Nov. 22, 1949 R. E. J. NORDQUIST ET AL 2,488,551

SHEET FEEDING AND GAUGING MECHANISM

Filed Aug. 19, 1947 6 Sheets-Sheet 1

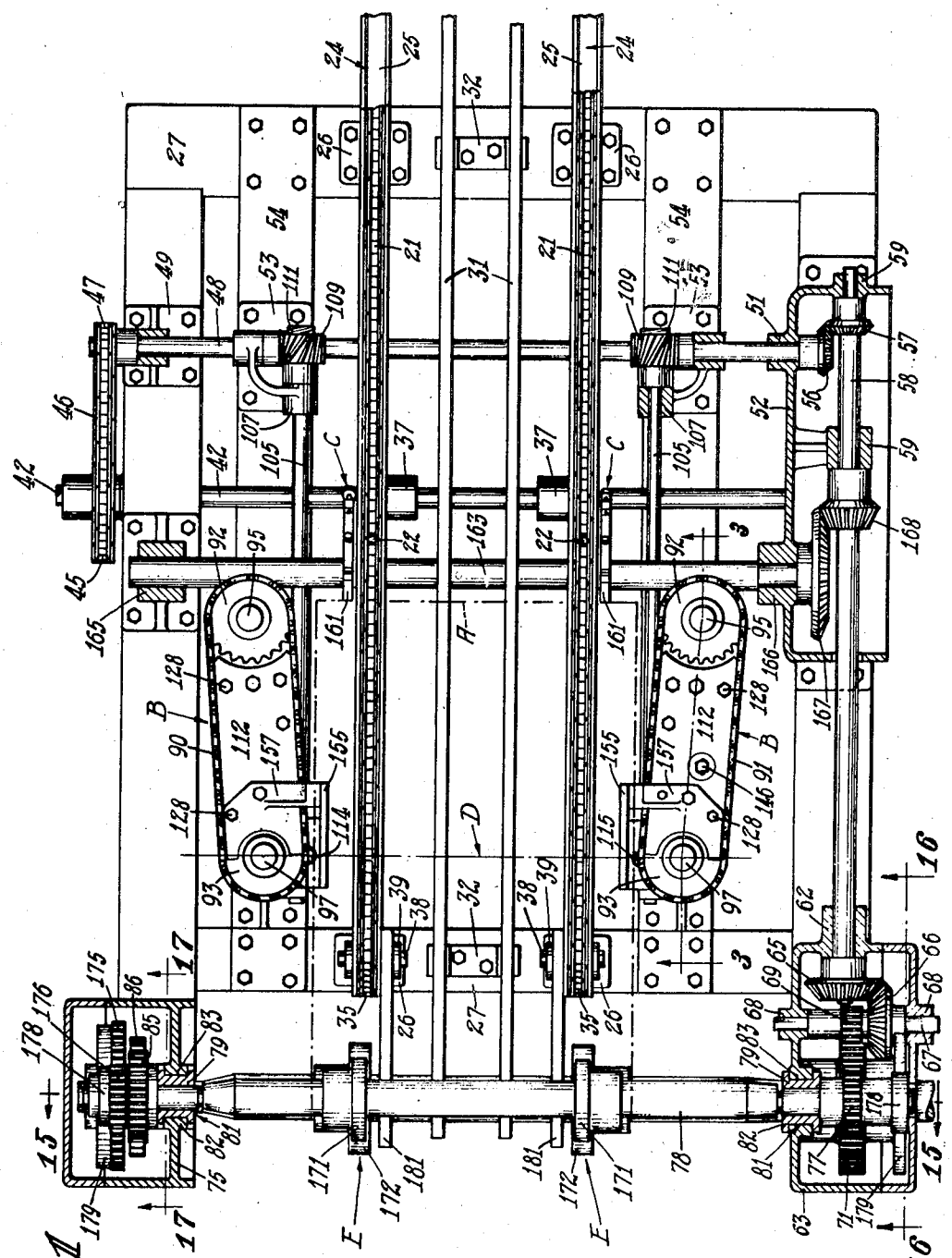


Fig. 1

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SHEET FEEDING AND GAUGING MECHANISM

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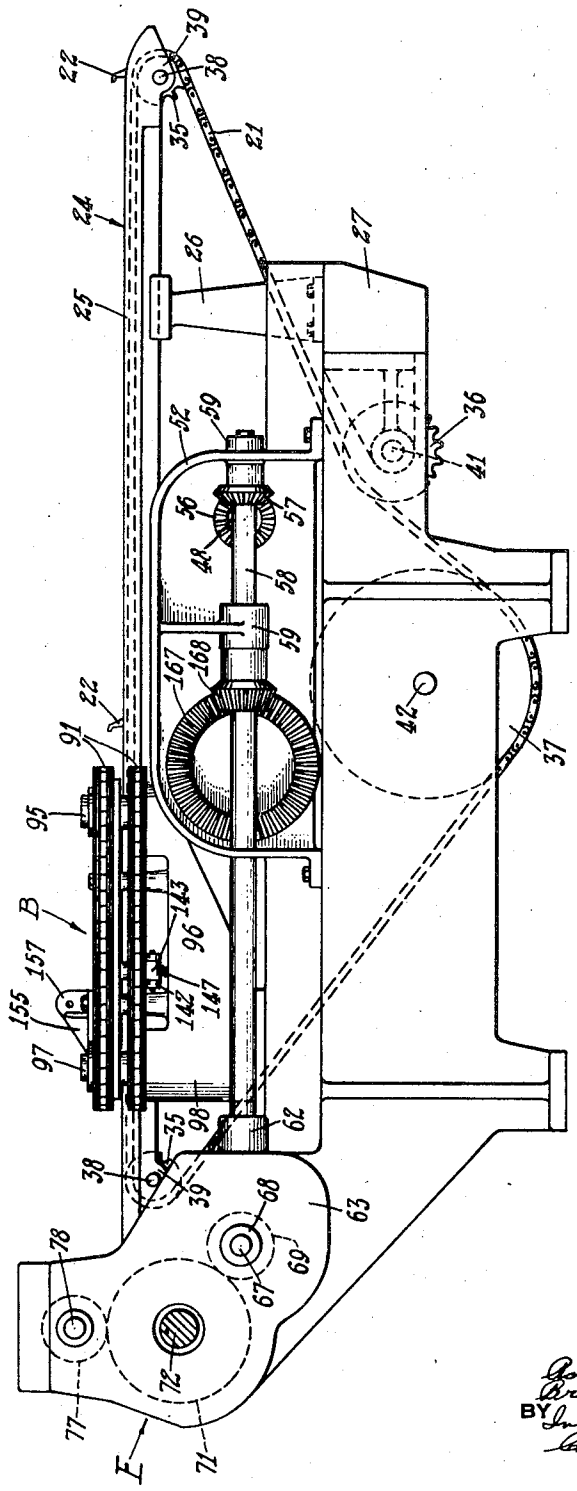


Fig. 2

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SHEET FEEDING AND GAUGING MECHANISM

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Fig. 3

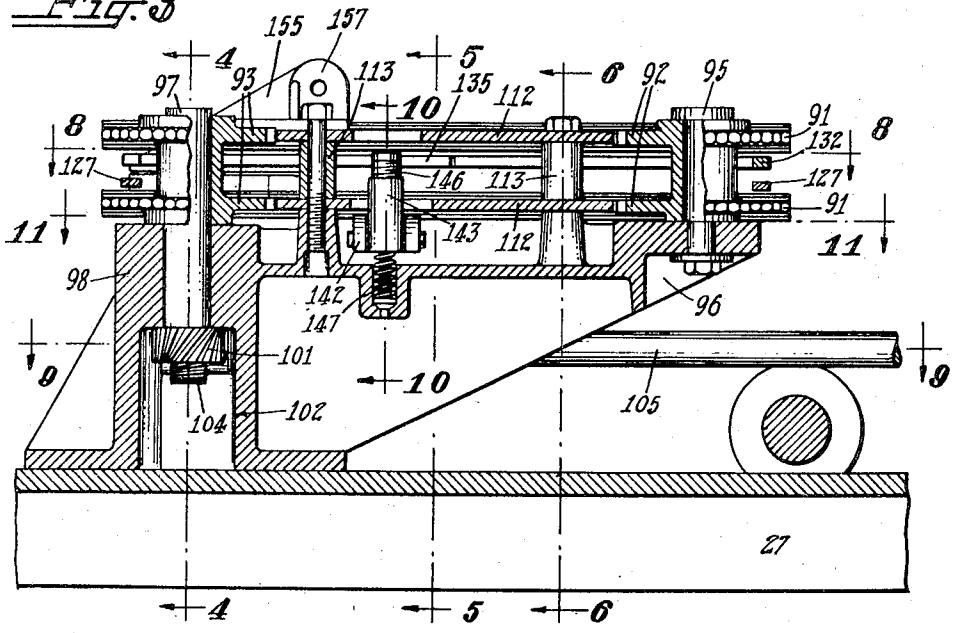


Fig. 4

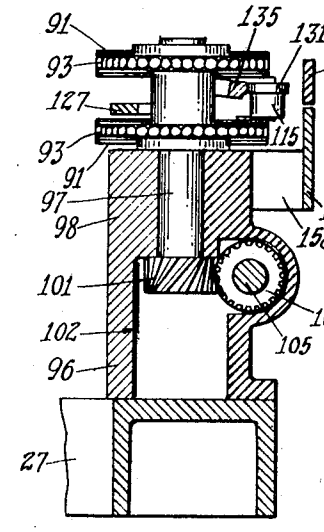


Fig. 5

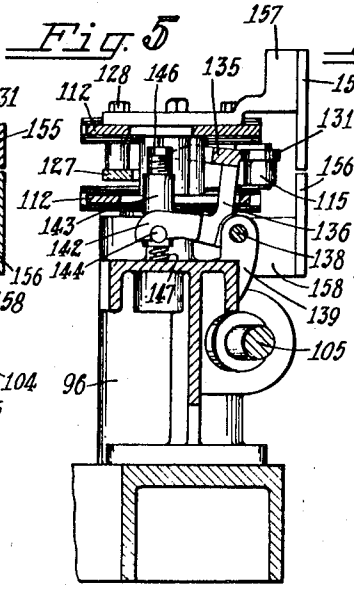
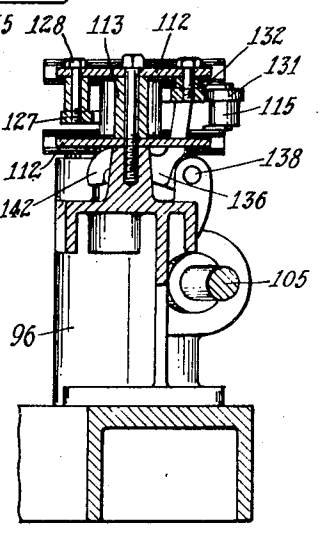


Fig. 6



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SHEET FEEDING AND GAUGING MECHANISM

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Fig. 7

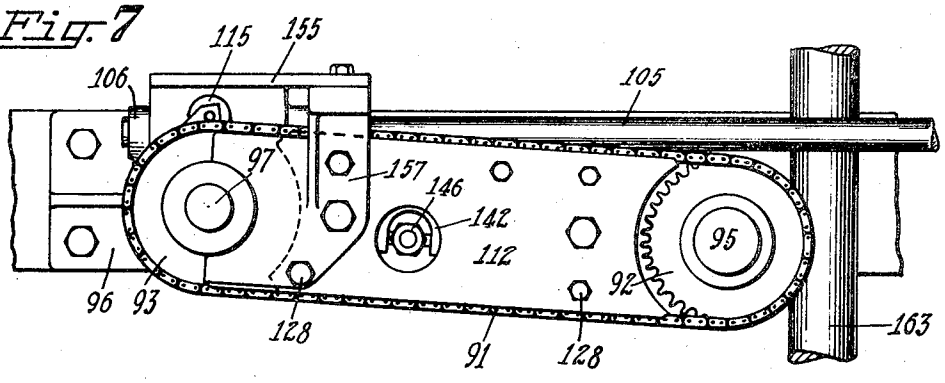


Fig. 8

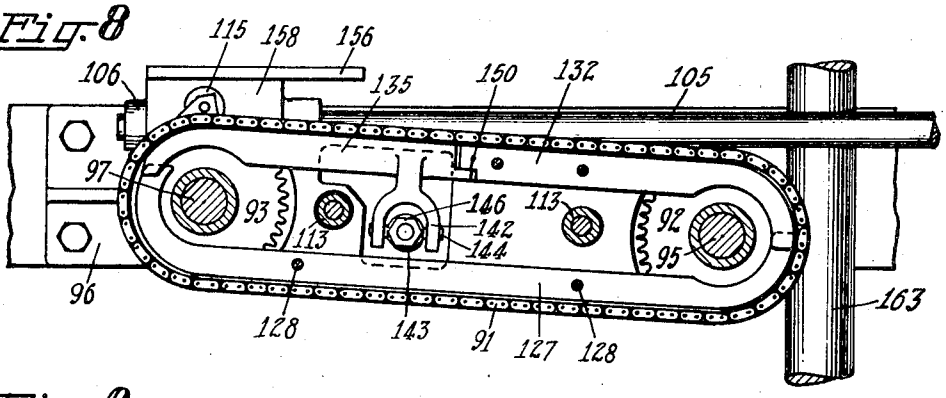


Fig. 9

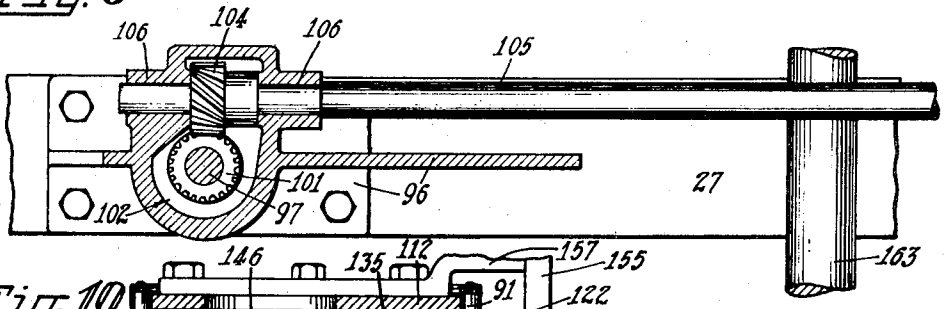
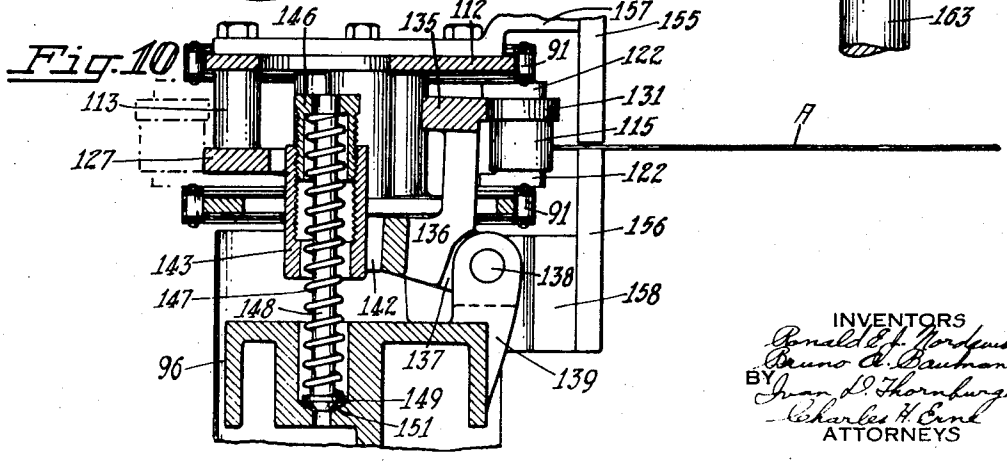


Fig. 10



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SHEET FEEDING AND GAUGING MECHANISM

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Fig. 11

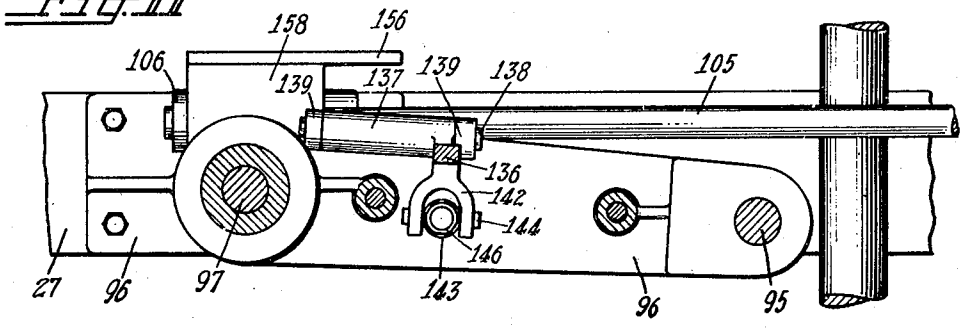


Fig. 12

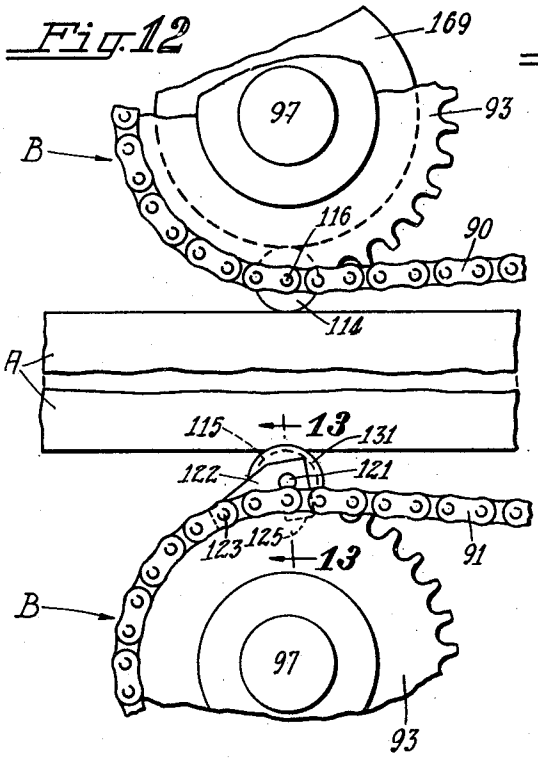


Fig. 13

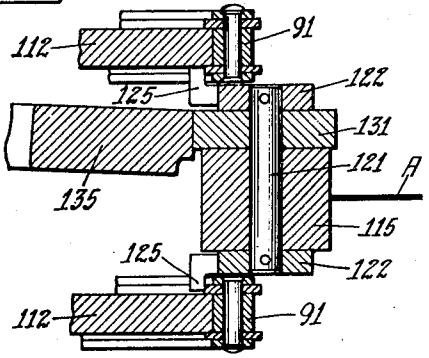
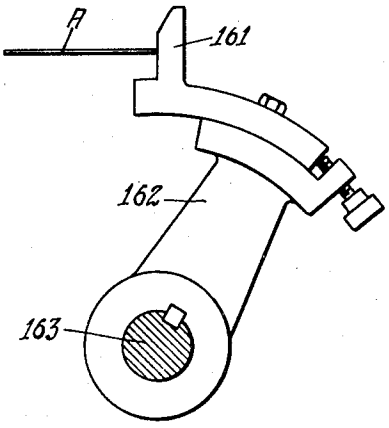


Fig. 14



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SHEET FEEDING AND GAUGING MECHANISM

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Fig. 15

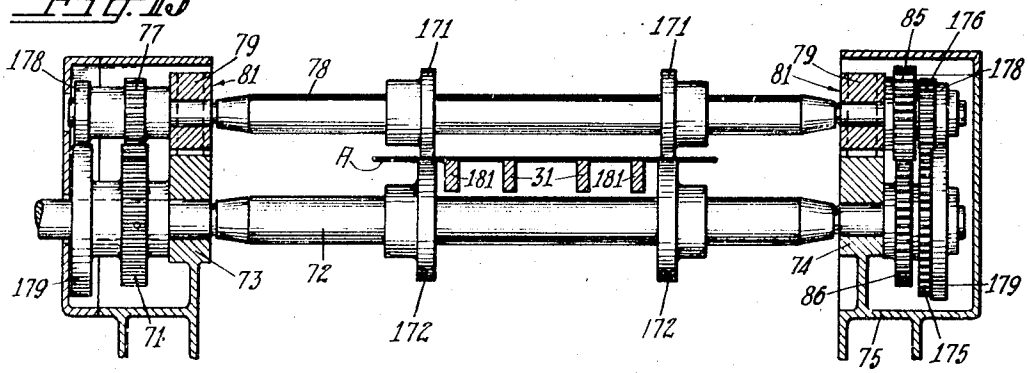


Fig. 16

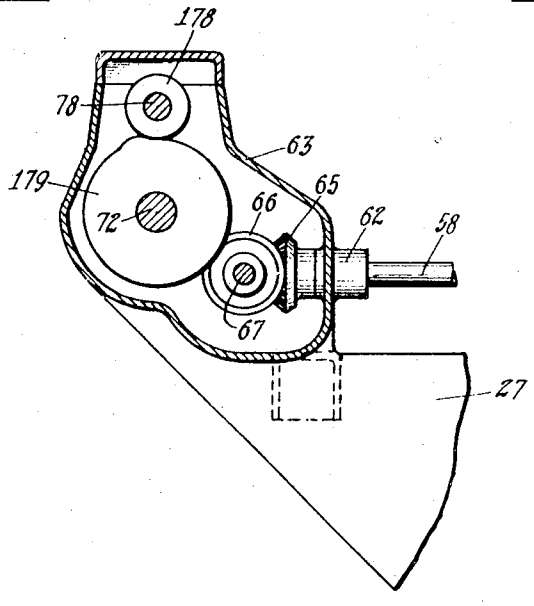
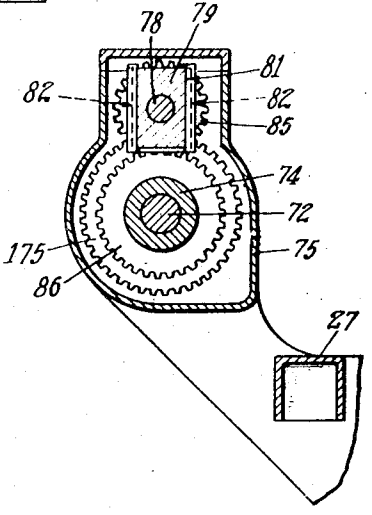


Fig. 17



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2,488,551

UNITED STATES PATENT OFFICE

2,488,551

SHEET FEEDING AND GAUGING MECHANISM

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Application August 19, 1947, Serial No. 769,364

10 Claims. (Cl. 271—59)

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The present invention relates to a sheet feeding and gauging mechanism in which sheet material is required to be located in an accurate predetermined position for further treatment and has particular reference to sheet gauging devices which are movable at an angle to the path of travel of the sheets for locating the sheets in proper position. Reference is here made to our copending United States application Serial Number 769,365, filed August 19, 1947, on Sheet feeding and gauging mechanism.

An object of the invention is the provision in sheet feeding and gauging mechanism of gauging devices which operate to shift a sheet into a predetermined gauged position gently and gradually while the sheet is traveling forward at a high rate of speed so that accurate positioning of the sheet may be obtained without in any way impairing the sheet or interfering with a desired high speed gauging and feeding of the sheet.

Another object is the provision of such gauging devices wherein the devices are timed with the travel of the sheets so that the gauging of a plurality of sheets moving in a procession will be effected at a predetermined point on the edges of all sheets alike.

Another object of the invention is the provision in such gauging devices of a novel pressure device wherein a controlled yielding action may be had in connection with the gauging devices to facilitate proper gauging of a fast moving 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.

Referring to the drawings:

Figure 1 is a top plan view of a mechanism embodying the instant invention, with parts shown in section;

Fig. 2 is a side elevation of the mechanism shown in Fig. 1, with parts broken away;

Fig. 3 is an enlarged longitudinal section taken substantially along the line 3—3 in Fig. 1, with parts broken away;

Figs. 4, 5 and 6 are transverse sectional views taken substantially along the respective lines 4—4, 5—5, 6—6 in Fig. 3, with parts broken away;

Fig. 7 is an enlarged top plan view of one of the gauging devices used in the mechanism, with parts broken away;

Fig. 8 is a sectional view of the gauging device shown in Fig. 7 and taken substantially along the line 8—8 in Fig. 3, with parts broken away;

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Fig. 9 is a sectional view taken substantially along the line 9—9 in Fig. 3, with parts broken away;

Fig. 10 is an enlarged transverse sectional view taken substantially along the line 10—10 in Fig. 3, with parts broken away;

Fig. 11 is a longitudinal section taken substantially along the line 11—11 in Fig. 3, with parts broken away;

Fig. 12 is an enlarged schematic plan view of the gauging devices at the gauging station with a sheet in position between the gauging devices, parts of the devices and the sheet being broken away;

Fig. 13 is a greatly enlarged sectional detail taken substantially along the line 13—13 in Fig. 12, with parts broken away;

Fig. 14 is an enlarged side view of a back gauge used in the mechanism and shown in gauging position against a portion of a sheet being gauged, parts being shown in section;

Fig. 15 is a transverse sectional view taken substantially along the line 15—15 in Fig. 1 and showing a sheet in position, with parts broken away; and

Figs. 16 and 17 are sectional details taken substantially along the respective lines 16—16, 17—17 in Fig. 1, with parts broken away.

As a preferred embodiment of the instant invention the drawings illustrate principal parts of a sheet feeding and gauging mechanism for feeding and gauging sheets A of tin plate or the like sheet material and for advancing them into a sheet treating machine such as a printing machine, scroll shear, slitter or other machine used for preparing or converting the sheets into container or can parts.

In such a feeding and gauging mechanism the sheets A are advanced along a straight line path of travel between a pair of side gauges B (Fig. 1) which are disposed at converging angles and which include side gauging elements moving in time with the sheet. The gauging elements gradually move inwardly toward the moving sheet, engaging gently against the two opposite side edges of the sheet near its middle and thereby shift the sheet into a predetermined side gauged position. This gentle and gradual locating of the sheet is readily effected while the sheet is moving at a high rate of speed and is thus desirable for high speed feeding of sheets.

As the sheets move into a side gauged position a pair of back gauging devices C (Fig. 1) engage the rear edge of the moving sheet and bring this edge into a squared-up or gauged position, thus

gauging the sheet by a three point gauging contact. This gauging of the sheet along its rear edge and along its side edges is effected preferably as the sheet approaches a gauging station D (Fig. 1). When the sheet reaches this station, the gauging is complete, and the sheet is in its predetermined gauged position.

Immediately upon location of the sheet in its gauged position, the forward or leading edge of the sheet is gripped between advancing instrumentalities E which take the sheet away from the gauging elements and advance it rapidly into the subsequent operation machine while retaining the sheet in its gauged position. This completes the cycle of operation of the sheet into and through a gauged position.

The sheets A to be gauged and advanced into the subsequent operation machine for further treatment are fed into the feeding mechanism at the right as viewed in Fig. 1, from any suitable source of supply. The entering sheets travel in a continuous procession one behind the other in spaced relation on a pair of endless feed chains or conveyors 21 (Figs. 1 and 2) having feed dogs 22 secured thereto at spaced intervals along the chains for propelling engagement with the rear transverse edge of the sheets. The upper or feeding runs of these chains operate in longitudinal guide grooves 24 formed in support rails 25 which extend longitudinally of the feeding mechanism. These support rails are mounted on brackets 26 bolted to a frame 27 which may constitute the main frame of the mechanism.

The sheets A during their travel through the mechanism rest in a horizontal flat position on the support rails 25 and intermediate thereof on a pair of spaced and parallel auxiliary support rails 31, which are carried on support brackets 32 disposed adjacent the ends of the rails and mounted on the main frame 27.

The feed chains 21 operate over two pairs of front and rear idler sprockets 35 (Figs. 1 and 2), a pair of auxiliary idler sprockets 36, and a pair of driving sprockets 37. The idler sprockets 35 are mounted on short shafts 38 journaled in bearings 39 formed at the ends of the two support rails 25. The auxiliary idler sprockets 36 are mounted in spaced relation on a transverse shaft 41 journaled in bearings formed in the main frame 27. The driving sprockets 37 are mounted in spaced relation on a transverse driving sprocket shaft 42 which is journaled in suitable bearings formed in the main frame 27 adjacent the transverse shaft 41.

The driving sprocket shaft 42 is continuously rotated by a drive sprocket 45 (Fig. 1) which is mounted on one end of the shaft. The drive sprocket is rotated by an endless drive chain 46 which operates over a sprocket 47 carried on one end of a transverse gear shaft 48. This end of the gear shaft is journaled in a bearing bracket 49 secured to the main frame 27. The opposite end of the shaft is journaled in a bearing 51 formed in a gear casing 52 bolted to the main frame. Intermediate its ends the shaft is journaled in a pair of bearing brackets 53 which are fastened to longitudinal beams 54 of the main frame.

In the gear casing 52, the gear shaft 48 carries a bevel gear 56 which meshes with a bevel gear 57 mounted on an auxiliary drive shaft 58 journaled in a pair of spaced bearings 59 formed in the gear casing. The auxiliary drive shaft 58 extends beyond the gear casing 52 and is journaled in a bearing 62 formed in a drive housing 63 located at the exit end of the feeding mechanism.

The auxiliary drive shaft 58 terminates within the drive housing 63 and carries on this end of the shaft a bevel gear 65. Gear 65 meshes with and is driven by a bevel gear 66 which is mounted on a short cross shaft 67 journaled in bearings 68 formed in the drive housing. The cross shaft carries a pinion 69 which meshes with and is driven by a differential gear 71 (see also Figs. 2, 15 and 17) loosely mounted on but not directly driven by a main driving shaft 72 which extends across the exit end of the feeding mechanism. One end of this driving shaft is journaled in a bearing 73 formed in the drive housing 63. The other end of the driving shaft is journaled in a bearing 74 formed in an auxiliary drive housing 75 located on the opposite side of the feeding mechanism main frame 27.

The differential gear 71 meshes with and is driven by a pinion 77 secured to one end of a roller shaft 78 disposed above and in parallelism with the driving shaft 72. The ends of the roller shaft are journaled in rectangular shaped bearing blocks 79 disposed in slide openings 81 (Fig. 15) in the drive housing 63 and in the auxiliary drive housing 75. These bearing blocks are movable vertically in the housing openings 81 to permit of a slight vertical movement of the roller shaft 78 relative to the driving shaft 72 for a purpose to be hereinafter explained. For this purpose the vertical edges of the bearing blocks 79 are formed with slide grooves 82 (Fig. 1) which partially surround and operate against vertical slides 83 formed in the housings adjacent the slide openings 81.

In the auxiliary drive housing 75 the roller shaft 78 carries a gear 85 (Figs. 1, 15 and 17) which meshes with and which is driven by a main driving gear 86 secured to the main driving shaft 72. The main driving shaft is rotated in any suitable manner.

Hence through this gear train the main driving shaft 72 rotates the roller shaft 78, the short cross shaft 67, the auxiliary drive shaft 58, the transverse gear shaft 48 and the sprocket shaft 42 in proper synchronism and thereby actuates the feed chains 21 in the proper timed relation for advancing the sheets A to be gauged, along a straight line path of travel through the feeding mechanism as hereinbefore mentioned.

Side gauging of the moving sheets A while they are propelled by the conveyors 21 toward the gauging station D is effected by the side gauges B as mentioned above. There are two of these gauges located one on each side of the straight line path of travel of a sheet A through the feeding mechanism and they are of similar construction.

The side gauges B include two sets of endless chain conveyors 90, 91 (Figs. 1, 3, 7 and 8) which are disposed in a horizontal position and at a slight angle to the path of travel of the sheets propelled by the feeding conveyors 21. The gauging conveyors on both sides of the path of travel of the sheets converge toward the exit end of the feeding mechanism. Each of the gauging conveyors 90, 91 comprises a pair of spaced and parallel, upper and lower chains which operate as a unitary double conveyor structure as shown in Fig. 3.

Each set of gauging chains 90, 91 operate over pairs of spaced double sprockets, which constitute idler sprockets 92 and driving sprockets 93 (Fig. 3). The idler sprockets 92 of each set of

chains are mounted on a stationary vertical stud 95 (Figs. 1 and 3) which is secured in a bracket 96 mounted on the main frame 27. There are two of these brackets, located one on each side of the path of travel of the sheets, for the two sets of guaging chains. The driving sprockets 93 of each set of chains are mounted on the upper end of a vertically disposed driven shaft 97 which is journaled in a bearing 98 formed in the brackets 96.

The two sets of angularly disposed gauging chains 90, 91 located on opposite sides of the path of travel of the sheets are actuated continuously, in unison, and in opposite directions so that their inner runs, i. e. the runs adjacent the moving sheet, move in the direction of travel of the sheet and at the same speed as that of the sheet. This continuous and synchronous actuation of the gauging chains is brought about by helical gears 101 (Figs. 3 and 4) which are mounted on the lower ends of the driving sprocket shafts 97 of the gauging devices B. The gears are located within recesses 102 formed in the brackets 96.

The helical gears 101 mesh with and are driven by helical gears 104 mounted on a pair of longitudinal driving shafts 105 (see also Fig. 9) the ends of which are journaled in bearings 106 formed in the brackets 96 and in bearings 107 (see Fig. 1) formed in the brackets 53. There are two of these driving shafts 105 located one on each side of the path of travel of the sheets A. At the brackets 53 the ends of the driving shafts 105 carry helical gears 109 which mesh with and are driven by helical gears 111 mounted on the continuously rotated transverse gear shaft 48. Through this connection with the transverse gear shaft 48 the gauging chains 90, 91 are continuously actuated in the proper timed relation with the travel of a sheet A to be gauged as hereinbefore mentioned.

The two chains of each set of gauging conveyors 90, 91 intermediate their idler sprockets 92 and driving sprockets 93 are maintained in their properly spaced horizontal planes against sagging by a pair of spaced and parallel plates 112 (Figs. 1, 3 and 13) the outer longitudinal edges of which engage against and support the chains. These plates are held in separated relation, by spacer sleeves 113 interposed between them. The plates and the sleeves are held in position by long bolts which extend through these parts and are threadedly secured in the brackets 96.

Gauging of a sheet A is effected while the sheet, propelled by the feeding conveyors 21 passes between the two angularly disposed gauging chains 90, 91 and is brought about by a stop roller or element 114 (Figs. 1 and 12) and a tension or gauging roller or element 115 carried on the gauging conveyors or chains 90, 91 respectively. The stop roller 114 is a fixed gauging element disposed between and traveling with the upper and lower chains of the gauging conveyor 90. The roller is rotatably mounted on a vertical pin 116 the ends of which are secured in the upper and the lower chains of this gauging conveyor 90.

The tension or gauging roller or element 115 is a movable and yieldable gauging element and is disposed between the upper and lower chains of the gauging conveyor 91. This roller is rotatably mounted on a vertical pin 121 (see Figs. 12 and 13) the ends of which are secured in a pair of spaced and parallel swing arms 122 mounted on pivot pins 123 carried in the upper and lower

chains of the gauging conveyor 91. Thus the gauging roller 115 is free to swing outwardly or inwardly relative to its gauging conveyor. Stop lugs 125 formed on the inner edges of the swing arms 122 engage against the inner edges of the chains and thus limit the outward travel of the arms for preventing the roller from swinging too far in this direction.

The two gauging rollers 114, 115 are mounted on their respective gauging conveyors 90, 91 in transverse opposing alignment and travel with their conveyors in unison around the sprockets 92, 93 and along the longitudinal inner and outer runs of the chains in this aligned relation. During this travel, the yieldable gauging roller 115 as it moves along the outer run of the conveyor 91 and passes around the idler sprocket 92 is backed up by a stationary guide rail 127 (Figs. 3, 6 and 8). This guide rail is disposed in spaced relation to and between the chain guide plates 112 and is secured by bolts 128 to the upper plate. The guide rail prevents the roller from swinging inwardly as it travels along with its conveyor.

Both the stop roller 114 and the gauging roller 115, moving with their respective gauging conveyors 90, 91 swing around their idler sprockets 92 at the same time and come into position adjacent but not touching the side edges of the sheet A moving forward on the feed conveyors 21. This action is timed so that the rollers 114, 115 are located intermediate the ends of the sheet in a substantially midway relation. The sheet and the rollers travel forward together at the same speed and with the sheet interposed between the rollers as the latter move along the inner runs of their conveyor chains 90, 91.

As the yieldable roller 115 travels around its idler sprocket 92 it rides off its guide rail 127 but is restrained against uncontrolled movement toward the sheet by an auxiliary roller or gauge element actuating member 131 (Figs. 4 and 13) which is mounted on the roller pin 121 above and adjacent the yieldable roller. This auxiliary roller engages against and rolls along an auxiliary guide rail 132 (Figs. 6 and 8) which extends along the inner run of the gauging conveyor for substantially one half its length and curves around the idler sprocket 92, terminating adjacent and overlapping the terminal end of the guide rail 127. The auxiliary guide rail is disposed between the chain guide plates 112 in spaced relation thereto and is bolted to the upper plate.

As the sheet A continues to advance along its straight line path of travel, the two gauging rollers 114, 115 moving with their angularly disposed gauging conveyors 90, 91 gradually approach the sheet and gently engage against its opposite side edges substantially midway between its ends. If one or the other of the rollers engages a sheet edge before the other, the sheet will be shifted laterally by the engaging roller as the sheet moves forward. The purpose of such lateral shifting of the sheet is to bring it into engagement with the stop roller 114 and to hold it in this position until it reaches the gauging station D.

Holding of the sheet against the stop roller 114 is effected by spring pressure acting against the yieldable roller 115. This spring pressure is exerted against the yieldable roller during its travel along substantially the last half of the inner run of the gauging conveyor 91. For this purpose the auxiliary roller 131 adjacent the yieldable gauging roller 115 in traveling with the conveyor 91 rides off the guide rail 132 and rides onto a yieldable continuing track section 135 (Figs. 8, 10 and

13). This track section extends along the inner run of the gauging conveyor 91 from the terminal end of the auxiliary rail 132 and curves around the driving sprocket 93 where it terminates in overlapping relation with the guide rail 127.

The yieldable track section 135 is formed on a depending hinge arm 136 (Fig. 10) having a long horizontal hub 137 (see Fig. 11) mounted on a pivot shaft 138 the ends of which are carried in a pair of spaced bearing lugs 139 extending up from the adjacent bracket 96. The hinge arm 136 is formed with a laterally extended bifurcated arm 142 which partially surrounds and supports a vertically disposed spring barrel 143. The spring barrel is formed with trunnions 144 which are pivotally mounted in the bifurcated arm.

The spring barrel 143 carries a hollow spring adjusting nut 146 which encloses a compression spring 147 surrounding a vertical support pin 148 having a rounded head 149 on its lower end seated in a recess 151 in the bracket 96. The upper end of the pin projects through an opening in the top of the adjusting nut. The spring is interposed between the adjusting nut and the rounded head of the pin 148 and thus exerts its force through the spring barrel, against the arms 136, 142 and the yieldable track section 135.

This spring pressure normally keeps the outer edge of the yieldable rail in line with the outer edge of the auxiliary guide rail 132 as shown in Fig. 8, a stepped overlapping stop 150 being provided at the adjacent terminal ends of the rails to limit the outward movement of the yieldable track section.

Thus when the yieldable gauging roller 115 engages the adjacent edge of a moving sheet A and pushes the sheet laterally against the stop roller 114 on the opposite side of the mechanism, the sheet is in a gauged position relative to its side edges and the gauging roller cannot move the sheet any further. Hence during the remainder of the travel of the gauging roller along the angularly disposed inner run of its gauging conveyor 91, the roller moves along a straight line path of travel with the sheet and the difference between these two paths of travel is taken up by the compression spring 147, the auxiliary roller 131 pressing the yieldable track section 135 inwardly and thereby compressing the spring.

As the side gauged sheet approaches the gauging station D, the side edge portions of the sheet pass between a pair of upper and lower vertical retaining members 155, 156 (Figs. 7, 8 and 10) having a clearance space between them slightly larger than the thickness of the sheet for retaining the sheet in a flat condition as it passes into the gauging station. There are two sets of these retaining members located one on each side of the mechanism at the gauging station and disposed close to but clear of the path of travel of the stop and gauging rollers 114, 115.

The upper retaining members 155 are secured to overhanging brackets 157 (Figs. 7 and 10) which are bolted to the upper gauging conveyor guide plates 112. The lower retaining members 156 are bolted to bosses 158 (Figs. 8 and 10) formed on the brackets 96.

When the gauging rollers 114, 115 are almost in transverse alignment with the gauging station D, i. e. just before the rollers come into position along a transverse line connecting the centers of the two driving sprockets 93, the side gauged sheet is gauged along its rear edge to bring the sheet into a fully gauged position. Gauging of the sheet along its rear edge is effected at two spaced apart places thus making the full gauging of the sheet under a three point engagement, the two back gauging points being taken with the side gauging point effected by the stop roller 114.

Back gauging of the sheet along its rear edge is effected by a pair of spaced rotary back gauges 161 (Figs. 1 and 14) which are adjustably mounted on arms 162 keyed in spaced relation onto a transverse back gauge shaft 163. One end of this shaft is journaled in a bearing bracket 165 (Fig. 1) bolted to the main frame 27. The other end of the shaft is journaled in a bearing 166 formed in the gear casing 52. Within the gear casing this end of the shaft carries a bevel gear 167 which meshes with and which is driven by a bevel pinion 168 carried on the continuously rotated auxiliary drive shaft 58.

Through the above described connection with the driving means of the mechanism the back gauge shaft 163 is continuously rotated in time with the other moving parts of the mechanism. The rotation of the back gauge shaft rotates the back gauge arms 162 in unison through a circular path of travel below the sheets advanced by the feeding conveyors 21 and brings the back gauges 161 up behind a side gauged sheet at the proper time for engaging against the rear edge of the sheet.

As the back gauges 161 contact the sheet edge, they advance the sheet forward and away from the feed dogs 22 on the feeding conveyors 21 and shift the sheet into a position where both gauges squarely engage the sheet edge. In this position of the sheet, where both back gauges 161 and the stop roller 114 are in contact with the rear and sides respectively, the sheet is in a fully gauged position as shown in Fig. 1. This occurs just as the stop roller 114 and its cooperating yieldable gauging roller 115 come into alignment with the gauging station D. At this station the stop roller 114 engages against and is backed-up by a backing hub 169 (Fig. 12) formed integrally with and between the adjacent driving sprockets 93.

When the sheet A is in this fully gauged position as shown in Fig. 1, its forward edge portion extends beyond the feeding mechanism and is disposed between upper and lower pairs of separated or open advancing rolls 171, 172 (Figs. 1 and 15) mounted on and continuously rotated by the roll shaft 78 and the main drive shaft 72 respectively. As soon as the sheet reaches this fully gauged position as shown in Fig. 1, the upper advancing rolls 171 move down against the sheet, clamping it tightly against the lower advancing rolls 172 and thus together rapidly pull the gauged sheet out of the feeding mechanism and advance it into or toward the subsequent operation machine as hereinbefore mentioned. This clamping of the gauged sheet between the advancing rolls 171, 172 arrests any further action of the gauging devices B on the sheet and thereby prevents the gauging devices from inadvertently shifting the sheet out of its gauged position after it has once been gauged and ready for further advancement.

Movement of the upper advancing rolls 171 into an open position to permit the entrance of the sheet between the rolls and to close them against the sheet and the lower rolls, to advance the sheet, is effected in time with the movement of the sheet and by differential devices located in the drive housings 63, 75. These differential devices include the differential gear 71 and the pinion 77 located in the drive housing 63 and a

similar differential gear 175 (Fig. 15) and pinion 176 located in the drive housing 75. The differential gears 71, 175 are loose on the main drive shaft 72. The pinions 77, 176 are keyed to the upper roll shaft 78. Each of the pinions 77, 176 are formed integrally with cam rollers 178 which rotate on edge cams 179 formed integrally with the gears 71, 175.

Hence as the main shaft 72 rotates the roll shaft 78, through the connecting gears 85, 86, the pinions 77, 176 carried on the roll shaft rotate the differential gears 71, 175 loosely mounted on the drive shaft and thereby rotate the cams 179 at a speed slower than that of either shaft. The speed of rotation of the cams is calculated to provide one rotation of the cams for each sheet A passing through the gauging station D.

Thus once for each sheet, the cams 179 raise the cam rollers 178 and the roll shaft 78 connected therewith to permit the forward edge portion of a gauged sheet to enter between the rolls 171, 172 for clamping and advancing the gauged sheet as hereinbefore mentioned. It is for this reason that the roll shaft is mounted in the slide bearings 79.

The separation of the rolls 171, 172 is just sufficient to permit a sheet to enter between them and is not great enough to effect an unmeshing of the gears carried on the roll shaft 78 and the main drive shaft 72. Support extensions 181 (Fig. 1) of the feeding conveyor support rails 25 project into the spaces adjacent the advancing rolls for supporting the sheets as they enter between the rolls. This advancement of the gauged sheet A into the subsequent operation machine completes the cycle of operations on the sheet.

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.

We claim:

1. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, an endless conveyor located at one side of the path of travel of the sheet and at an angle thereto and operable in time with the travel of the sheet, a stop element mounted in a predetermined position on said conveyor and movable therewith along one side of the path of travel of the sheet, an endless conveyor disposed adjacent the opposite side of the path of travel of the sheet at an angle thereto and operable in time with the travel of the sheet, and a tension gauge element mounted in a yieldable position on said conveyor for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position.

2. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a pair of endless conveyors disposed one on each side of the path of travel of the sheet and at converging angles thereto and operable in time with the travel of the sheet and operable over sprockets disposed at a gauging station, a stop element carried on one of said conveyors, a backing hub for said stop element disposed adjacent said associated gauging station sprocket for holding the stop element in a predetermined position relative to its conveyor, a tension gauge element carried on the other of said conveyors directly opposite said stop element for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, and yieldable means at said gauging station sprocket effective on said tension gauge element for compensating for variation in width of sheet being gauged.

3. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a pair of endless conveyors disposed one at each side of the path of travel of the sheet and at converging angles thereto and operable in time with the travel of the sheet, each of said conveyors comprising a pair of spaced and parallel endless chains operating as a unitary structure, a stop element carried by and mounted between the chains of one of said conveyors and extended beyond the outer surface of the chains, a tension gauge element carried on and pivotally mounted between the chains of the other of said conveyors directly opposite said stop element for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, and spring means connected with said pivotal mounting for yieldably pressing said tension gauge element against the sheet during the gauging operation.

4. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element disposed adjacent one side of the path of travel of the sheet, an endless conveyor disposed adjacent the opposite side of the path of travel of the sheet at an angle thereto and operable in time with the travel of the sheet, a pivotal mounting carried on and movable with said conveyor, a tension gauge element carried on said pivotal mounting for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, and stop means carried on said pivotal mounting and engageable with said conveyor for limiting the outward travel of said tension gauge element when said element is out of engagement with the sheet.

5. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element disposed adjacent one side of the path of travel of the sheet, an endless conveyor disposed adjacent the opposite side of the path of travel of the sheet at an angle thereto and operable in time with the travel of the sheet, a tension gauge element pivotally mounted on said conveyor for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, a track disposed adjacent a portion of the path of travel of said tension gauge element for backing up said gauge element during the sheet gauging operation, and pressure means disposed adjacent said track for yieldably holding the track against said gauge element during the gauging operation.

6. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element disposed adjacent one side of the path of travel of the sheet, an endless conveyor disposed adjacent the opposite side of the

path of travel of the sheet at an angle thereto and operable in time with the travel of the sheet, a tension gauge element pivotally mounted on said conveyor for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, a guide rail disposed adjacent a major portion of the path of travel of said tension gauge element for maintaining said gauge element in a predetermined position relative to said conveyor, and a movable track section forming a continuation of said guide rail and disposed adjacent a gauging station for backing up said gauge element during the sheet gauging operation, and pressure means disposed adjacent said track section for yieldably holding the track against said gauge element during the gauging operation.

7. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element disposed adjacent one side of the path of travel of the sheet, an endless conveyor disposed adjacent the opposite side of the path of travel of the sheet at an angle thereto and operable in time with the travel of the sheet, a tension gauge element pivotally mounted on said conveyor for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, a track section disposed adjacent a portion of the path of travel of said gauge element for backing up said eleemnt during the sheet gauging operation, a pivotal mounting for said track section, and spring means connecting with said pivotal mounting for yieldably pressing the track section against said gauge element during the gauging operation.

8. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element disposed adjacent one side of the path of travel of the sheet and having a combined forward and inward movement, an endless conveyor disposed adjacent the opposite side of the path of travel of the sheet at an angle thereto and operable in time with the travel of the sheet, a tension gauge element pivotally mounted on said conveyor for engaging and gradually shifting the sheet laterally into engagement with said stop element for locating it in a gauged position, a gauge element actuating member also carried on said conveyor, a track disposed adjacent a portion of the path of travel of said conveyor for engaging said gauge element actuating member for backing up said gauge element during the sheet gauging operation, and pressure means disposed adjacent said track for yieldably pressing the track against said gauge element actuating member during the gauging operation.

9. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element movable with and toward the advancing sheet and disposed adjacent one side of the path of travel of the sheet, a tension gauge element disposed adjacent the opposite side of the path of travel of the sheet and movable with and toward the advancing sheet for engaging the sheet at a predetermined point and gradually shifting the sheet laterally into engagement with said moving stop element for locating it in a gauged position, and means disposed in the path of travel of the sheet and engageable therewith for retaining the sheet in its gauged position and for advancing it for further treatment independent of said feeding means.

10. In a sheet feeding and gauging mechanism, the combination of feeding means engageable with a sheet for advancing it along a path of travel, a stop element movable alongside of and toward said advancing sheet on one side of the path of travel of the sheet, a tension gauge element movable alongside of and toward the advancing sheet on the opposite side of the path of travel of the sheet said gauge element being movable in alignment with said stop element and at an angle thereto in time with the travel of the sheet for engaging the sheet at a predetermined point and gradually shifting the sheet laterally into engagement with said aligned stop element for locating it in a gauged position, and a pair of back gauges disposed adjacent said feeding means and engageable with the back edge of the moving sheet during the side gauging operation for squaring-up the back edge of the sheet relative to said stop element and the side edge of the sheet engaging thereagainst.

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