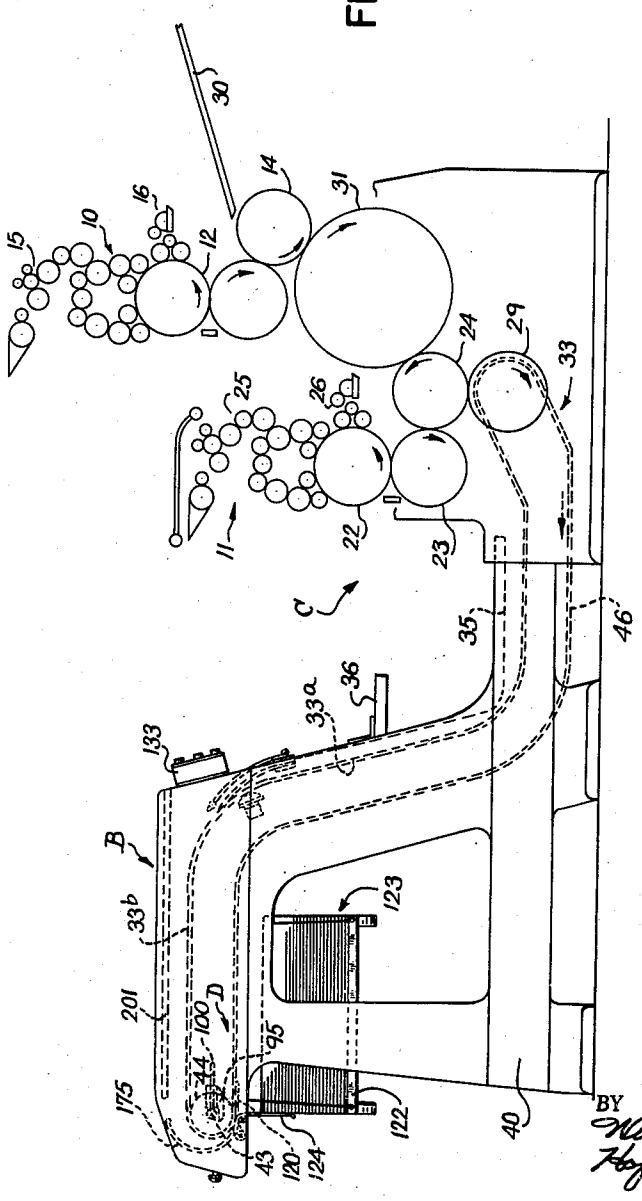
June 29, 1965 R. P. NEIDEN ETAL 3,191,928

PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962

8 Sheets-Sheet 1

FIG. 1



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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962 8 Sheets-Sheet 2

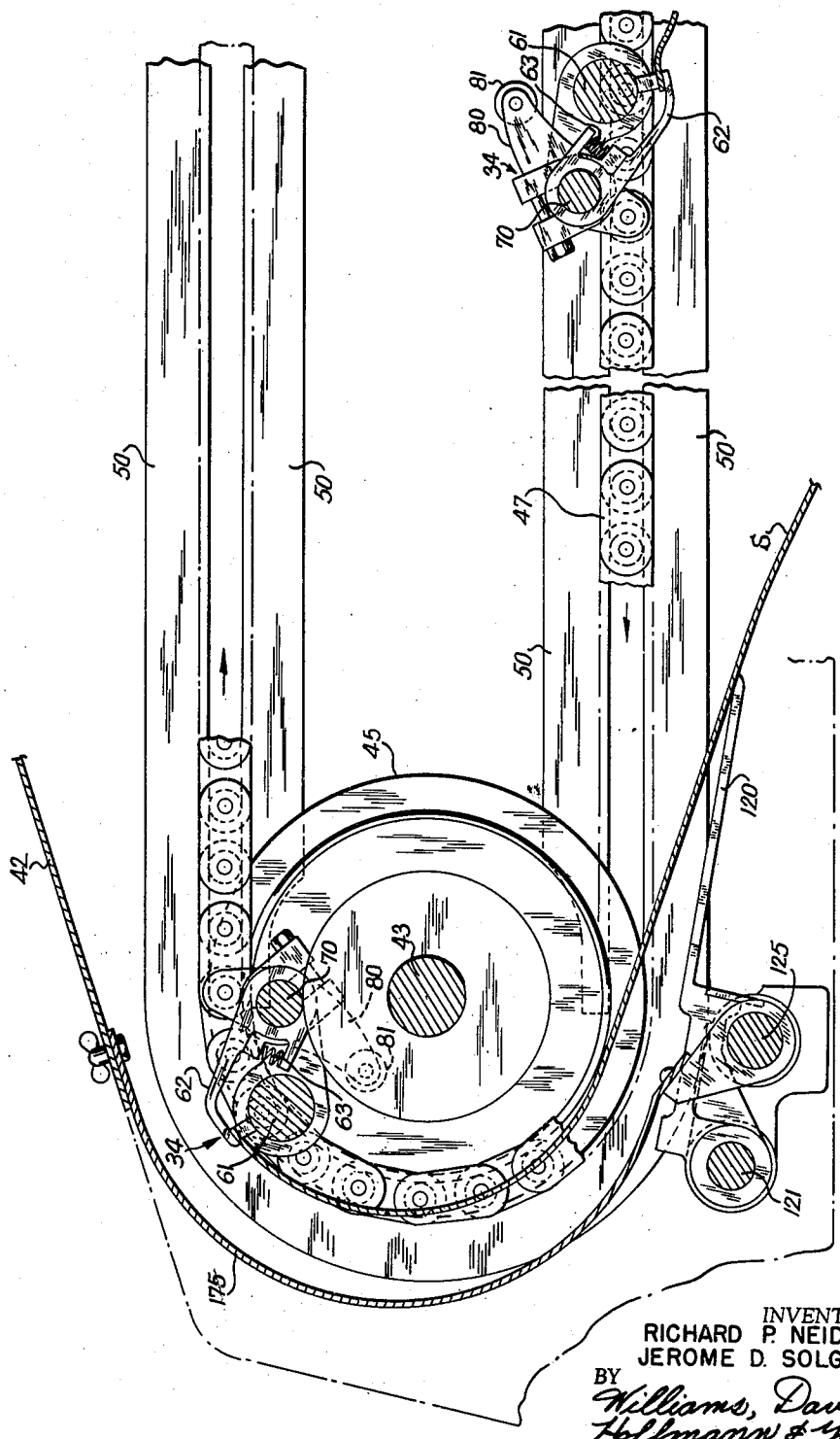


FIG. 2

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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962

8 Sheets-Sheet 3

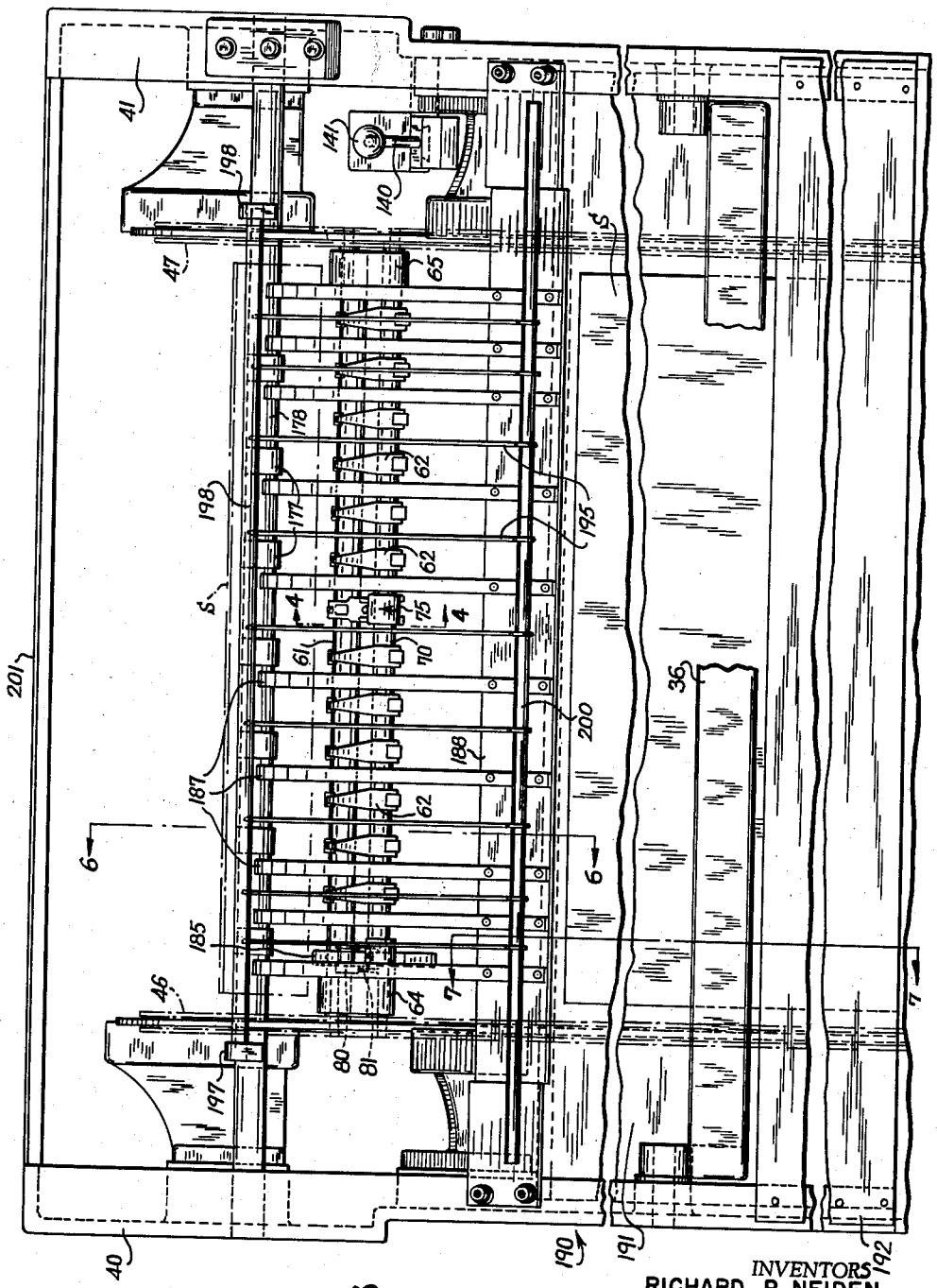


FIG. 3

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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

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8 Sheets-Sheet 4

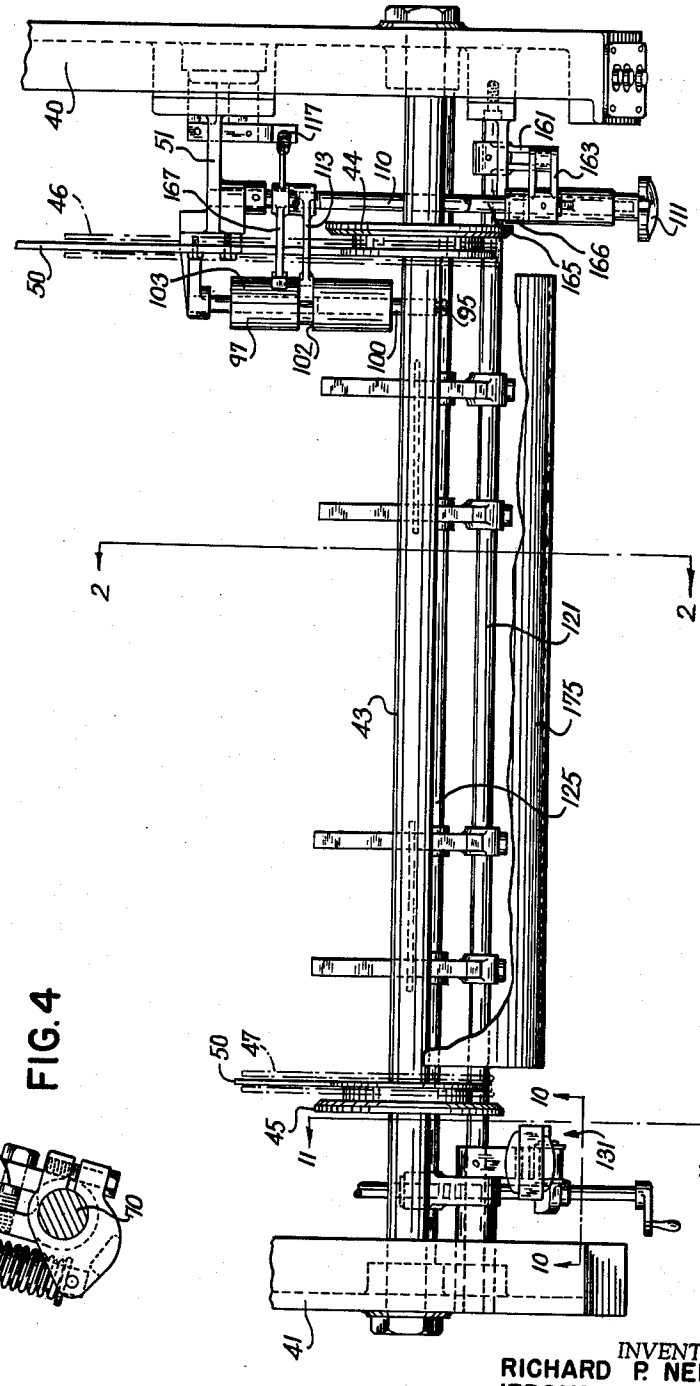


FIG. 5

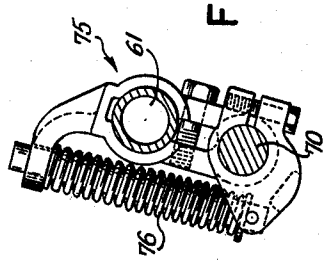


FIG. 4

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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962 8 Sheets-Sheet 5

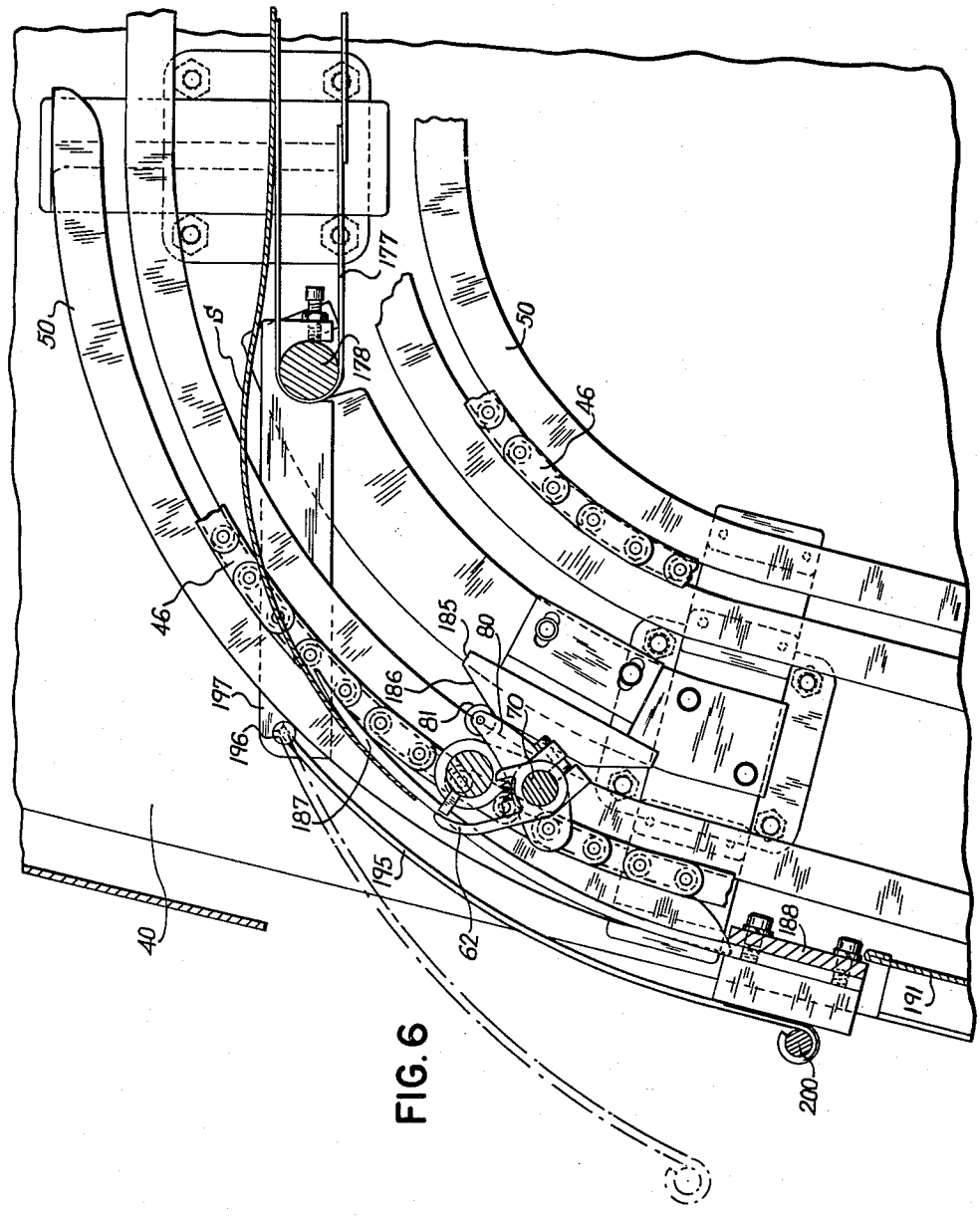


FIG. 6

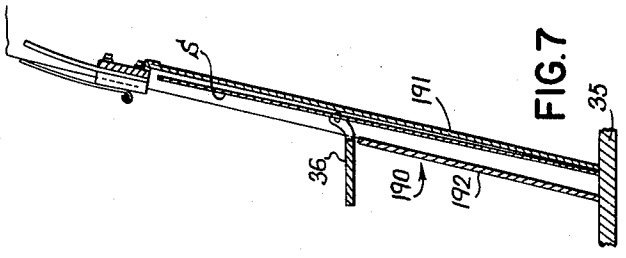


FIG. 7

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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962 8 Sheets-Sheet 6

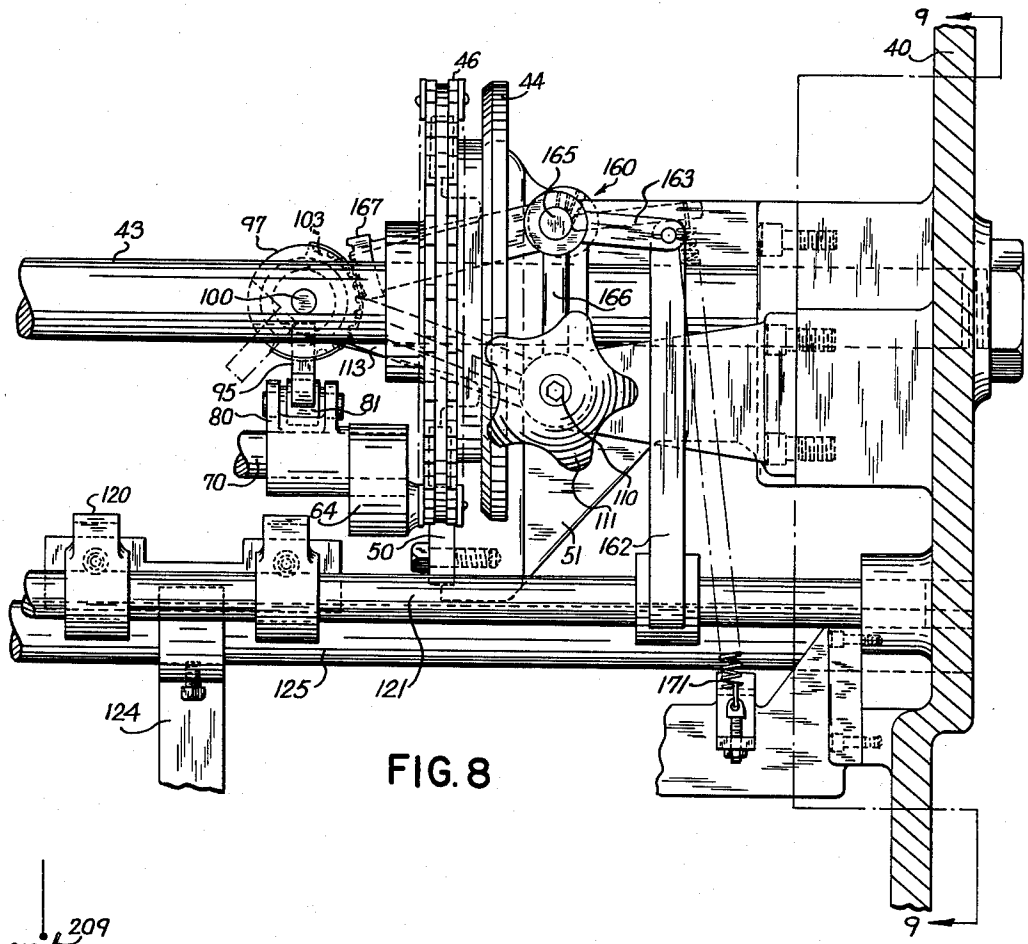


FIG. 8

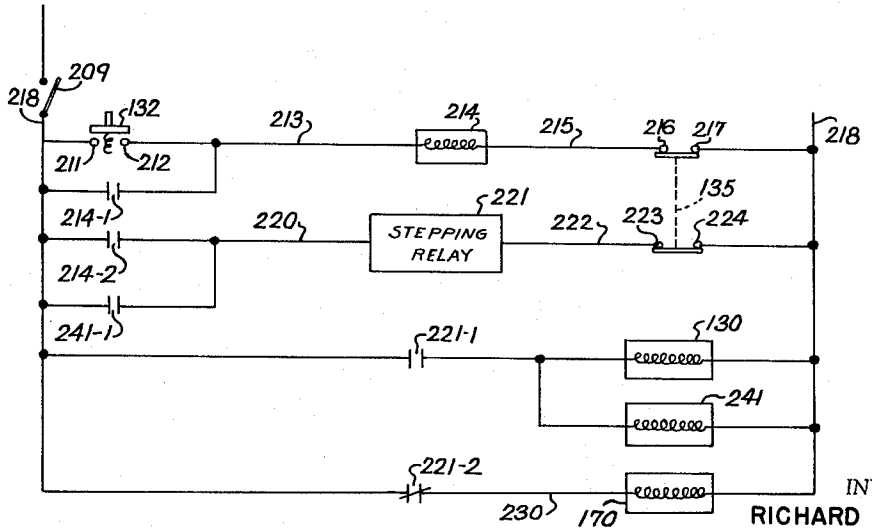


FIG. 13

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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962 8 Sheets-Sheet 7

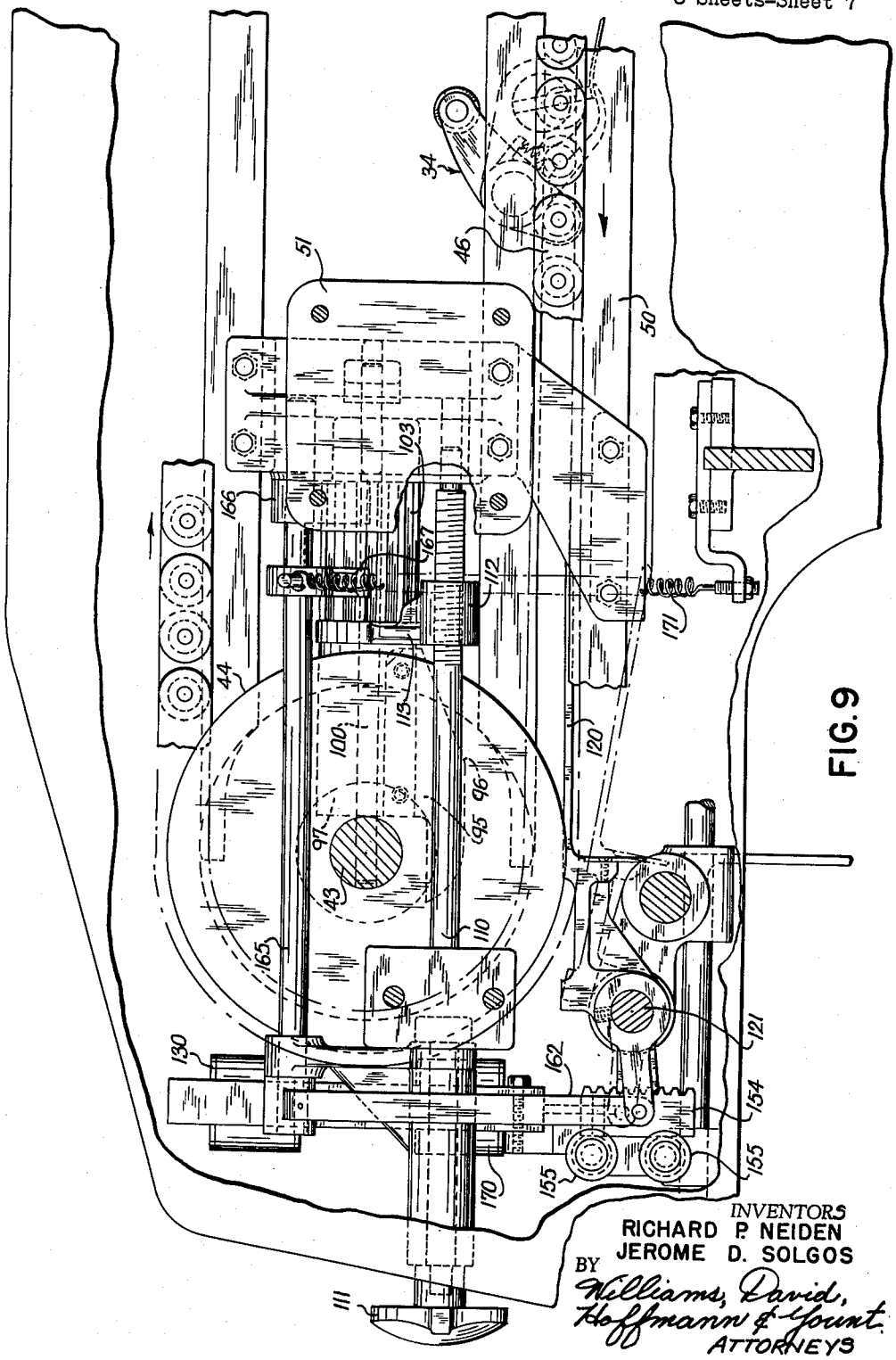


FIG. 9

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PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

Filed Jan. 18, 1962 8 Sheets-Sheet 8

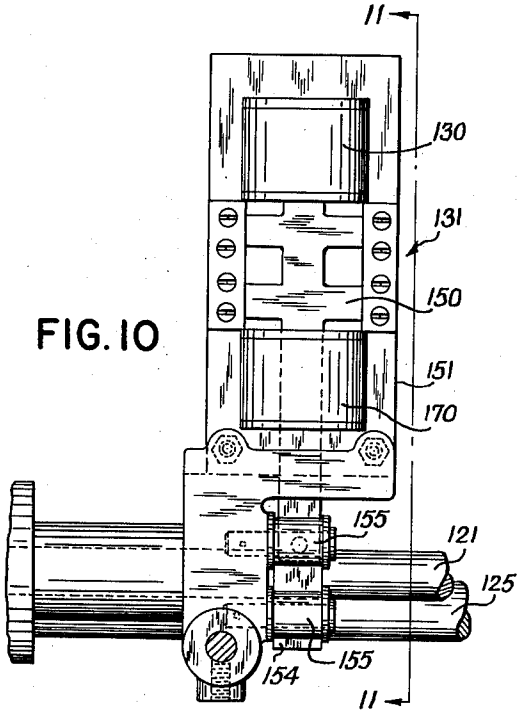


FIG. 10

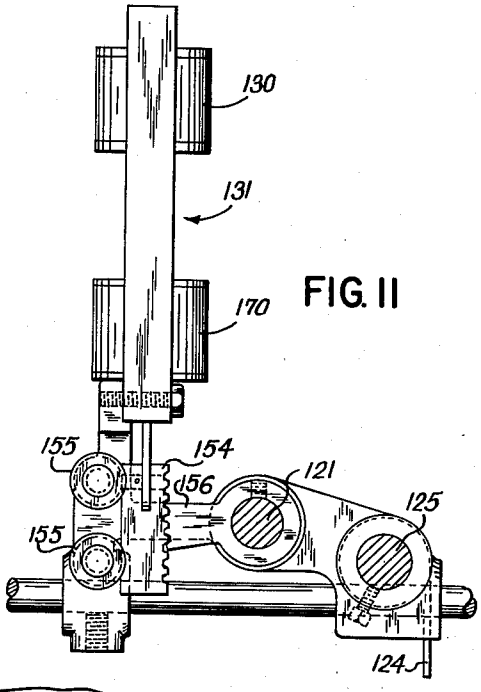


FIG. 11

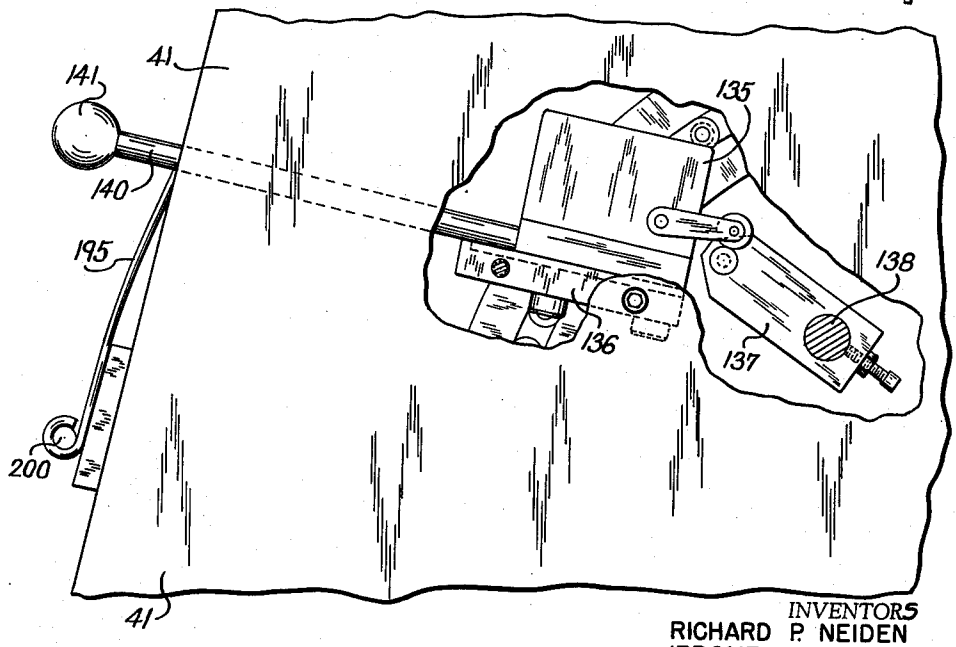


FIG. 12

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United States Patent Office 3,191,928 Patented June 29, 1965

3,191,928

PRINTING PRESS AND DELIVERY WITH SHEET INSPECTION STATION

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Filed Jan. 18, 1962, Ser. No. 166,995
12 Claims. (Cl. 271—64)

The present invention relates to printing presses and deliveries therefor and, more particularly, to such a printing press and delivery having a sheet inspection station at an operator's work station to which a printed sheet may be selectively delivered.

In one type of sheet printing press an operator's work station is located between the last unit of the printing press and the pile elevator of the delivery mechanism. The pressman will make press adjustments, for example, inker adjustments, from this work station while he is setting up the press and during a run. Adjustments, such as inker adjustments, are commonly made by the trial and error method wherein an adjustment is made by guess, sheets printed, and the printed sheet examined to determine the quality of the print and the necessity for further adjustment. Heretofore, in the type of press referred to, it has been necessary for the pressman to leave his operator's station between the last printing unit and the pile elevator to get a printed sheet from the pile or stack on the delivery elevator.

It is an object of the present invention to provide a new and improved printing press having a work station adjacent a printing unit of the press from which the pressman may make adjustments to the printing unit and to which a printed sheet may be selectively delivered.

A further object of the present invention is to provide a new and improved printing press and delivery therefor in which an operator's station for making printing unit adjustments is disposed between the press and the delivery elevator and in which a delivery conveyor having a delivery run and a return run passes under the work station and then runs in a vertical direction to a horizontal run which extends over the delivery elevator, the delivery being so constructed and arranged that the sheet may be dropped at the delivery elevator or caused to reverse its direction with the conveyor and move along the return run to be delivered to the operator's station.

Still another object of the present invention is to provide a new and improved sheet delivery mechanism for a printing unit in which a conveyor has a delivery run which moves in one direction to deliver a sheet to a pile position and a return run which moves in the opposite direction and which passes a work station for making printing unit adjustment, the mechanism being so constructed and arranged that a sheet may be dropped at the pile position or reversed with the conveyor to move in the return direction and dropped at the work station.

Further objects of the present invention will be apparent from the following detailed description of the preferred embodiment thereof made with reference to the accompanying drawings forming a part of this specification, and in which

FIG. 1 is a diagrammatic side elevational view of a printing press and delivery mechanism embodying the present invention,

FIG. 2 is a sectional view taken approximately on section line 2—2 of FIG. 5,

FIG. 3 is a partial end elevational view of the delivery mechanism of FIG. 1 looking at the delivery mechanism from the right,

FIG. 4 is a partial sectional view taken approximately on section line 4—4 of FIG. 3,

FIG. 5 is a partial top view with parts omitted of the delivery mechanism shown in FIG. 1.

FIG. 6 is a sectional view taken approximately on the section line 6—6 of FIG. 3,

FIG. 7 is a sectional view taken approximately on the section line 7—7 of FIG. 3,

FIG. 8 is a partial end view with parts omitted of the delivery mechanism of FIG. 1 looking at the delivery mechanism from the left,

FIG. 9 is a sectional view taken approximately on the section line 9—9 of FIG. 8,

FIG. 10 is a sectional view with parts omitted of the delivery mechanism shown in FIG. 1 taken approximately on section line 10—10 of FIG. 5,

FIG. 11 is a sectional view with parts omitted of the delivery mechanism shown in FIG. 5 taken approximately on section line 11—11 of FIGS. 5 and 10,

FIG. 12 is a partial side view of the delivery mechanism shown in FIG. 3 looking at the delivery mechanism of FIG. 3 from the right and having the side frame member broken away; and

FIG. 13 is a schematic view of a portion of the electrical circuitry used in the apparatus of FIG. 1.

The present invention is embodied in a press and delivery mechanism shown in FIG. 1. The press is a multicolor printing press having first and second printing units 10 and 11, respectively, and a delivery mechanism B which receives the printed sheets from the press, the sheets being designated S in the drawings, and stacks the sheets onto a delivery elevator 123.

The printing units are preferably conventional, rotary, offset, lithographic sheet printing units. The printing unit 10 is shown as comprising a plate cylinder 12, a blanket cylinder 13, and an impression cylinder 14. An inker 15 is located above the plate cylinder 12 and a dampener 16 is located to the right of the plate cylinder 12, as viewed in FIG. 1, to act on the plate cylinder 12 in advance of the inker. Printing unit 11 is shown as comprising a plate cylinder 22, a blanket cylinder 23, and an impression cylinder 24. An inker 25 is located above the plate cylinder 22 and a dampener 26 is located to the right, as viewed in FIG. 1, of the inker 25 to act on the plate cylinder in advance of the inker.

The sheets to be printed by the printing units are fed down a feedboard 30 to the impression cylinder 14 of the printing unit 10. The impression cylinder carries the sheets through the first printing station at the print line between the blanket and impression cylinders 13, 14. A double-size transfer cylinder 31 receives the sheets from the impression cylinder 14 after they pass through the first printing station and transfers them to the impression cylinder 24 of the printing unit 11. A double-size transfer cylinder is one having twice the diameter of the impression cylinders of the press. The impression cylinder 24 carries the sheets through a second printing station at the print line of the blanket cylinder 23 and the printed sheets are then taken by a delivery conveyor 33 which passes around a sheet delivery drum 29 disposed adjacent the impression cylinder 24.

The conveyor 33 comprises a plurality of spaced gripper assemblies 34 supported between endless chains 46, 47 having upper and lower runs defining the delivery and return runs of the conveyor. The conveyor 33 passes around the sheet delivery drum 29 and extends from the sheet delivery drum 29 under a work platform 35 defining an operator's station C, rises vertically after passing under the platform 35 to provide a generally vertical portion 33*a* and then extends horizontally through a horizontal portion 33*b* over the pile elevator 123. The lower runs of the endless chains 46, 47 define the delivery run of the conveyor and the sheets taken from the impression cylinder 24 are moved along the lower runs of the chains

46, 47 to a position over the pile elevator 123 where they are released and allowed to drop onto the pile elevator. The upper runs of the chains 46, 47 provide the return run of the conveyor for returning the gripper assemblies. The gripper assemblies 34 are spaced from each other along the chains 46, 47 a distance which is equal to the circumference of cylinder 24 so that the gripper assemblies will be successively moved into position to take successive sheets from the impression cylinder 24.

The platform 35 is at about approximately the same level as the sheet delivery drum 29 and is disposed below the level of the cylinders of the printing unit 11. The platform 35 forms a work station for the pressman and the pressman may, from the work station, make press adjustments, such as adjustments of the inkers 11 and 15. In the press illustrated, the printing unit 10 is at a higher vertical elevation than the printing unit 11 so that the plate cylinder and the inker of the printing unit 10 are above the level of the inker of the printing unit 11. The printing units are disposed close together and, in the illustrated press, it is possible for a pressman at the operator's station C to make adjustments to both the printing unit 10 and the printing unit 11 from the station C. A hinged step 36 extending across the press may be provided above the platform 35, as is shown in FIG. 1. As is shown therein, the hinged step 36 is supported by the frame structure of the delivery mechanism and may be swung vertically upwardly to an inactive, out-of-the-way position.

The delivery mechanism B has a frame including two vertically extending side frame members 40 and 41 which support an upper frame member 42 extending therebetween. The chains 46, 47 are adjacent the side members 40, 41, respectively, and pass around pulley members 44, 45, respectively, fixedly secured on a rod 43 in spaced relation, the member 44 being located adjacent side frame member 40 and member 45 being located adjacent side frame member 41. The chain 46 is trained around pulley member 44 and around other sprockets, not shown, for guiding the chain through its endless path. The chain 47 is trained around pulley member 45 and also around other sprockets, not shown, for guiding the chain 47 through its path. The portions of chains passing around the pulley are reversing sections which join the delivery and return runs of the endless chains.

The chains 46, 47 are driven through their endless path by a drive mechanism, not shown, to the sheet delivery drum 29. Suitable tracks or guides comprising bar members 50 are provided, where necessary, for guiding the movement of chains 46 and 47. The bar members 50 are positioned to engage top and bottom surfaces of the chains and are supported by suitable supporting structures 51 which are suitably secured to the side frames 40, 41. Referring to FIG. 8 by way of example, the lower bar member 50 for chain 46 is there shown bolted to the supporting structure 51.

The gripper assemblies 34 are supported by chains 46, 47 and are spaced apart along the chains a distance approximately equal to the circumference of the impression cylinder 24. Each sheet gripper assembly 34 is adapted to receive the leading edge of a sheet on the impression cylinder of printing unit 11 in a conventional manner and to grip the sheet to cause it to move with the assembly. The construction and operation of all of the sheet gripper assemblies 34 is identical and only one of the gripper assemblies 34 will be described, but on the drawings the same reference numerals are used to designate corresponding parts of all of the sheet gripper assemblies.

Each sheet gripper assembly 34 includes a gripper bar 61 which extends between the chains 46, 47 and a plurality of gripper fingers 62 spaced along the bar and supported by a rod 70. The fingers 62 are biased by springs 63 toward the gripper bar 61. The left end of the gripper bar 61 as viewed in FIG. 3 is fixedly supported in a yoke member 64 secured to chain 46, and the right end of the gripper bar is fixedly supported in a yoke member 65 secured to chain 47. The gripper fingers 62 are rotatably mounted on the rod 70 and the left end of the rod is rotatably mounted in the yoke member 64 and the right end of which is rotatably mounted in the yoke member 65, as viewed in FIG. 3.

The rod 70 is biased in a counterclockwise direction, as viewed in FIG. 2, by a conventional tension spring mechanism 75 which holds the gripper fingers 62 in gripping engagement with a sheet. The tension spring mechanism 75 includes a coil spring 76 supported at one end by gripper bar 61 and at the other end by rod 70 to bias the gripper fingers 62 into gripping position in a conventional manner. Upon rotation of rod 70 in a clockwise direction as viewed in FIG. 2, the gripper fingers 62 will be rocked about the axis of rod 70 against the bias of spring 76 to release the sheet held thereby. A bifurcated arm 80 is fixedly secured to shaft 70 on the end thereof adjacent side frame 40 and supports a roller 81 which is adapted to be moved downwardly by a trip cam 95 which rotates shaft 70 in a clockwise direction and causes the gripper fingers 62 to rock and release the sheet held thereby.

The trip cam 95 has a cam surface 96 which moves roller 81 downwardly to release the gripper assemblies and is located between the delivery and return runs of chains 46, 47 adjacent the left end thereof as viewed in FIG. 1 at a release point D. The trip cam 95 depends from a generally cylindrical member 97. The support member 97 is rotatably and slidably mounted on a rod 100, one end of which is fixedly supported in the support member 51 and the other end is supported by the rod 43 which has a passageway in which the rod 100 is inserted. The member 97 is provided with a peripheral groove 102 intermediate its ends and gear teeth 103 located on the cylindrical surface thereof on one side of the groove 102. Specifically, the gear teeth 103 are located on the portion of member 97 which lies above groove 102 as viewed in FIG. 5. The trip cam 95 is normally held, as will be described hereinbelow, in a position wherein it is located in the path of movement of the rollers 81 of the gripper assemblies to cause cam surface 96 to move the rollers 81 downwardly as the rollers pass the trip cam 95 to release the sheets held by the gripper assemblies. The cam surface 96 will normally engage the roller 81 of each gripper assembly as the gripper assembly passes thereby to release the sheet held thereby.

The member 97 is slidable along the rod 100, on which the member 97 is mounted, so that the location of the cam surface 96 can be varied to cause the sheets to be released by the gripper assemblies 34 at different points along the path of movement of the chains 46 and 47. The member 97 is slid along the rod 100 in response to rotation of shaft 110 which extends parallel to side frame member 40 and is rotatably supported by suitable support members secured to the side frame 40. The right end of shaft 110, as viewed in FIG. 9, is threaded while the left end projects slightly beyond the end frame member 40 and carries a knob 111 which serves as a means for rotating the shaft 110. The threaded end of the rod has a sleeve 112 threaded thereon and one end of a suitable yoke member 113 is welded to the sleeve 112 and projects therefrom in a direction perpendicular to shaft 110. The other end of member 113 is positioned in groove 102, formed in the member 97. Rotation of the knob 111 causes the shaft 110 to rotate and the sleeve 112 is moved along the shaft, thus causing the yoke member 113 to slide the support member 97 along shaft 100, thereby adjusting the position of the trip cam 95 relative to the chains 46 and 47.

A plurality of stripper fingers 120 are positioned at release point D slightly below the level of the lower run of chains 46, 47 and are spaced transverse to the direction of movement of the chains adjacent the trip member 95. The stripper fingers are fixedly mounted on shaft 121

which is rotatably supported at its opposite ends by the side frame members **40**, **41** for a purpose to be described hereinbelow. The stripper fingers **120** normally are positioned as shown in full lines in FIG. 9, and when in this position engage a portion of the upper surface of a sheet being advanced to strip the sheet from the gripper assembly **34** upon release thereof to cause the sheet to drop onto a pile support **122** of the delivery elevator **123** and the pile support is lowered as the sheets are dropped thereon in a conventional manner to maintain the top of the pile at approximately the same height.

As a sheet drops onto the pile support **122** the leading edge thereof engages end gate fingers **124** which normally extend vertically downwardly from shaft **125** on which they are mounted. The end gate fingers function to guide the sheet into position on the pile support **122**, thereby forming a pile of aligned sheets. The opposite ends of shaft **125** are rotatably mounted in the side frame housings **40**, **41** and may be rotated by a conventional crank mechanism, not shown, to rotate the end gate fingers clockwise, as viewed in FIG. 1, into substantially a horizontal position to facilitate, as is known to those skilled in the art, removal of one or more of the sheets which has been placed on the pile support **122**.

When the operator of the press desires to inspect a printed sheet to determine the quality of the printing and whether or not adjustment of the printing units **10** and **11** is necessary, the delivery mechanism B may be operated to deliver a sheet to the operator at the operator's station C so that the operator need not leave the operator's station and takes a sheet from the pile on the pile support **122** for inspection thereof.

In order for the delivery unit B to deliver a printed sheet to the operator's station C the trip cam **95** is moved out of the path of movement of roller **81** on the gripper assembly approaching release point D and the stripper fingers **120** are lowered out of the path of movement of the sheet carried thereby, thus permitting the chains **46**, **47** to carry the sheet beyond release point D along the aforementioned reversing run at the left end of the delivery mechanism as viewed in FIGURE 1, and along the return run of the chains **46**, **47**. The operator can cause the trip cam **95** to be moved out of the path of movement of the roller **81** by energizing a solenoid coil **130** of a double acting solenoid **131** supported in any suitable manner adjacent the side frame member **41** near the left end thereof as viewed in FIG. 5. The solenoid coil **130** can be energized by the operator from the operator's station C by depressing a switch **132** on a control panel **133** located at the operator's station.

Actuation of the switch **132** on the control panel **133** causes energization of the solenoid coil **130** when a switch **135** is actuated. The circuit involved will be described in detail hereinbelow. The switch **135** is actuated at a predetermined point in the cycle of operation of the apparatus by an actuating member **137** (see FIG. 12) fixedly secured to a shaft **138** which is oscillated in timed relation to the drive to the chains **46**, **47** and thus the coil **130** is energized when the chains **46**, **47** are at a predetermined point in their path of movement, namely, when a gripper assembly **34** supported by the chains **46**, **47** is approaching trip cam **95**. As shown in FIG. 12, the switch **135** is fixed to a slide member **136** and has a rod **140** secured thereto. The rod **140** has a knob **141** which the operator may grip to pull rod **140** to the left, as viewed in FIG. 12, to slide the switch **135** out of the path of movement of actuating member **137**. Of course, if the switch is moved the coil **130** of the solenoid **131** cannot be energized, as will be apparent from the detailed description of the electrical circuit hereinbelow.

Energization of coil **130** of solenoid **131** causes the armature **150** of the solenoid to move vertically upward relative to the frame **151** of the solenoid. A rack **154** is connected to the portion of the armature **150** which extends below the frame **151**. When the armature **150** moves upwardly the rack **154** moves upwardly as well. The upward movement of the rack **154** is guided by a pair of rollers **155** suitably mounted adjacent the rack to engage one side thereof. The rack **154** meshes with a sector gear **156** which is fixedly secured to the shaft **121** on which the stripper fingers **120** are fixedly supported. The upward movement of the rack **154** and the sector gear **156** will cause the shaft **121** to rotate in a clockwise direction as viewed in FIG. 11 and cause the stripper fingers **120** to pivot downwardly to the dotted position shown in FIG. 9. In this position the stripper fingers are below the path of movement of the sheet, and thus the sheet can move past the stripper fingers.

Rotation of the shaft **121** also actuates a mechanism, generally designated **160**, for swinging trip cam **95** out of the path of movement of the roller **81** of the oncoming gripper assembly **34**. The mechanism **160** includes a link **161** fixedly secured to the shaft **121** adjacent the end of the shaft **121** which is supported by the side frame member **40** and extending in a direction parallel to side frame member **40**. The lower end of a vertically extending link **162** is secured to the link **161** at a point remote from where link **161** is secured to shaft **121**. One end of a horizontally extending bifurcated link member **163** which extends in a direction parallel to the extension of shaft **121** is pivotally connected to the upper end of link **162**. The other end of link member **163** is fixedly secured to a horizontally extending shaft **165**, which shaft extends parallel to the side frame member **40**, and is rotatably supported at its opposite ends by support members **166** which are suitably secured to the side frame **40**. A sector gear **167** is fixedly secured to shaft **165** and meshes with the gear teeth **103** formed on member **97**.

The trip cam **95** is biased to move toward its normal position in the path of movement of the rollers **81** of the gripper assemblies by a counterbalancing spring **171**. The spring **171** biases sector gear **167** in a clockwise direction about the axis of shaft **165** and trip cam **95** toward a position in which it will engage the rollers **81** of the gripper assemblies when the press is at rest. When the solenoid coil **130** actuates the trip cam to its inactive position the spring **171** will act in a direction to aid the return of the trip cam to its normal tripping position. A solenoid coil **170** acts on armature **150** to move the latter downwardly when the coil **170** is energized to move the cam to its normal position. The downward limit for the armature **150** may function as the stop for limiting the movement of the trip cam by the spring **171**.

From the foregoing it is apparent that the solenoid **130** is energized to move the trip cam **95** to its inactive position and that upon the energization of the solenoid the shaft **121** will rotate in a clockwise direction, as viewed in FIG. 9, the sector gear **167** will rotate in a counterclockwise direction, as viewed in FIG. 8, and the member **95** will rotate in a clockwise direction about rod **100** to the dot-dash position shown in FIG. 8. When the member **95** is located in the dot-dash position shown in FIG. 8, it will not engage the roller **81** which releases the gripper assembly **34** from engagement with the sheet being fed. Thus the sheet rather than being dropped onto the pile support **122** will be conveyed around the aforementioned reversing section and along the return run of the conveyor. As a sheet is conveyed around the reversing section, as shown in FIG. 2, the trailing end of the sheet tends to whip away from the left end of the delivery mechanism B and this whipping action of the sheet is limited by a guard **175**.

As the sheet is conveyed along the return run of the chains **46** and **47** and starts down the vertical portion **33***a* of the conveyor the trailing end of a sheet tends to drape downwardly, as shown in FIG. 6. A plurality of cloth tapes **177** are suitably supported between the delivery run and return run of the chains **46** and **47** and spaced transverse to the direction of movement of the chains **46** and **47** to support the draped sheet and prevent

the sheet from interfering with the delivery run of the chains 46 and 47. The tapes 177 are in the form of a loop and are trained around a bar 178 located, as shown in FIG. 6, at the top of the aforementioned vertical portion 33a of the chains 46, 47 and supported at its opposite ends by side frame members 40, 41. The other end of the tapes 177 are trained around a pipe, not shown, suitably supported at its opposite ends by the side frames 40 and 41.

As the gripper bar assemblies 34 carry sheets along the return run of the chains 46 and 47 and as the gripper bar assemblies 34 begin to move downwardly on the aforementioned vertical section of the return run of the conveyor chains the rollers 81 of the gripper assemblies 34 engage a trip cam 185 suitably supported by side frame member 40. The trip cam 185 has a cam surface 186 which when the rollers are engaged thereby causes the rollers to pivot in a direction towards the gripper bars 61, namely in a counterclockwise direction, as viewed in FIG. 6. This causes the gripper assemblies to release the sheet which is being conveyed.

The sheets released by the gripper assemblies 34 are stripped therefrom by a plurality of stripper fingers 187. The stripper fingers 187 extend vertically and are spaced transverse to the direction of movement of the chains 46, 47. The lower end of each stripper finger 187 is suitably secured to a plate 188 located below trip 185, and which extends between and is supported by the side frames 40, 41. The upper end of each stripper finger 187 is located above the trip 185 and in position to engage the under side of the sheet being conveyed to guide the sheet outwardly from the gripper assemblies 34 when the latter are released.

The lower ends of the stripper fingers 187 are located above a receptacle-like structure 190 which receives a sheet released by trip cam 185. The structure 190 is formed by two plates 191, 192 extending along the side of the operator's station adjacent the delivery mechanism. The plate 191 extends between the side frame members 40, 41 and the opposite ends thereof are secured to the underside of the side frame members. The plate 192 extends parallel to plate 191 and is secured at its opposite ends to the upper side of the side frame members 40, 41. The plate 192, as shown in FIG. 7, does not extend vertically as far as does plate 191, for a purpose to be described hereinbelow. The bottom of the receptacle-like structure 190 is formed by platforms 35 which extends under the structure 190.

As a sheet moves toward the receptacle-like structure 190 after its release, it is also guided by means of a cage comprising a plurality of guide fingers 195 which extend vertically and are spaced outwardly from the stripper fingers 187, as viewed in FIG. 6. The fingers 195 and fingers 187 actually form a guide channel through which the sheet moves. The topmost ends of the guide fingers 195 are secured to a rod 196 which is rotatably supported at its opposite ends in bar members 197 and 198, which in turn are fixedly secured to bar 178. The opposite sides of rod 196 rest on the bar members 50 of the guides or tracks for chains 46, 47. The lower ends of the guide fingers 195 are secured to a bar 200 which extends transversely of the direction of movement of the chains 46 and 47 and which may be gripped by the operator and raised to pivot the guide fingers 195 about the axis of the rod 196 to provide access and facilitate removal of a long sheet from the receptacle 190. Since the plate 191 does not extend vertically as far as plate 192 the sheet in the receptacle 190 is easily available to the operator.

When a sheet is removed from the receptacle 190 by the operator it is placed on a suitable inspection table 201, which is provided by the top frame member 42 of the delivery mechanism B. When the sheet is positioned on the inspection table 201 the operator standing at the operator's station can inspect the sheet carefully to determine what adjustments should be made in the printing units. The operator may then make these adjustments while standing at the operator's station.

As hereinbefore mentioned, the operator may without leaving the operator's station C, inspect a printed sheet at the operator's station by depressing switch 132 to actuate solenoid coil 130. Referring to FIG. 13, when start switch 209 is closed, depressing switch 132 completes a circuit from power line 210 through contacts 211, 212 of switch 132, conductor 213, relay 214, conductor 215 and normally closed contacts 216, 217 of switch 135 to conductor 218.

While the contacts 216, 217 of switch 135 are normally closed these contacts are opened when switch 135 is actuated by actuating member 137. If the operator depresses switch 132 when the member 137 is holding the switch open no circuit will be completed and the sheet will be released onto the pile support 122. Normally this would not create any problems, because the switch 135 is open only during a small part of the rotation of shaft 136. In the event this does occur the operator may depress switch 132 twice in succession to actuate relay 214.

Energization of relay 214 causes the normally open contacts 214–1 and 214–2 thereof to close. Closing of contacts 214–1 establishes a holding circuit for relay 214 so that the operator may release switch 132 without de-energizing relay 214.

A stepping relay 221 is in circuit with contacts 214–2 of relay 214. The stepping relay 221 is of a conventional construction wherein the flow of current through the relay "cocks" the relay and a break in the flow of current steps the relay. The relay has normally open contacts 221–1 and normally closed contacts 221–2. When the relay is stepped the contacts 221–1 close and contacts 221–2 open until the relay 221 is stepped again, which causes contacts 221–2 to close and contacts 221–1 to open. Thus, these contacts alternate opening and closing.

Normally, contacts 221–2 of relay 221 are closed and this maintains a circuit from power line 210 through closed contacts 221–2 of relay 221, conductor 230 and solenoid coil 170 to power line 218. Energization of coil 170 causes the armature 150 of solenoid 131 to be held in its down position and thereby holds trip member 95 in the path of rollers 81 and the stripper fingers 90 are held in their up positions.

The closing of contacts 214–2 of relay 214 completes a circuit from power line 210 through now closed contacts 214–2 of relay 214, conductor 220, stepping relay 221, conductor 222, contacts 223, 224 of switch 135 to power line 218. The contacts 223, 224 of switch 135 are opened at the same time contacts 216, 217 are opened and they are also closed at the same time. Thus, since contacts 216, 217 had to be closed to energize relay 214, contacts 223, 224 are closed, thereby causing a flow of current through stepping relay 221. As aforementioned, this flow of current merely "cocks" the relay.

When the switch 135 is opened by trip 136 the contacts 216, 217 and 223, 224 open. Opening of contacts 216, 217 breaks the circuit through relay 214, de-energizing relay 214 and opening contacts 214–1 and 214–2 thereof. Opening of contacts 214–1 performs no function since these contacts are in the circuit to relay 214 which was broken by opening contacts 216, 217 of switch 135. The opening of contacts 214–2 also performs no function since these contacts are in the circuit containing contacts 223, 224 of switch 135.

When the contacts 223, 224 open, breaking the circuit through stepping relay 221, the stepping relay is actuated to step to a position in which contacts 221–1 are closed and contacts 221–2 are open. Opening of contacts 221–2 breaks the circuit to coil 170 of solenoid 131 and closing of contacts 221–1 completes a circuit from power line 210 through now closed contacts 221–1 of relay 221, conductor 240 and coil 130 of solenoid 131 as well as

through relay 241 to the power line 218. Energization of coil 130 causes the stripper fingers 120 to lower and the trip cam 95 to swing out of the path of movement of rollers 81 on the gripper assemblies, as described above.

Energization of relay 241 causes normally open relay contact 241–1 to close. Closing of these contacts completes a circuit from power line 210 through contacts 241–1 of relay 241, conductor 220, stepping relay 221, conductor 222, and contacts 223, 224 of switch 135 to power line 218. Energization of the stepping relay again "cocks" the relay 221.

As the next sheet approaches trip cam 95 the switch 135 will be again opened, breaking the circuit to relay 221 and causing the relay 221 to step to a position in which contacts 221–1 thereof open and contacts 221–2 thereof close. Opening of contacts 221–1 of the relay 221 breaks the circuit to the solenoid coil 130 and to relay 241, causing relay contacts 241–1 to open. Closing of contacts 221–2 cimpletes a circuit through the coil 170 of solenoid 131 thereby swinging the trip member 95 back into the path of movement of roller 81 and raising stripper fingers 120. This returns the circuit to its normal condition and it may be again actuated to cause a sheet to be delivered to the operator's station.

It should be apparent that the first sheet which approaches release point D after the operator depresses switch 132 will be conveyed to the operator's station. The second sheet which approaches release point D after the operator depresses switch 132 will be released at release point D and drop onto the pile support 122. Any one of the subsequent sheets will be conveyed to the operator's station upon depressing of switch 132, but in the described circuit only every other sheet, at the most, may be conveyed to the operator's station.

Although the preferred embodiment of the present invention has been described in considerable detail, it is to be understood that the present invention is not to be limited correspondingly in scope but rather covers all modifications, adaptations, and constructions which fall within the scope of the appended claims.

Having described our invention, we claim:

1. A printing press and delivery mechanism therefor comprising a printing unit, delivery means for receiving a sheet from said unit and delivering it over a pile position, and an operator's station between said position and said unit and from which an operator can make adjustments to said unit, said delivery means including a delivery conveyor having sheet-gripping mechanism for taking printed sheets from said unit and a delivery run through which said sheet-gripping mechanism moves to deliver a sheet from said printing unit to said position and a return run moving in a direction opposite to said delivery run for returning said gripper mechanism to said unit, said return run passing adjacent said operator's station, first sheet-release means for effecting a release of a sheet from said conveyor at said pile position, means for selectively rendering said first sheet-release means ineffective, a second delivery station adjacent the return run of said conveyor at said operator's station and accessible to an operator at said operator's station, and second sheet-release means for effecting operation of said gripping mechanism independent of said first sheet release means to release a sheet gripped thereby at said second delivery station as said gripping mechanism moves thereby.

2. A printing press and delivery mechanism therefor comprising a printing unit, delivery means for receiving a sheet from said unit and delivery it over a pile position, and an operator's station between said position and said unit and from which an operator can make adjustments to said unit, said delivery means including a delivery conveyor having sheet-gripping mechanism for taking printed sheets from said unit and a delivery run through which said sheet-gripping mechanism moves to deliver a sheet from said unit to said position and a return run moving in a direction opposite to said delivery run for returning said gripper mechanism to said unit, one of said runs passing adjacent said operator's station, first sheet-release means for effecting a release of a sheet from said conveyor at said pile position, a delivery station remote from said pile position and adjacent the said one of said runs of said conveyor at said operator's station and accessible to an operator at said operator's station, and second sheet-release means for effecting operation of said gripping mechanism independent of said first sheet-release means to release a sheet gripped thereby at said second delivery station as said gripping mechanism moves thereby.

3. A printing press and delivery mechanism therefor comprising a printing unit, delivery means for receiving a sheet from said unit and delivering it over a pile position and an operator's station between said position and said unit and from which an operator can make adjustments to said unit, said delivery means including a delivery conveyor having sheet-gripping mechanism for taking printed sheets from said unit and a delivery run through which said sheet-gripping mechanism moves to deliver a sheet from said unit to said position and a return run moving in a direction opposite to said delivery run for returning said gripper mechanism to said unit, said return run passing adjacent said operator's station, first sheet-release means for effecting a release of a sheet from said conveyor at said pile position, means for selectively rendering said first sheet-release means ineffective, a second delivery station adjacent the return run of said conveyor at said operator's station and accessible to an operator at said operator's station, second sheet-release means independent of said first sheet-release means for effecting operation of said gripping mechanism to release a sheet gripped thereby at said second delivery station as said gripping mechanism moves thereby and a delivery drum cooperating with said conveyor and disposed on the same side of the operator's station as said unit and said conveyor passes under said operator's station and then rises vertically between said position and said station to a horizontal portion which extends over said pile position.

4. A printing press as defined in claim 3 wherein said return run moves downwardly in a generally vertical direction adjacent the side of said operator's station remote from said printing unit and sheet stripper fingers and said second gripper-release means are supported adjacent said return run at said station, said second gripper release means operating said gripper mechanism to release a sheet as the gripper mechanism moves downwardly adjacent said operator's station and said stripper fingers guiding the released sheet outwardly of the conveyor path.

5. A printing press and delivery mechanism as defined in claim 3 wherein said delivery means includes a frame structure comprising means providing a table top adjacent said operator's station on the side thereof remote from said printing unit.

6. An apparatus of the class described comprising a printing unit, delivery means for receiving a sheet from said printing unit and delivering it over a pile position, an operator's station between said pile position and said printing unit from which an operator may make adjustments to said printing unit, said delivery means including a delivery conveyor having a sheet gripping mechanism thereon for taking a printed sheet from said printing unit and a delivery run remote from said operator's station through which said sheet gripping mechanism moves to deliver a sheet from said printing unit to said pile position and a return run passing adjacent said operator's station and moving in a direction opposite to said delivery run, first gripper release means for effecting a release of a sheet from said conveyor at said pile position, a delivery station at said operator's station adjacent the return run of said conveyor and accessible to an operator at said operator's station, means providing for de-

livery of a sheet by said sheet gripping mechanism to said delivery station at said operator's station so that an operator can inspect a sheet delivered thereto without leaving the operator's station including control means at said operator's station for selectively rendering said first sheet release means ineffective to release a sheet at said pile position, and second gripper release means independent of said first gripper release means for effecting operation of said gripping mechanism to release a sheet gripped thereby at said delivery station when said gripping mechanism is moving along said return run to deliver a sheet from said gripping mechanism to said operator's station for inspection by an operator at said operator's station.

7. An apparatus as defined in claim 6 wherein said return run of said delivery conveyor moves downwardly in a generally vertical direction adjacent the side of said operator's station remote from said printing unit, and sheet stripper fingers and said second gripper release means are supported adjacent said return run at said operator's station, said second gripper release means operating said gripping mechanism to release a sheet as the gripping mechanism moves downwardly adjacent the side of said operator's station and said stripping fingers guiding the released freely falling sheet outwardly of the conveyor path, and wherein a receptacle means is located at said delivery station to receive a sheet delivered to said operator's station for inspection and accessible to an operator at said operator's station.

8. An apparatus as defined in claim 6 wherein said first sheet release means includes a movable cam member having a first position for cooperating with said sheet gripping mechanism to effect release of a sheet at said pile position and a second position wherein it is ineffective to cooperate with said sheet gripping mechanism and wherein said control means includes actuatable means for effecting movement of said cam to its said second position.

9. An apparatus as defined in claim 8 wherein said control means comprises means operable upon actuation of said actuatable means for effecting movement of said cam to its said second position for automatically returning said cam to its said first position from its said second position after a gripping means has moved thereby.

10. An apparatus of the class described comprising a printing unit, delivery means for receiving a sheet from the printing unit and delivering it over a pile position, an operator's station adjacent said printing unit between said unit and said pile position, an operator's platform at said operator's station on which an operator may stand and from which the operator may make adjustments to said printing unit, a delivery conveyor for receiving a sheet from said printing unit and having sheet gripping means for taking a printed sheet from said printing unit and a delivery run through which said sheet gripping means moves to deliver a sheet from said unit to said pile position and a return run for returning the gripping means toward said unit, said return run passing adjacent said operator's platform, first sheet release means effecting the release of a sheet from said gripping means at said pile delivery position, means providing for removal of sheets from said delivery pile position at a position remote from said operator's station, a sheet delivery station at said operator's station and accessible to an operator on said platform at said station to enable the operator to inspect a sheet delivered thereto while at said operator's position, and a second sheet release means independent of said first sheet release means and effecting the release of a sheet at said sheet delivery station to deliver a sheet to said delivery station and to an operator at said operator's station for inspection by the operator so that an operator at said operator's station may inspect the sheet without leaving the operator's platform.

11. An apparatus of the class described comprising a delivery conveyor having sheet gripping mechanism for gripping a sheet, a delivery run through which said sheet gripping mechanism moves to deliver a sheet to a position over a pile position and a return run through which said sheet gripping mechanism moves in a direction opposite said delivery run, said return run including a generally vertical section through which said sheet gripping mechanism moves downwardly, first gripper release means for effecting release of a sheet from said gripping mechanism at said pile position, a sheet delivery station along said vertical section of said return run, means providing for selective delivery of a sheet to said delivery station including control means for rendering said first sheet release means ineffective to release a sheet at said pile position, second gripper release means independent of said first gripper release means for effecting release of a sheet from said gripping mechanism along said vertical section, and means for guiding a sheet released from said gripping mechanism away from said return run.

12. An apparatus as defined in claim 11 wherein sheet stripper fingers are supported adjacent said vertical section to guide a released freely falling sheet outwardly of the conveyor path and receptacle means is provided for receiving the sheet from the stripper fingers and supporting the sheet at the delivery station.

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