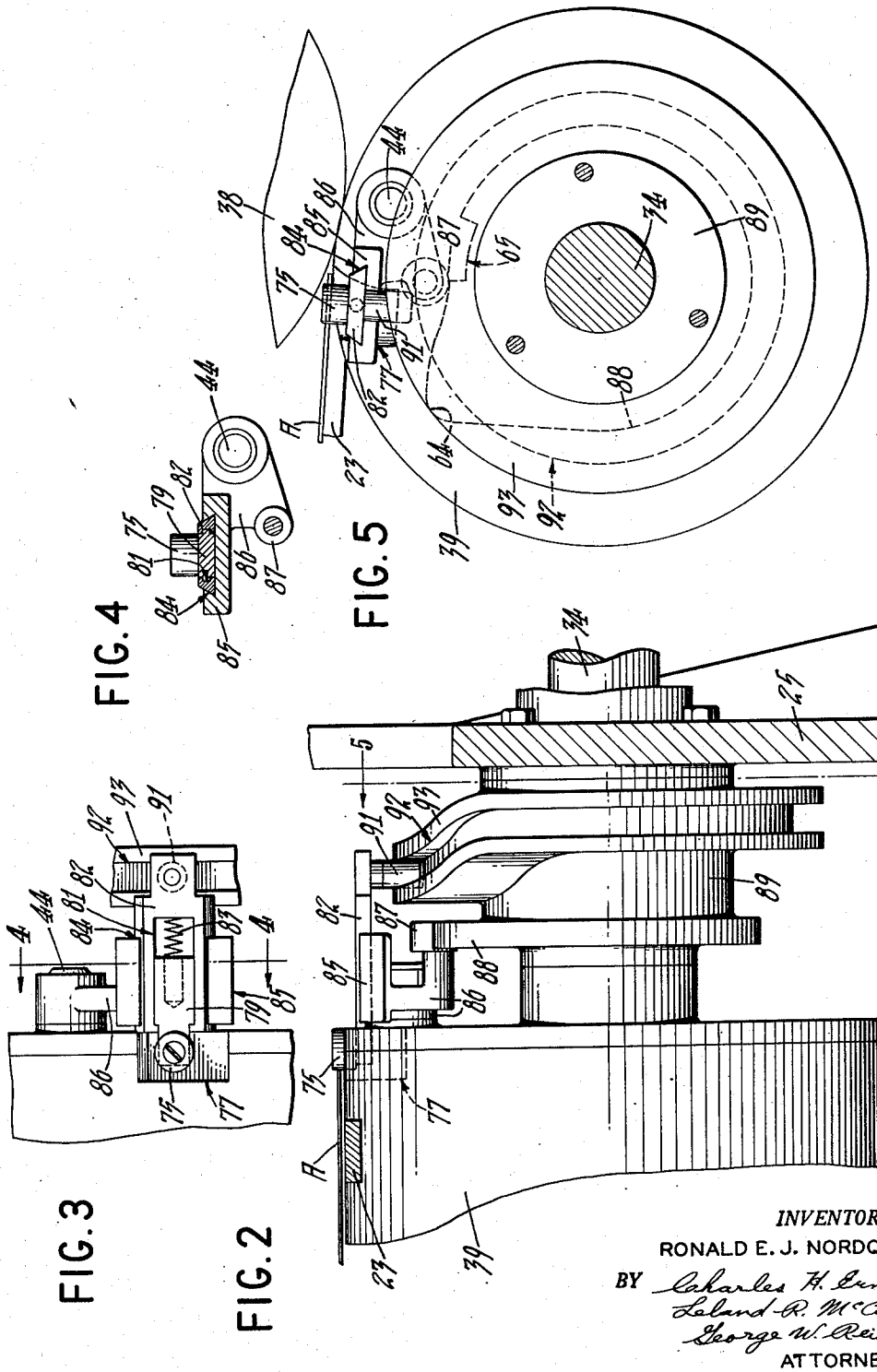


FIG. 2

FIG. 3

FIG. 4

FIG. 5

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SHEET FEEDING AND GAUGING MECHANISM

Filed Nov. 10, 1954 4 Sheets-Sheet 3

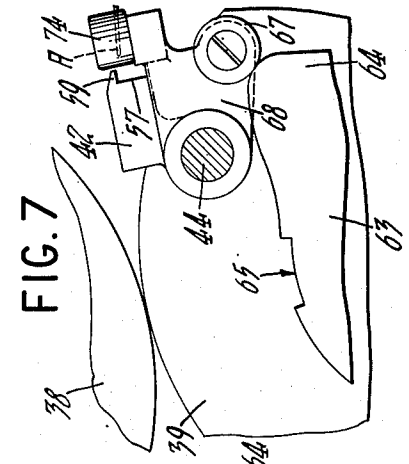


FIG. 7

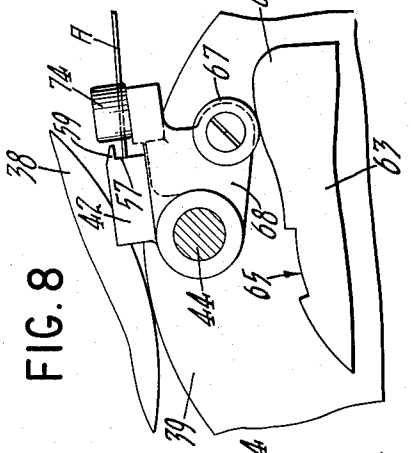


FIG. 8

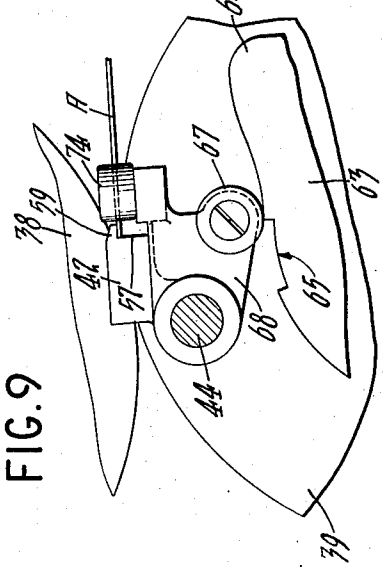


FIG. 9

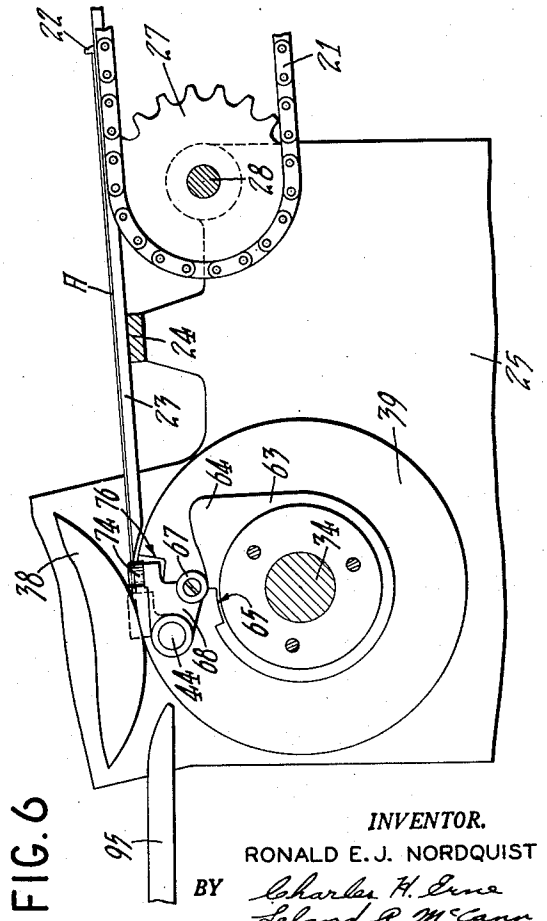


FIG. 6

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SHEET FEEDING AND GAUGING MECHANISM

Filed Nov. 10, 1954 4 Sheets-Sheet 4

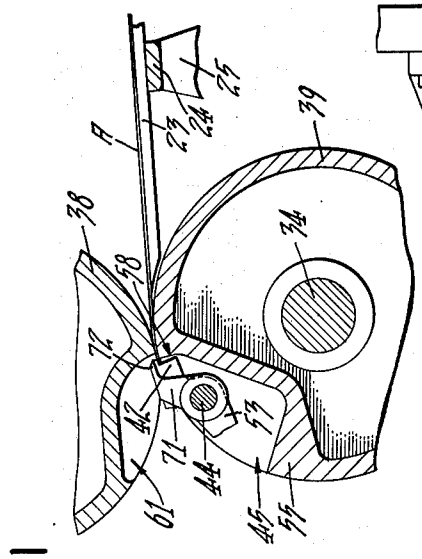


FIG. 11

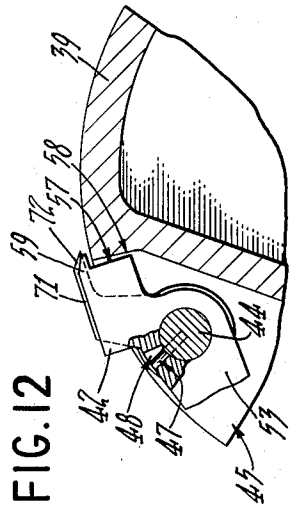


FIG. 12

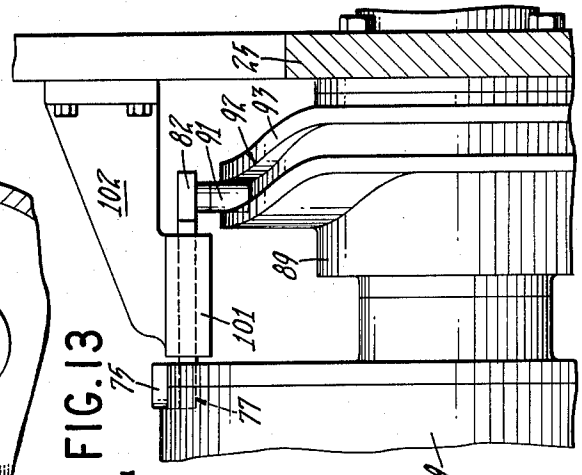


FIG. 13

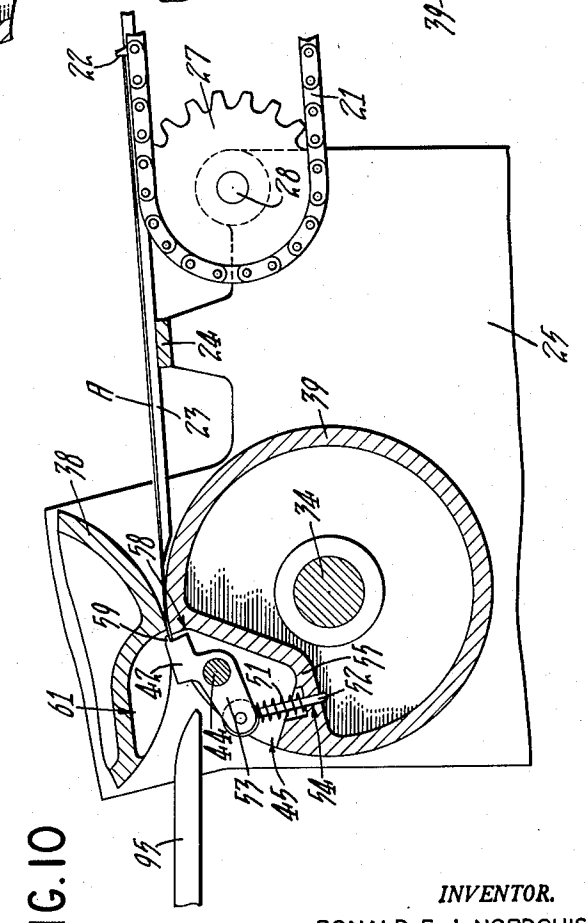


FIG. 10

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United States Patent Office 2,809,831 Patented Oct. 15, 1957

2,809,831

SHEET FEEDING AND GAUGING MECHANISM

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Application November 10, 1954, Serial No. 468,070

18 Claims. (Cl. 271—48)

The present invention relates to a sheet feeding and gauging mechanism for sheet treating machines such as lithographic machines and the like where sheets of tin plate and other relatively stiff materials are required to be located in an accurate predetermined position for proper treatment and has particular reference to devices for gauging the sheets without buckling them to obtain precise positioning.

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 predetermined position and in cutting or other machines where an operation or a series of operations are performed on predetermined portions of the sheet material, it is important to accurately square up the material with reference to one or more edge or edges so that the impressions or operations on the material will be received or effected in definite locations on the material.

In side gauging such sheet material, the sheet usually is engaged at points well beyond the end edges, often near the middle of the sheet, to compensate for greatly out of square side edges. Where the sheets are fairly flexible due to their transverse dimensions considerable difficulty is experienced in adjusting the pressure of the gauges against the edges of the sheets to overcome undue buckling of the sheets. It has been found that any buckling of the sheet during gauging affects the accuracy of the gauging and often results in improper location of the sheet to be operated upon.

The instant invention contemplates overcoming these difficulties by providing devices which hold the sheet against buckling while it is being gauged.

An object of the invention is the provision in a lithographing machine or the like of feeding and gauging devices wherein the sheet to be operated upon is gauged immediately adjacent its leading edge while the marginal portion adjacent this edge is confined to hold this portion flat and thereby prevent buckling of the sheet and inaccurate gauging.

Another object is the provision of such devices wherein an increased pressure on the side edges of the sheets being gauged may be employed to insure adequate shifting of the sheets into a properly gauged position without buckling the sheets.

Another object is the provision of such devices wherein the gripper fingers which grip a sheet for passage through the machine after it is gauged are pressure actuated independently of each other so that a tight gripping of the sheet may be had regardless of variations in the thickness of the sheet or torque in the actuating means.

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.

Referring to the drawings:

Fig. 1 is a top plan view of a portion of a lithographic machine embodying the instant invention, with parts broken away;

Fig. 2 is an enlarged sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a fragmentary top plan view of the devices shown in Fig. 2;

Fig. 4 is a sectional detail taken substantially along the line 4—4 in Fig. 3;

Fig. 5 is a sectional end view taken substantially along the line 5—5 in Fig. 2, with parts broken away;

Fig. 6 is a sectional view taken substantially along the line 6—6 in Fig. 1, with parts broken away;

Figs. 7, 8 and 9 are fragmentary views of certain of the movable parts in Fig. 6 and showing the parts in different positions;

Figs. 10 and 11 are sectional views taken substantially along the lines 10—10, 11—11, in Fig. 1, with parts broken away;

Fig. 12 is an enlarged view of a fragmentary portion of Fig. 11, showing certain of the parts in greater detail; and

Fig. 13 is a view similar to Fig. 2 showing a modified form of the invention.

As a preferred or exemplary embodiment of the invention the drawings illustrate principal parts of a lithographing machine of the character disclosed in United States Patent 2,529,513 issued November 14, 1950 to W. Pechy, including a sheet feeding and gauging mechanism for feeding and gauging sheets A (Fig. 1) of tin plate or the like sheet material and for advancing them into a sheet treating machine such as a printing or lithographing machine, scroll shear, slitter or other machine used for preparing or converting the sheets into container or can parts.

In such a machine the sheets A are advanced continuously along a slightly downwardly inclined straight line path of travel by a pair of spaced and parallel endless chain conveyors 21 (Figs. 1, 6 and 10) having feed dogs 22 secured thereto at spaced intervals along their lengths for engaging the back or rear transverse edges of the sheets. During this travel the sheets are supported on a plurality of longitudinal support bars 23 which are disposed adjacent the path of travel of the conveyors 21. These support bars 23 are secured to a cross bar 24 which extends transversely of the machine and has its ends attached to a pair of side frames 25 which constitute the main frame of the machine.

The chain conveyors 21 operate over a pair of driving sprockets 27 mounted on a sprocket shaft 28 journaled in bearings 29 formed in the machine frame. These conveyors 21 are operated continuously, preferably by an endless chain 31 (Fig. 1) which operates over a sprocket 32 on the sprocket shaft 28 and over a driving sprocket 33 mounted on a main drive shaft 34. The main drive shaft 34 is journaled in bearings 35 formed in the machine frame. The shaft is driven in any suitable manner.

The conveyors 21 are utilized to feed a sheet A to a place or station immediately adjacent the subsequent operation or treating machine and at this station and while the sheet is continuously moving forward, it is gauged for proper location and alignment and is immediately advanced into the treating machine while so gauged. In the lithographing machine illustrated in the drawings, the leading edge of the sheet is fed into position between an upper or transfer cylinder 38 and a lower or impression cylinder 39 for passage of the sheet between them for a printing or lithographing operation. The cylinders 38, 39 are mounted in the machine frame as shown in the Pechy Patent 2,529,513 and are rotated in unison in any suitable manner at a peripheral speed of travel substantially equal

to the lineal travel of the conveyors 21. The cylinders make one revolution for each sheet A.

The lower or impression cylinder 39 is mounted on the main drive shaft 34. This cylinder 39 carries a pair of gripper fingers 42 (Figs. 1 and 10) for initially gripping the leading edge of a gauged sheet A by clamping this edge and the adjacent marginal portion against the outer face of the cylinder 39 until the sheet advances into position between the cylinders.

The gripper fingers 42 are mounted on a gripper shaft 44 (Figs. 10 to 12) which extends longitudinally of the impression cylinder 39 in a recess 45 formed in the cylinder, the ends of the shaft being journaled for oscillation in bearings 46 (Fig. 1) formed in the ends of the cylinder. Each of the gripper fingers 42 is keyed to the gripper shaft 44 by a pin 47 (Fig. 12) which is secured in the shaft and which projects radially into an elongated slot 48 formed in each finger so that both fingers have limited oscillating movement relative to the shaft.

The gripper fingers 42 are yieldably held in engagement with the pins 47 by compression springs 51 (Fig. 10) which surround guiding shanks 52 which at their upper ends are pivotally connected to lever arms 53 formed on the fingers. The lower ends of the shanks 52 are disposed in apertures 54 formed in a web 55 which partially defines the recess 45 in the cylinder. The springs 51 are interposed between the lever arms 53 and the web 55 and thus tend to rotate the gripper fingers 42 in a clockwise direction on the shaft 44 as viewed in Fig. 10.

The forward edge of each of the gripper fingers 42 is formed with a substantially straight front gauging face 57 (Fig. 12) which is disposed closely adjacent a wall section 58 which is formed in the cylinder 39 and which partially defines the recess 45. At its outer edge this gauging face 57 merges into a forwardly projecting gripper tongue 59 which projects forwardly of the gauging face 57 and overhangs the outer surface of the impression cylinder 39 adjacent the wall section 58. The gauging faces 57 of the gripper fingers 42 are utilized to front gauge the leading edge of a sheet A fed into the cylinders 38, 39 while the gripper tongues 59 are utilized to clamp the gauged sheet in place against the impression cylinder until the sheet is carried into position between the cylinders. A longitudinal clearance recess 61 (Fig. 10) is provided in the upper or transfer cylinder 38 to clear the gripper fingers 42.

The gripper fingers 42 are held normally in the position shown in Fig. 12 with their gripper tongues 59 in spaced relation to the outer surface of the impression cylinder 39 during gauging and reception of the leading edge of a sheet A and are rocked clockwise (as viewed in Fig. 12) into sheet clamping position by a stationary edge cam 63 (Figs. 1 and 6) which is disposed adjacent one end of the impression cylinder 39 and which surrounds the cylinder shaft 34. The cam 63 is secured to the machine frame 25. The cam 63 for its major portion is concentric with the shaft 34 to hold the gripper fingers 42 in inoperative normal position as explained above and is formed with a high portion 64 which opens and closes the fingers to receive and clamp a sheet. Adjacent the high portion the cam edge is formed with a recess 65 which releases the fingers 42 to permit the springs 51 to fully clamp the fingers against the sheet edge. The rocking of the fingers 42 by this cam 63 is effected by a cam roller 67 which rides on the cam and which is carried on an arm 68 mounted on and secured to the gripper shaft 44. The springs 51 hold the roller 67 in engagement with the cam 63.

The gripper shaft 44 also carries a plurality of anti-buckling elements 71 (Figs. 11 and 12) which prevent buckling of a sheet during the gauging operation. These elements 71 are elongated fingers (see Fig. 1) which are disposed adjacent and on opposite sides of the gripper fingers 42 and are provided with noses 72 (Fig. 12) which overhang the outer surface of the impression cylinder 39 adjacent the recess wall section 58. The bottom or under face of the noses 72 are straight and are disposed slightly beyond (or above), in an outward direction, the clamping faces of the gripper tongues 59 so as to receive, overhang and confine the leading marginal edge portion of the sheet as it is fed to the impression cylinder 39 to prevent buckling of this edge during the side gauging of the sheet. These fingers 71 extend longitudinally of the impression cylinder 39 for nearly its full length as shown in Fig. 1.

The side gauging of the sheet A as it is being fed to the impression cylinder is effected by a side registering stop or roller 74 (Fig. 1) disposed adjacent one side edge of the sheet (at the left as viewed in Fig. 1) and a sheet moving element or roller 75 disposed adjacent the opposite side edge of the sheet (at the right as viewed in Fig. 1). The side registering stop 74 rotates with the impression cylinder 39 and for this purpose is mounted on the cam arm 68 which is actuated by the edge cam 63. The rocking of the cam arm 68 moves the stop 74 vertically into and out of sheet gauging position. The stop 74 is located in a position on a level with the clamping tongues 59 of the gripper fingers 42 as best shown in Figs. 6 through 9, and is disposed in a transverse line with and closely adjacent the gripper fingers 42, so as to be engaged by the side edge of a sheet A close to its leading edge (preferably within a range of from one half to one inch of the edge) while the leading edge of the sheet is moving into position under the gripper tongues 59. The side registering stop 74 operates in a clearance recess 76 in the adjacent end of the impression cylinder 39.

In a similar manner, the sheet moving element 75 preferably rotates with the impression cylinder 39 and is disposed directly opposite the registering stop 74 in a clearance recess 77 formed in the adjacent end of the cylinder 39. This sheet moving element or roller 75 preferably is mounted on the inner end of a horizontally disposed plate 79 (Figs. 1, 3 and 4) which is slideably carried in a slideway 81 of a horizontally disposed slide 82 (Fig. 3). The plate 79 is yieldably held in a normal inwardly extending position by a compression spring 83 interposed between the outer end of the plate and the slide 82.

The slide 82 is slideably supported in a slideway 84 which extends substantially parallel with the axis of the impression cylinder 39 and which is formed in a block 85 which is integral with an arm 86 disposed adjacent the end of the impression cylinder 39 and secured to the gripper finger rocker shaft 44. The arm 86 carries a cam roller 87 which operates on an edge cam 88 (see also Figs. 2 and 5) which in contour is similar to the edge cam 63 for the purpose of rocking the sheet moving element or roller 75 vertically relative to its recess 77 into and out of sheet gauging position in the same manner and in time with the sheet stop 74 for the sheet gauging operation. The cam 88 is stationary and is formed on a hub 89 which surrounds the impression cylinder shaft 34 and is attached to the adjacent side frame 25.

The slide 82 is reciprocated horizontally in its slide block 85 as it rotates with the impression cylinder 39 and in time with the feeding of the sheets A to the cylinder. For this purpose the outer end of the slide 82 carries a depending elongated cam roller 91 which operates in a cam groove 92 of a stationary barrel cam 93 formed on the hub 89. As the impression cylinder 39 rotates it carries the slide 82 with it and causes the cam roller 91 to traverse the cam groove 92 and also permits the elongated cam roller to shift radially under the action of the edge cam 88 on the arm 86.

In the operation of the machine, a sheet A as it is being fed toward the cylinders 38, 39 by the feed dogs 22 of the conveyors 21 is advanced in time with the rotation of the cylinders, the lineal speed of the sheet being substantially the same as the peripheral speed of the cylinders as hereinbefore mentioned. The timing is such that as the leading edge of the advancing sheet approaches

the cylinders, the cam rollers **67, 87** on the respective rocker arms **68, 86** rotating with the impression cylinder, ride outwardly on the high portions **64** of the cams as shown in Fig. 7 and thus rock the arms **68, 86** outwardly with the result that the registering stop roller **74** on arm **68** and the sheet moving element or roller **75** on arm **86**, are simultaneously projected upwardly into the horizontal plane of the sheet and in position adjacent and outwardly of the outer edges of the sheet immediately adjacent its leading edge as shown in Fig. 7. It should be noted that as shown in Fig. 7, this action takes place quite close to the point of engagement between the cylinders **38, 39**. This same rocking action rocks the gripper shaft **44** and thus raises the gripper fingers **42** and the anti-buckling elements **71** to a position above the leading edge of the sheet as shown in Fig. 7.

As a sheet A continues to advance toward the rotating cylinders **38, 39** the side gauge stop roller **74** and the sheet moving element **75** are maintained in the same horizontal plane of the sheet but they advance with the sheet. During this period, the leading edge of the sheet engages with the front gauging faces **57** of both of the gripper fingers **42** as shown in Fig. 8, and this properly aligns or squares the sheet relative to its front edge. This is effected by the conveyor fingers **22**.

Substantially simultaneously with this action the sheet moving element **75** through action of its cam **93** (Fig. 2) moves inwardly toward the side edge of the sheet and yieldably pushes the sheet transversely into contact with the oppositely disposed stop roller **74** to side gauge the sheet. These side gauging rollers **74, 75** contact the leading marginal edge portion of the sheet preferably within a range of from one half to one inch behind the leading edge of the sheet as hereinbefore mentioned.

While the sheet moving element or roller **75** is shifting the sheet transversely to side gauge it against the stop roller **74**, the cam rollers **67, 87** riding on the edge cams **63, 88** rock the gripper shaft **44** to swing the gripper fingers **42** and the anti-buckling fingers **71** downwardly toward the outer face of the impression cylinder **39**. During this movement of the fingers, the projecting noses **72** of the anti-buckling fingers **71** move down close to and overlapping but not touching the leading marginal edge portion of the sheet A being gauged as shown in Figs. 6 and 12 and thus confine this marginal edge portion of the sheet between the noses **71** and the outer surface of the impression cylinder **39** so that the sheet cannot buckle in either direction. This action takes place just before the leading edge of the sheet moves into the bite of the cylinders **38, 39**. With the sheet edge thus confined against buckling and the yieldable sheet moving element **75** continuing to press the sheet against the stop roller **74**, the sheet is very accurately located.

While the sheet A is thus held accurately gauged, the cam rollers **67, 87** ride off the edge cams **63, 88** into the recesses **65** in the cams to permit the compression springs **51** (Fig. 10) under the gripper finger arms **53** to rock the gripper fingers **42** independently of each other into full clamping engagement with the gauged sheet, the projecting noses **59** of the fingers tightly clamping the leading edge of the sheet against the outer surface of the impression cylinder **39** regardless of variations in the thickness of the sheet or other causes as shown in Figs. 6, 10 and 11. The clamped and gauged sheet A then passes into the bite of the cylinders **38, 39** for passage between the cylinders.

As soon as the sheet is in the grip of the cylinders **38, 39**, the sheet moving side gauge element **75** is pulled away from the side edge of the sheet by the barrel cam **93** and the gripper fingers **42** are released by an upward movement of the fingers through engagement of the cam rollers **67, 87** with the cams **63, 88**. The side gauges, i. e. the stop roller **74** and sheet moving element **75** rotating with the impression cylinder **39** move down out of the plane of the sheet and thus are clear of the sheet as it

passes between the cylinders **38, 39** for the lithographing or other operation. As the released leading edge of the sheet passes beyond the cylinders it rides up onto support rails **95** (Figs. 6 and 10) to support the sheets as they pass through the cylinders. This completes the cycle of operation of the machine.

As a modified form of the invention, as shown in Fig. 13, the sheet moving side gauge element **75** is mounted free of the impression cylinder **39** so that it is stationary in relation to the cylinder. The element **75** is located as close to the cylinder **39** as possible and in the horizontal plane of the advancing sheet and adjacent the side edge of the sheet so as to cooperate with the moving stop roller **74** on the cylinder to effect gauging of the sheet in the same manner and at the same time in the cycle of operation as explained in connection with the preferred form of the invention. For this purpose the slide **82** (Fig. 13) which carries the sheet moving element **75** and cam roller **91**, is mounted in a stationary slide block **101** formed on a bracket **102** secured to the adjacent side frame **25**. The slide **82** is reciprocated in the same manner as in the preferred form by the cam **93**. In this modified form the cam **93** withdraws the element **75** from the sheet edge as soon as the gripping fingers **42** clamp the gauged sheet in place. If desired the slide block **101** may be attached to any other suitable stationary part of the machine, such as the machine table and the slide **82** may be reciprocated by a separate cam device actuated by or in time with the rotation of the impression cylinder **39** and feed-in conveyors **21**.

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. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop moving with said cylinder to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, and sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop.

2. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop moving with said cylinder to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, and means moving with said cylinder and disposed adjacent said grippers for confining said sheet against buckling during registry of its side edge with said stop.

3. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop pivotally mounted on said cylinder for rotation therewith to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, and sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop.

4. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylin-

der, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop pivotally mounted on said cylinder for rotation therewith to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, and means carried by said cylinder and disposed adjacent said grippers for confining the leading edge of said sheet against buckling during registry of the side of said sheet with said stop.

5. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop moving with said cylinder to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, and sheet moving means moving with said cylinder and engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop.

6. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop moving with said cylinder to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, sheet moving means pivotally mounted on said cylinder and engageable with an opposite edge of a sheet being fed to said cylinder, and cam means for actuating said pivotally mounted sheet moving means for moving said sheet against said stop.

7. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop moving with said cylinder to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, reciprocable slide means disposed adjacent said cylinder and engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, and cam means for actuating said slide means.

8. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder and operable to grip a sheet fed to said cylinder, a side registering stop moving with said cylinder to register a side edge of a sheet being fed to said cylinder, sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, actuating means for shifting said side registering stop into registering position adjacent a side edge of said sheet, means for actuating said sheet moving means in timed relation with said grippers to register said sheet against said stop and means for effecting gripping engagement of said grippers against said sheet after the sheet has been moved against said stop.

9. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, sheet grippers moving with said cylinder for gripping a sheet fed to said cylinder, a side registering stop to register a side edge of a sheet being fed to said cylinder, means for shifting said side registering stop into registering position adjacent a side edge of said sheet, sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, and means carried by said cylinder and disposed adjacent said grippers for confining said sheet against buckling during registry of its side edge with said stop.

10. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, a rocker shaft carried in said cylinder and extending longitudinally thereof, a plurality of sheet grippers mounted on said shaft for movement with said cylinder and operable to grip a sheet fed to said cylinder, a side registering stop mounted on said shaft for movement with said cylinder to register a side edge of a sheet being fed to said cylinder, sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, means for rocking said rocker shaft to shift said side registering stop into registering position adjacent an edge of said sheet and means for moving said grippers into gripping engagement with the sheet after the sheet has been moved against said stop.

11. In a sheet treating machine, the combination of a rotating cylinder, means for feeding a sheet to said cylinder, a rocker shaft carried in said cylinder and extending longitudinally thereof, a plurality of sheet grippers mounted on said shaft for movement with said cylinder and operable to grip a sheet fed to said cylinder, a side registering stop mounted on said shaft for movement with said cylinder to register a side edge of a sheet being fed to said cylinder, sheet moving means engageable with an opposite edge of a sheet being fed to said cylinder for moving said sheet against said stop, means for rocking said rocker shaft to shift said side registering stop into registering position adjacent an edge of said sheet, means for moving said grippers into gripping engagement with the sheet after the sheet has been moved against said stop, and means disposed between and adjacent said grippers and mounted on said rocker shaft for actuation thereby for confining said sheet against buckling during registry of its side edge with said stop.

12. In a sheet treating machine, the combination of a pair of cooperating rotating cylinders for treating a sheet, means for feeding a sheet along a substantially plane path of travel to said cylinders, a side registering stop mounted on one of said cylinders adjacent one end thereof and rotatable therewith for registering a side edge of a sheet being fed to said cylinders, a sheet moving element mounted adjacent the other end of said cylinder and engageable with an opposite edge of said sheet for moving said sheet laterally against said side registering stop, and anti-buckling means carried by and rotatable with one of said cylinders and extending longitudinally thereof for confining the leading edge of said sheet as said sheet is moved laterally against said stop.

13. In a sheet treating machine, the combination of a pair of cooperating rotating cylinders for treating a sheet, means for feeding a sheet along a substantially plane path of travel to said cylinders, gripper means mounted on one of said cylinders, a side registering stop mounted on one of said cylinders adjacent one end thereof and rotatable therewith for registering a side edge of a sheet being fed to said cylinders, a sheet moving element mounted adjacent the other end of said cylinder and engageable with an opposite edge of said sheet for moving said sheet laterally against said side registering stop, anti-buckling means carried by and rotatable with one of said cylinders and extending longitudinally thereof for confining the leading edge of said sheet as said sheet is moved laterally against said stop, and means for effecting gripping engagement of said gripper means against the leading edge of said sheet after said sheet has been moved against said stop.

14. The apparatus of claim 13, wherein a rocker shaft is carried by one of said cylinders, and said gripper means, said side registering stop, and said anti-buckling means are all mounted on and movable with said rocker shaft.

15. The apparatus of claim 14, wherein said gripper means comprise a plurality of grippers mounted on said rocker shaft, and wherein said anti-buckling means com-

prise at least one elongated finger also mounted on said shaft and disposed adjacent said grippers.

16. The apparatus of claim 15, wherein cam means are provided to rock said rocker shaft and thereby maintain said gripper means, said side registering stop and said anti-buckling device in operative position adjacent the plane of travel of said sheet during the side gauging and front gripping operations.

17. The apparatus of claim 16 wherein said sheet moving element is also mounted on said rocker shaft.

18. The apparatus of claim 17, wherein front gauging

faces are also carried by said rocker shaft to facilitate front gauging of said sheet.

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