Jan. 10, 1956 D. L. HARRISON 2,730,044

SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

Filed Oct. 19, 1951 10 Sheets-Sheet 1

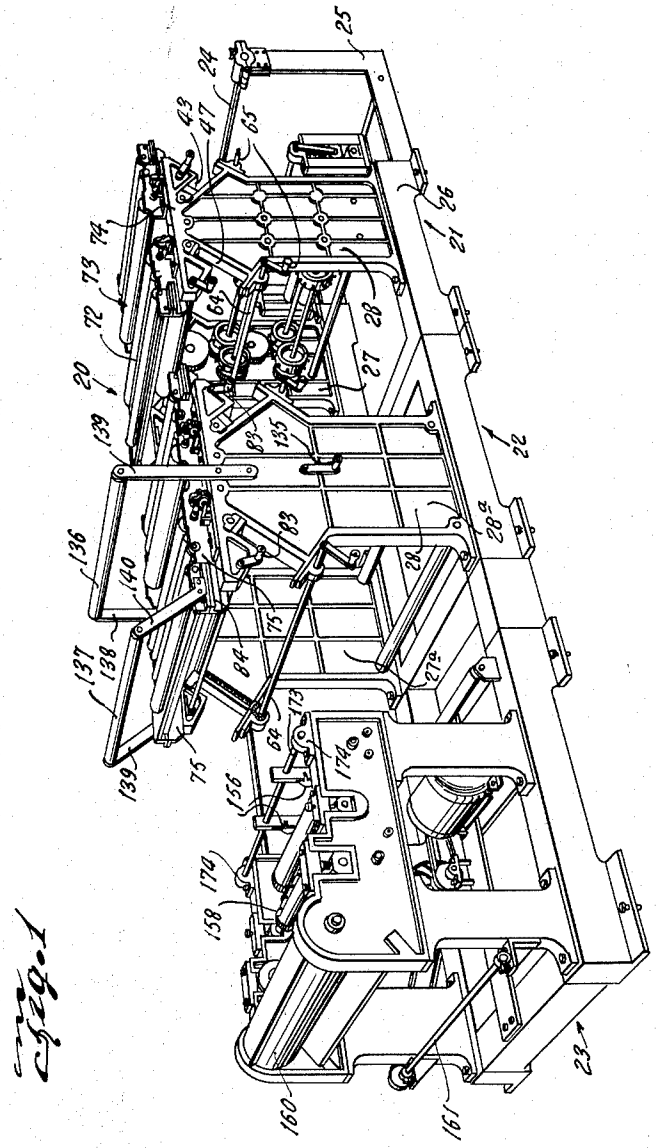



Fig. 1

DEWEY L. HARRISON
INVENTOR.

BY Ernest G. Ford

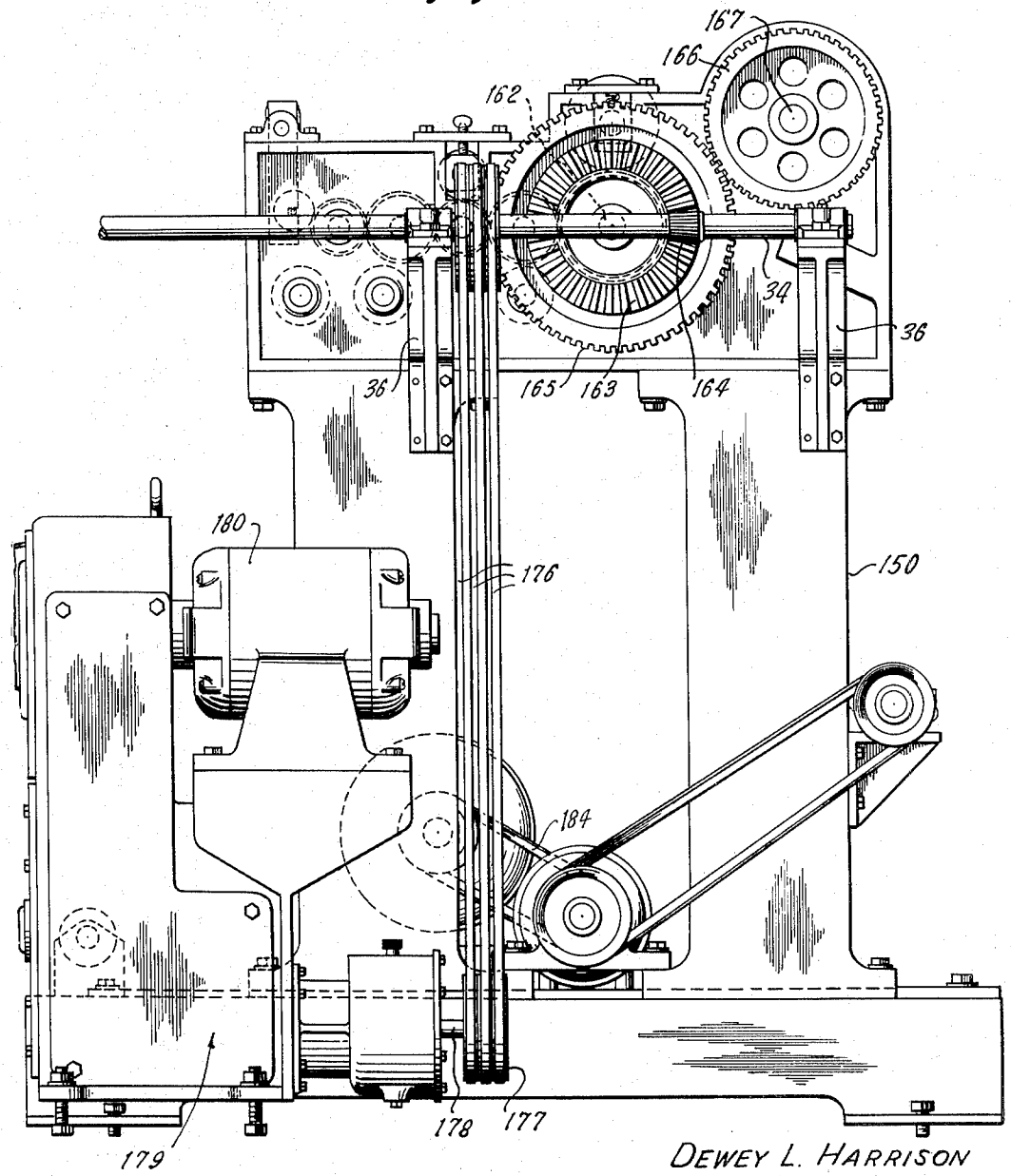
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SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 2




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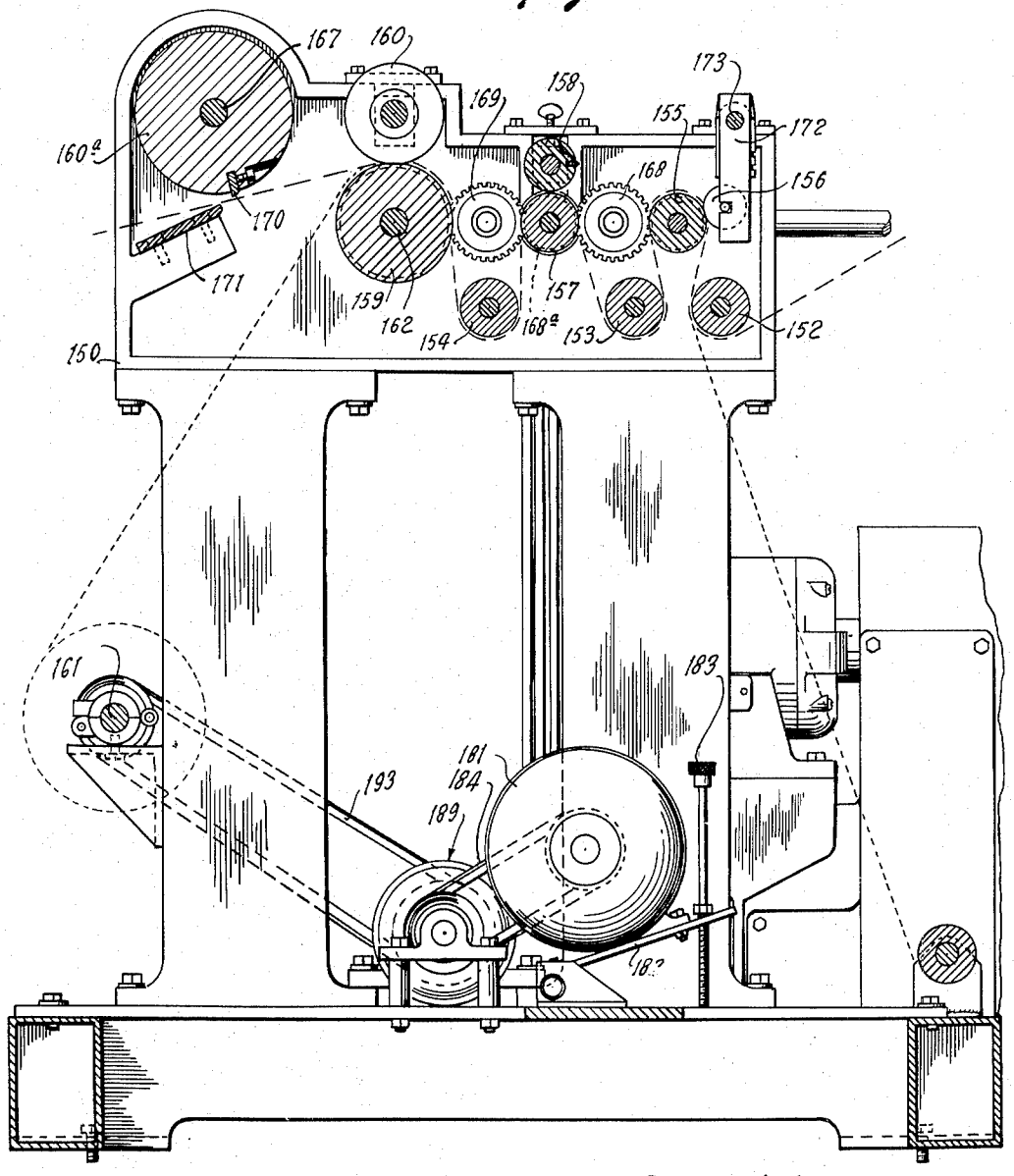
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Jan. 10, 1956 D. L. HARRISON 2,730,044

SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 3




DEWEY L. HARRISON
INVENTOR.

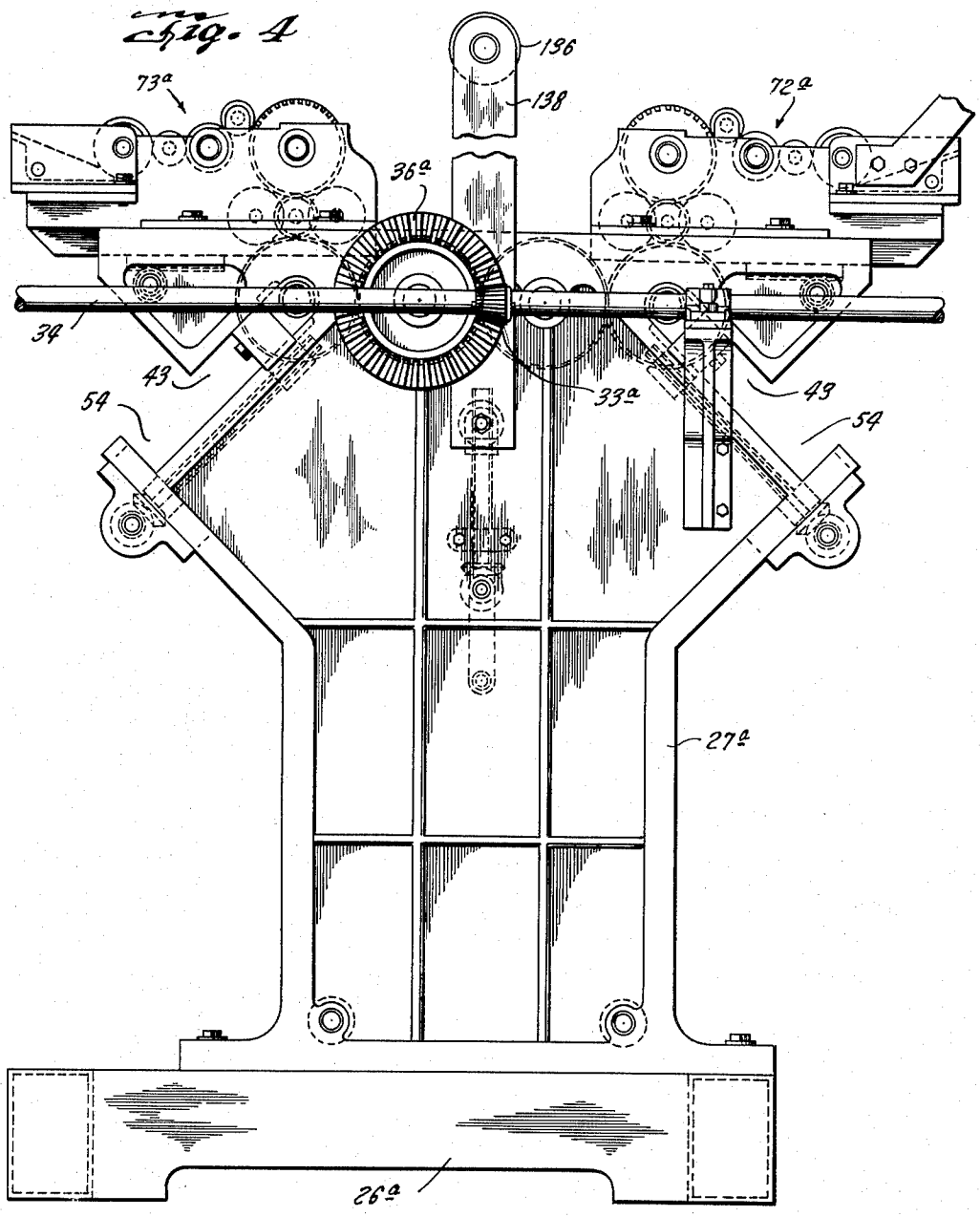
BY Forrest E. Ford
ATTORNEY

Jan. 10, 1956 D. L. HARRISON 2,730,044

SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 4




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BY Lowell S. Hoad

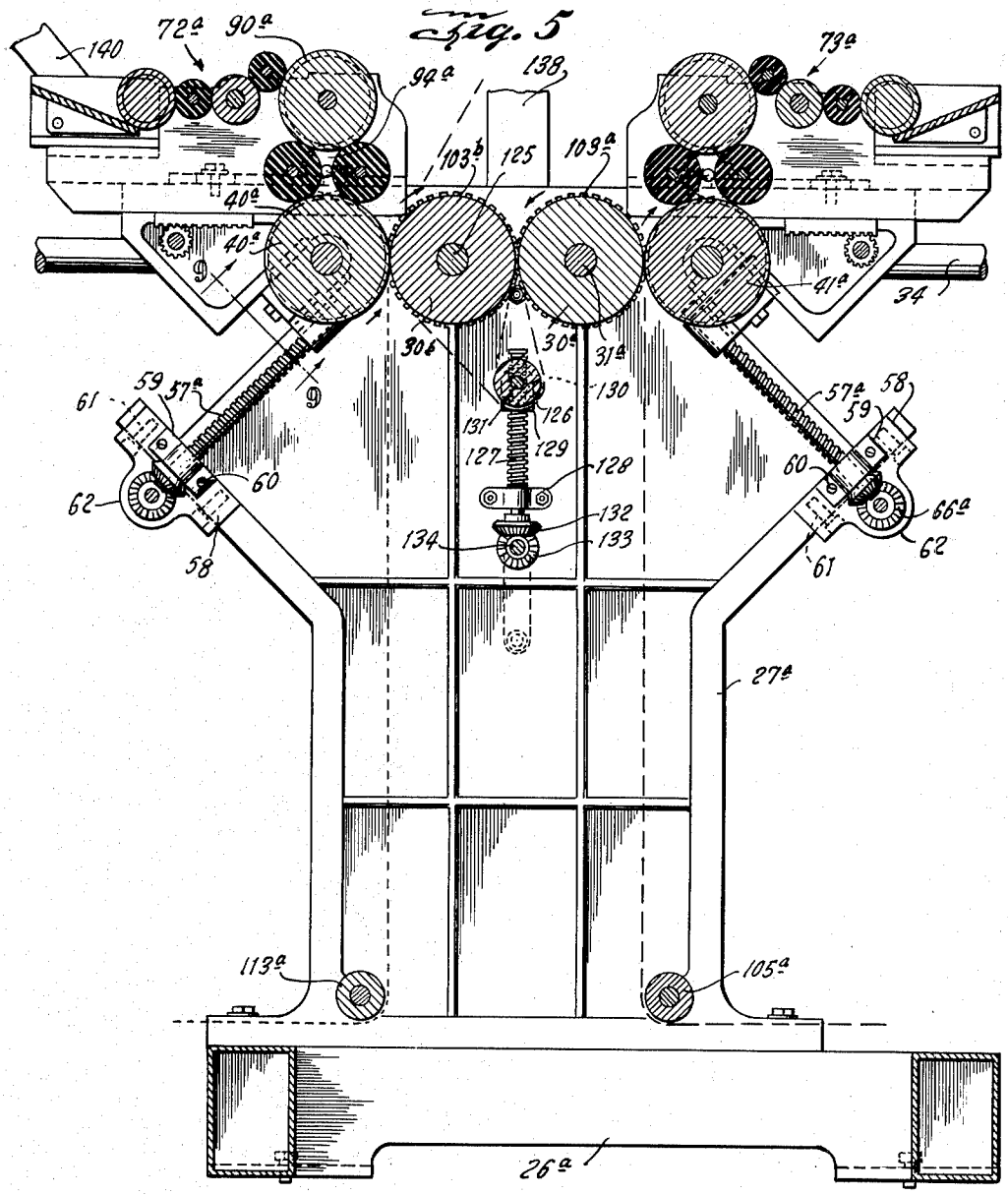
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SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 5




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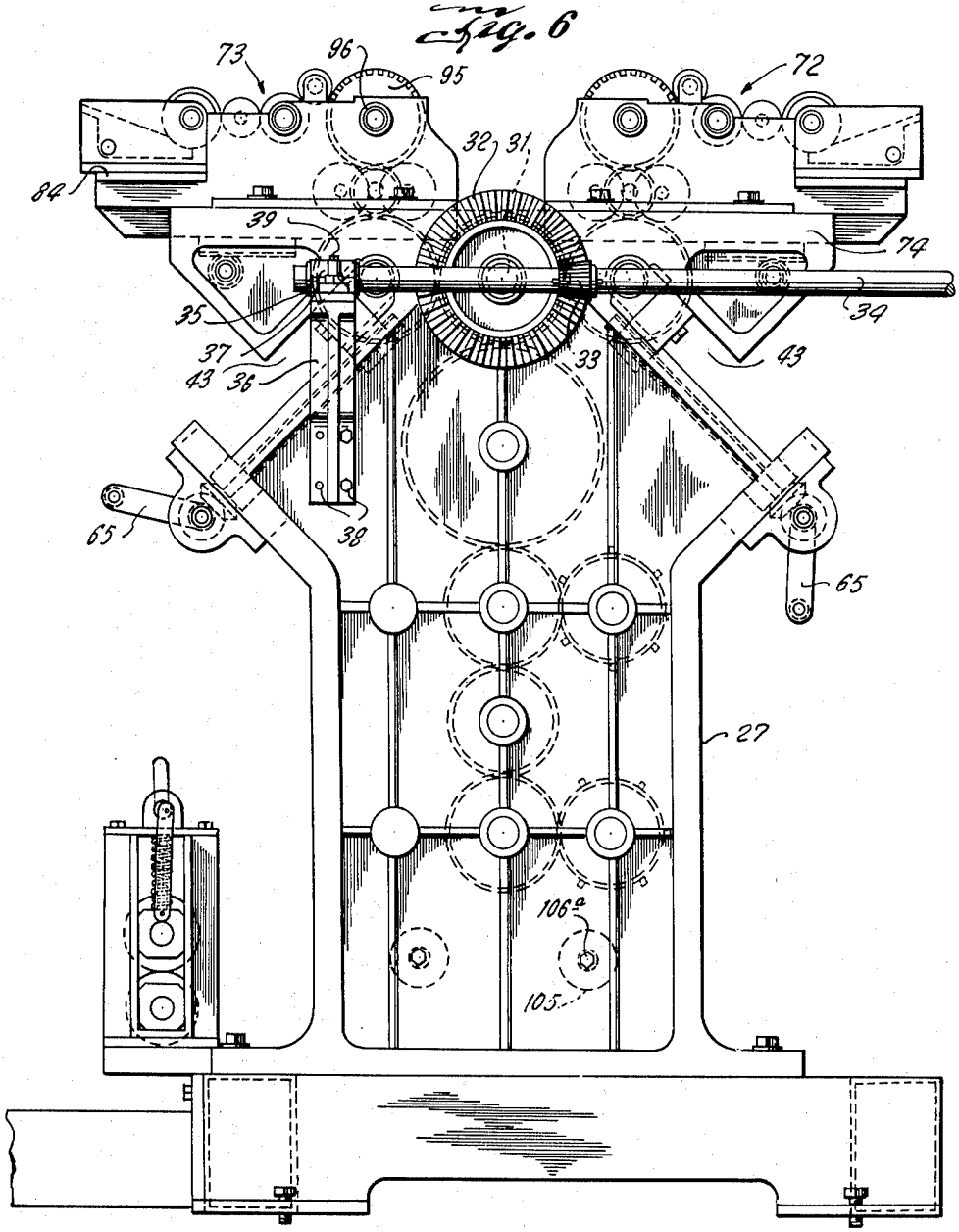
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SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 6




DEWEY L. HARRISON
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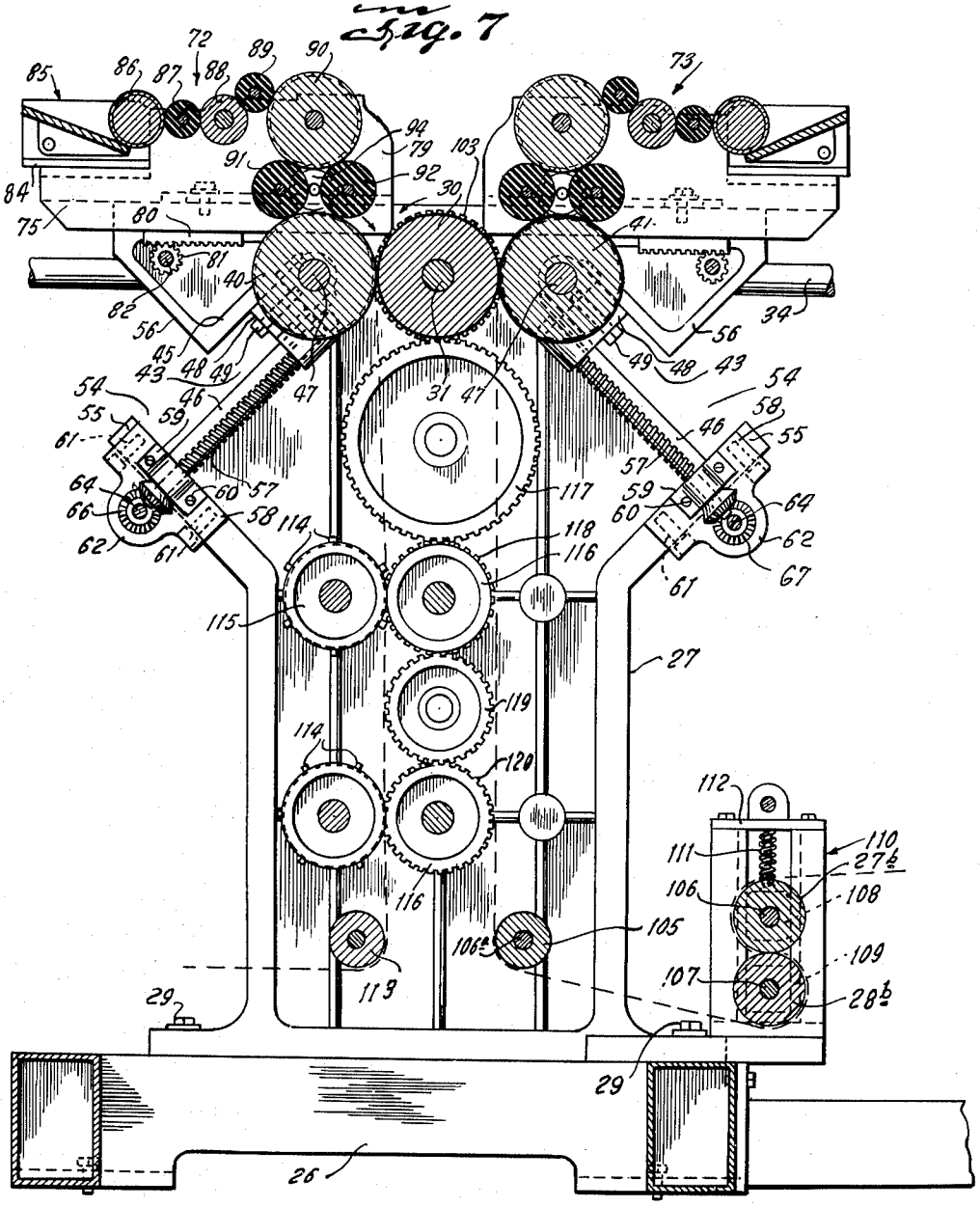
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SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 7




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BY Somers S. Ford

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SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 9

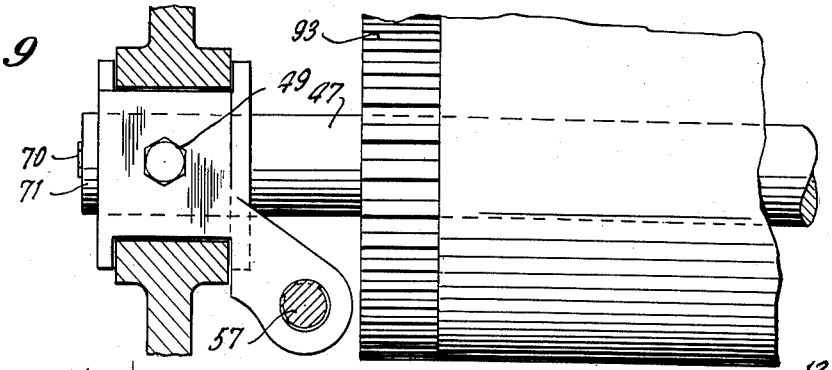
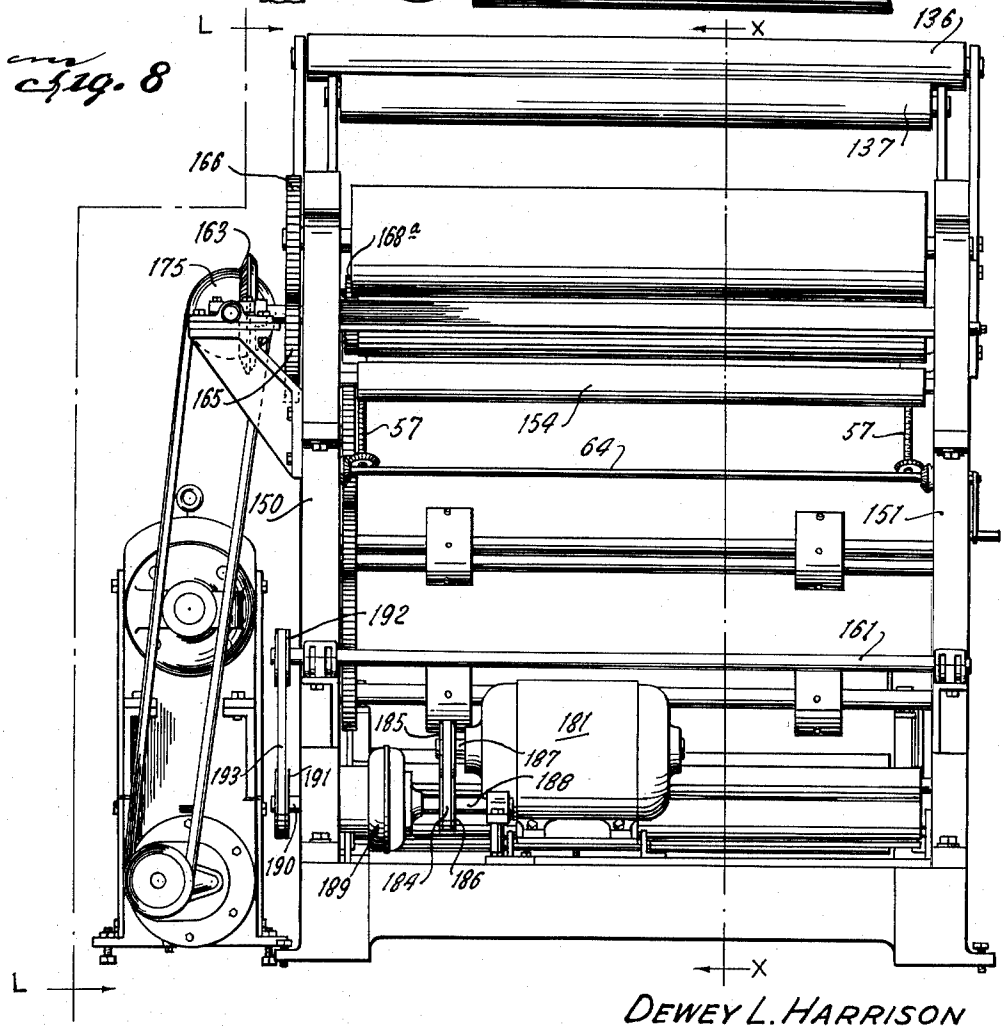



Fig. 8




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SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 10

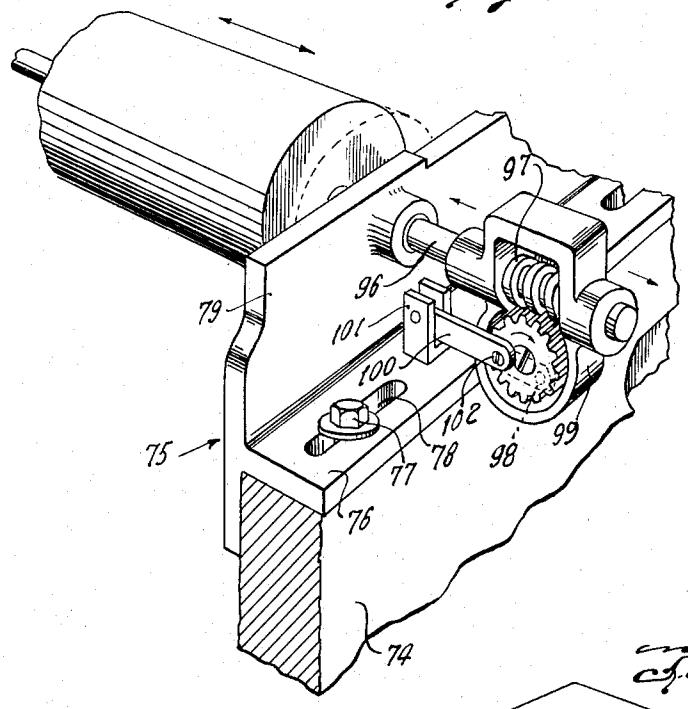



Fig. 12

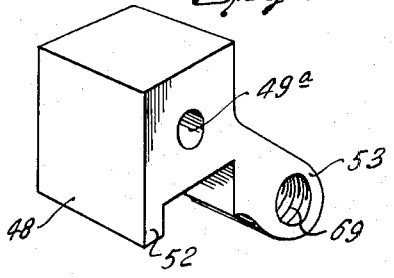
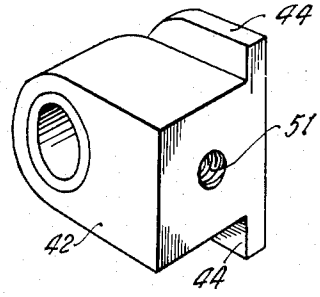



Fig. 11




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Jan. 10, 1956 D. L. HARRISON 2,730,044

SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

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Fig. 14

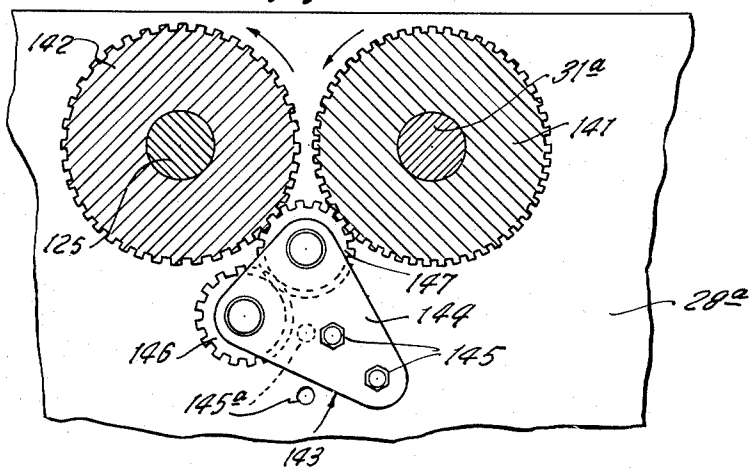
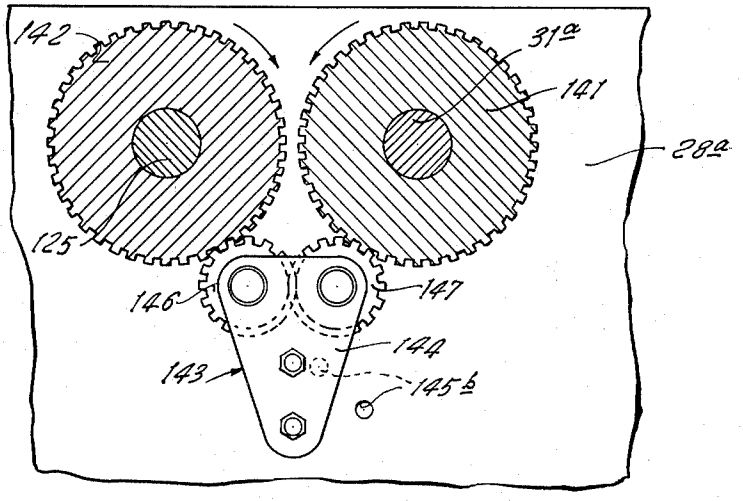



Fig. 13




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BY

ATTORNEY

United States Patent Office 2,730,044 Patented Jan. 10, 1956



2,730,044

# SLOTTED FRAME CONSTRUCTION FOR ROTARY PRINTING PRESS

Dewey L. Harrison, Grand Prairie, Tex.

Application October 19, 1951, Serial No. 252,083

12 Claims. (Cl. 101—181)

This invention relates to rotary printing presses and more particularly to rotary printing presses in which plate cylinders of varying diameters may be used with a minimum change and adjustment of parts and with a minimum expenditure of time.

Rotary printing presses, such as those employed to print in two or more colors on a continuous web or strip of paper or other material passing through the press, are provided with plate cylinders each of which coacts with an impression cylinder to print on a web or strip of paper which passes between the cylinders as they are rotated. The plate cylinders are inked by any suitable mechanism. It is desirable in such rotary printing presses that the plate cylinders be easily removable since different cylinders must be used at different times. Since the plate cylinders may be of different diameters, the plate cylinders should be adjustable relative to their associated impression cylinders and to their associated inking mechanisms. In addition, it is desirable in some instances that the rotary press be capable of printing on either side of the web or strip of paper or on both sides. Moreover, it is further desirable that the printing press should be easily adapted to print in two, four or more colors.

Accordingly, it is an object of this invention to provide a new and improved rotary printing press.

It is another object of this invention to provide a new and improved rotary printing press having means for easily and quickly changing plate cylinders.

It is still another object of the invention to provide a new and improved rotary printing press having means for easily and quickly adjusting plate cylinders relative to their associated impression cylinders.

It is a further object of the invention to provide a new and improved rotary printing press for printing on either or both sides of a web of paper or other material.

It is a still further object of the invention to provide a new and improved rotary printing press for printing on either side or both of a web in a number of colors.

It is another object of the invention to provide a new and improved rotary printing press having an inking mechanism which is easily adjustable relative to its associated plate cylinder.

Briefly stated, my new and improved rotary printing press may include a plurality of aligned printing bays and a perforating and cutting or coiling bay which are driven by motors mounted on the perforating and cutting or coiling bay. Each of the printing bays comprises a pair of parallel vertical frames mounted on a base. At least one impression roller and two plate cylinders are mounted on and between the frames. The opposite ends of the plate cylinders are rotatably mounted in bearing blocks which are disposed in aligned L-shaped slots having an open end provided in the ends of the frames, the bearing blocks being removable through the open ends of the slots. A worm gear drive is provided for each bearing block to provide means for adjustably moving the plate cylinders toward their associated impression cylinders. Inking mechanisms are adjustably mounted on and between each pair of frames for movement relative to their associated plate cylinders so that the inking mechanism of each plate cylinder may be adjusted to provide proper inking after the plate cylinder has been properly positioned with respect to its associated impression cylinder. The various cylinders and the perforating cutting mechanisms are driven from a common main driving shaft connected to a motor mounted on the perforating and cutting bay. A separate motor is provided for driving the coiling mechanism.

One of the bays may be provided with two impression rollers each having an associated plate cylinder. A compensating roller is mounted between and spaced from the two impression rollers to reverse the direction of movement of the web after it leaves one impression cylinder and before it arrives at the other impression cylinder. The compensating roller is also employed to insure that the printing of the two plate cylinders on the web is precisely aligned. In one embodiment of the invention, the direction of rotation of one impression cylinder may be selectively reversed so that the associated plate cylinder selectively may print on either side of the web.

For a better understanding of the invention, reference may be had to the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing,

Figure 1 is a perspective view of a rotary printing press assembly having two printing bays and a perforating and cutting or coiling bay;

Figure 2 is a side plan view of the perforating and cutting or coiling bay taken on the line L—L of Figure 8;

Figure 3 is a sectional view of the perforating and cutting or coiling bay taken on the line X—X of Figure 8;

Figure 4 is a side plan view of the middle printing bay taken on the line L—L of Figure 8;

Figure 5 is a sectional view of the middle printing bay taken on the lne X—X of Figure 8;

Figure 6 is a side plan view of the end printing bay taken on the line L—L of Figure 8;

Figure 7 is a sectional view of the end printing bay taken on the line X—X of Figure 8;

Figure 8 is an end plan view of the rotary printing press assembly;

Figure 9 is a fragmentary sectional view showing the mounting of a plate cylinder bearing in an L-shaped slot of a bay side frame;

Figure 10 is a fragmentary perspective view showing the means for reciprocating one of the inking rollers of each inking mechanism;

Figure 11 is a perspective view of a bearing block for a plate cylinder;

Figure 12 is a perspective view of the block employed to support each bearing block;

Figure 13 is a fragmentary plan view of a mechanism for reversing the direction of rotation of one impression roller relative to another; and,

Figure 14 is a plan view of the mechanism illustrated in Figure 13 with the elements shown in a changed position.

Referring now to the drawing, the rotary printing press assembly **20** includes an end printing press bay **21**, a middle printing press bay **22** and a perforating and cutting or coiling bay **23**. The web of paper or other material is uncoiled off a roll of paper rotatably mounted on the shaft **24** which is rotatably mounted on a frame **25** secured to the rectangular base **26** of the

end bay 21. The web then passes over a pair of straightening rollers 27*b* and 28*b* and thence through the bays 21 and 22 where the web is printed in two or more colors. From the middle bay 22, the printed web passes to the perforating and cutting or coiling bay 23 where the web is perforated both longitudinally and transversely and then either cut into sheets or coiled again into a roll.

The bay 21 comprises a pair of side frames 27 and 28 which are rigidly secured to the base 26 by bolts 29. An impression roller 30 extends transversely between the side frames and has a shaft 31 whose opposite ends are journaled in the side frames. A bevel gear 32 is rigidly secured to the end of the shaft 31 which projects outwardly beyond the side frame 27. The gear 32 is driven by a meshing gear 33 rigidly secured to a horizontal main driving shaft 34 one of whose ends extends through a bearing 35 clamped to a bearing support 36 by a bracket 37. The bearing support is secured to the side frame 27 by bolts 38 while the bracket 37 is secured to the bearing support by bolts 39.

A pair of plate cylinders 40 and 41 are also mounted on the side frames 27 and 28 by means of bearing blocks 42 which are adapted to be slidably disposed in aligned slots 43 in the side frames. Each bearing block 42 has inner side flanges 44 which are adapted to abut the inner side flanges 45 and 46 of the side frame 27 which lie adjacent the slots 43. The plate cylinders are mounted on shafts 47 whose ends extend through the bearing blocks.

Each bearing block 42 rests on and is secured to a support block 48 by a bolt 49 which extends through a suitable aperture 49*a* in the support block and into a threaded bore 51 in the bearing block. The support blocks 48 have a flange 52 and an ear 53 which lie on opposite sides of the flange 46 defining one side of the slot 43. The support blocks 48 are thus free to slide up and down on the flanges 46 but the flange 52 and ear 53 prevent lateral movement of the supporting blocks relative to the side frames. The support block 48 and the bearing block 42 may be removed from the slot 43 through the upward opening end 54 of the slot which is formed by the flange 55 extending at an angle from the flange 46 and the flange 56 extending at an angle from the flange 45.

The support block 42 in each slot 43 is adjustably movable in the slot between the flanges 45 and 46 by a screw 57 whose lower end is rotatably held between a bearing block 58 and a bracket 59 which is rigidly secured to the bearing block 58 by screws or bolts 60. The bearing block 58 is rigidly secured to the outer side of the flange 55 by bolts 61 extending into threaded bores in the flange 55. The bearing block 58 is also provided with an extension 62 having a suitable aperture in which is journaled a shaft 64. The shaft 64 is journaled in aligned extensions 62 of the bearing blocks 58 secured to aligned flanges 55 of the side frames 27 and 28. The end shaft 64 extending beyond the side frame 28 is provided with a handle 65. Each shaft 64 is also provided with a pair of bevel gears 66, one of which can be seen in Figure 7, which mesh with bevel gears 67 secured to the lower ends of the screws 57 associated with the plate cylinders 40 and 41 so that rotation of the left shaft 64, will move the supporting blocks 48 in the aligned slots 43 at the left ends of the side frames 27 and 28 up or down on their respective flanges 46 to advance the plate cylinder 40 at an angle toward or away from the impression cylinder 30. Rotation of the shaft 64 at the right ends, Figure 7, of the side frames 27 and 28 will similarly move the plate cylinder 41 toward and away from the impression cylinder 30.

If it is desired to replace one of the plate cylinders, the bolts 49 securing the bearing blocks 42, in which its shaft 47 is journaled, to the supporting blocks 48 are unscrewed and removed. The handle 65 of the associated shaft 64 is then rotated to rotate the screws 57, which pass through the threaded bores 69 in the ears 53 of the supporting blocks 48, to lower the supporting blocks until their bottom sides abut their associated flanges 55. The bearing blocks 42 are then disposed between the upper flange 56 and the supporting blocks 48, so that the bearing blocks may be moved out through the open ends 54 of aligned slots 43 in the side frames 27 and 28. The bearing blocks 42 can then be removed from opposite ends of the shaft 47 by unscrewing the bolts 70 threaded into the ends of the shaft 47 which hold washers 71 against the outer sides of the bearing blocks 42 to limit lateral movement of the shaft 47 in its bearing blocks. The bearing blocks 42 can then be placed on the shaft 47 of a new plate cylinder and again placed on their supporting blocks 48 through the open ends 54 of the slots 43. The shaft 64 is again rotated to raise the supporting blocks in the slots 43 and the bolts 49 are replaced to rigidly secure the bearing blocks 42 to the supporting blocks. The bolts 70 and washers 71 may then be replaced and the shaft 64 again rotated until the new plate cylinder bears properly against the impression cylinder 30. It will be noted that if the new plate cylinder is of greater diameter than the one which it replaces, the bearing blocks 42 will not be raised as high as previously. If the new plate cylinder is of smaller diameter, the bearing blocks 42 will be raised higher than previously. The exact position of the plate cylinder relative to the impression roller can thus be easily and quickly adjusted. The plate cylinders can also be easily removed and replaced in a matter of minutes in the manner described above.

A pair of inking mechanisms 72 and 73 are mounted on the top flanges 74 of the side frames 27 and 28 to ink the plate cylinders 40 and 41, respectively. Since the inking mechanisms 72 and 73 are substantially identical, only one of the mechanisms will be described in detail. Each inking mechanism includes a pair of aligned brackets 75, one on the top flange 74 of each side frame 27 and 28, which has a horizontal flange 76 resting on a top flange 74 and movably secured to it by bolts 77 which extend through elongated slots 78 in the horizontal flange 76 into suitable threaded bores in the flange 74. The bracket 75 also has a vertical flange 79 whose lower portion abuts the inner side face of the flange 74. A rack gear 80 integral with each bracket 75 meshes with a gear 81 on a shaft 82 journaled in the side frames 27 and 28. Each shaft 82, of course, carries two gears 81 to mesh with the rack gears of the two aligned brackets 75 on opposite ends of the top flanges 74 of the side frames 27 and 28. The shafts 82 are provided with handles 83 so that rotation of a handle 83 will move its associated brackets 75 inwardly or outwardly on the side frames 27 and 28. The bolts 77 may be tightened to hold the brackets 75 rigidly and immovably once the inking mechanism 72 or 73 has been properly adjusted relative to its plate cylinder 40 or 41, respectively.

Each bracket 75 has another supporting horizontal flange 84 and a conventional ink reservoir 85 is mounted on the flanges 84 of aligned brackets on the side frames. A plurality of abutting ink rollers 86, 87, 88 and 89 convey ink from the reservoir 85 to a reciprocating roller 90 which contacts a pair of rollers 91 and 92 which also contact the plate cylinder 40. The ink rollers are journaled in the horizontal flanges 79 of aligned brackets 75 on the side frames. The reciprocating roller 90 is rotated by means of a gear 93 on the shaft 47 of its associated plate cylinder, a gear 94 journaled in the horizontal flange 79 of bracket 75, and a gear 95 mounted on the shaft 96 on which the roller 90 is mounted. It will be apparent then that the shaft 96 and roller 90 will rotate whenever their associated plate cylinder rotates.

The shaft 96 extends through the flange 79 of one of the pair of brackets 75 which supports it and is pro-

vided adjacent its outer end with a worm **97**. A gear **98** rotatably mounted in a housing **99** on the shaft **96** meshes with the worm and is rotated thereby. A link **100** has one end pivotally secured to a bracket **101** on the flange **76** and its other end pivotally secured to the gear **98** as at **102**. It will be apparent that as the shaft **96** is rotated, the worm **97** will rotate the gear **98**, and since the link is secured to the gear at an off-center point, the housing **99** and the shaft **96** will be reciprocated in the manner indicated by the arrows in Figure 10. Reciprocatory movement of roller **96** insures even distribution of ink on the plate cylinder.

The plate cylinders **40** and **41** are rotated in a clockwise direction by a gear **103** mounted on the shaft **31** which meshes with the gear **93** on the shaft **47** of each cylinder. The web of paper or other material is uncoiled off a roll rotatably mounted on the shaft **24** and passes over the roller **27***b*, between the rollers **27***b* and **28***b*, under roller **28***b* and then around a direction changing roller **105** having a shaft **106***a* whose ends are journaled in the side frames **27** and **28**. The rollers **27***b* and **28***b* have shafts **106** and **107** whose ends are supported in bearing blocks **108** and **109**, respectively, vertically slidably mounted in a bracket assembly **110**. The roller **27** is yieldingly biased toward the roller **28** by a spring **111** which bears against the block **108** and a top member **112** of the bracket **110**.

After passing around the direction changing roller **105** the web passes upwardly between the plate cylinder **41** and the impression roller **30**. In thus passing between the impression and plate cylinders, the web has imprinted thereon lettering, a design or a solid shade depending on the type of surface with which the plate cylinder **41** is provided. The color of the lettering, design or solid shade imprinted on the web will depend on the color of the ink held in the reservoir of the inking mechanism **73**. After the plate cylinder **41** has printed on the web, it passes between the plate cylinder **40** and the impression cylinder **30** and in so passing has printed on it a lettering, design or solid shade whose color depends on the color of the ink in the reservoir of the inking mechanism **72**. It will be apparent that two colors have been printed on the same side of the web. The rotation of the two plate cylinders being synchronized, since the gears **93** of both plate cylinders mesh with the common gear **103**, the two colors of printing will be in predetermined relation on the web. After passing between the impression cylinder **30** and the plate cylinder **40**, the web passes around another direction changing roller **113** mounted on the side frames in the same manner as the roller **105**. The web may now pass to the middle bay **22** for further printing operations.

The web may have holes punched in it as it passes down from the plate cylinder **40** in the conventional manner by punches **114** on rotatable disks **115** which engage in suitable apertures in dies **116**. The dies are rotated by a suitable train of gears **117**, **118**, **119** and **120** which are driven from the gear **103** on the shaft **31**. The perforations may be made along both edges of the web as can be seen in Figure 1.

It will be apparent now that the end bay **21** has been described in which a pair of plate cylinders **40** and **41** are employed to print two colors on one side of a web drawn through the end bay. Moreover, the plate cylinders of the end bay adjustably and removably mounted on the side frames **27** and **28** by means of the screws **57**, the supporting blocks **48** and the bearing blocks **42** which are slidably mounted in the L-shaped slots **43**. In addition, the inking mechanisms **72** and **73** provided for the plate cylinders **40** and **41**, respectively, are longitudinally adjustable on the side frames to allow the inking mechanism to be properly positioned to the plate cylinders regardless of the variations in the diameters of the plate cylinders employed.

The middle bay **22** is similar to the end bay **21** in that it has a pair of plate cylinders **40***a* and **41***a*, similar to the plate cylinders **40** and **41** of the end bay which are mounted in the same manner on the side frames **27***a* and **28***a*. The various elements of the middle bay **22** corresponding to elements of the end bay **21** have been supplied with the same reference numerals to which the subscript "*a*" has ben added. The middle bay **22** differs from the end bay **21** in that two impression cylinders **30***a* and **30***b* are provided in order that the plate cylinder **40***a* may print on the opposite side of the web from that on which the plate cylinder **41***a* prints. Thus both sides of the web may be printed.

The impression roller **30***b* is mounted on a shaft **125** journaled in the side frames **27***a* and **28***a* and its bear **103***b* meshes with the gear **103***a* of the impression cylinder **30***a* so that the two impression cylinders rotate in opposite directions, cylinder **30***a* clockwise and cylinder **30***b* counter-clockwise. The two cylinders are, of course, spaced apart a small distance to prevent contact therebetween.

A compensating roller **126** is mounted below the impression rollers for vertical movement by means of screws **127**, one on each side frame **27***a* and **28***a*. Each screw **127** is rotatably secured to its side frame by a block **128** bolted to the side frame and it extends through a threaded bore in a supporting block **129**, similar to the supporting block **48**, on which is mounted a bearing block **130**. The opposite ends of the shaft **131** extend into the bearing blocks **130** so that the compensating roller **126** moves up or down as the screws **127** are rotated. The lower end of each screw **127** is provided with a bevel gear **132** which meshes with a matching bevel gear **133** on a shaft **134** which is journaled in the side frames **27***a* and **28***a*. The shaft **134** terminates in a handle **135** by means of which it may be rotated.

The web of paper after passing about the direction changing roller **113** of the end bay **21** passes about the direction changing roller **105***a* of the middle bay and thence upwardly between the plate cylinder **41***a* and the impression roller **30***a*. The plate cylinder is inked by the inking mechanism **73***a* with ink of a third color so that one side of the web will now have printing in three colors. The web then passes, as indicated by the broken line, about the impression cylinder **30***a* to the compensating roller **126**. From the compensating roller, the web passes upwardly between the plate cylinder **40***a* and the impression cylinder **30***a* and thence up to and over direction changing rollers **136** and **137**. The plate cylinder **40***a* is inked by the inking mechanism **72***a* and prints on the opposite side of the web in any desired color depending on the color of the ink in the reservoir of the inking mechanism **72***a*. The compensating roller **126** may be adjusted to obtain a desired registry between the printing on the two sides of the web. The direction changing roller **136** is mounted on straps **138** and **139** secured to the side frames **27***a* and **28***a*, respectively, while the roller **137** is secured to the inking mechanism by straps **139** and **149**.

In Figures 13 and 14 is shown a modified form of the engagement of the impression rollers in which the gears **103***a* and **103***b* of the impression cylinders do not mesh, the driving connection between the shafts **31***a* and **125** of the impression cylinders being made through gears **141** and **142** on the shafts **31***a* and **125**, respectively. A direction of rotation changing mechanism **143** comprising a plate **144** is mounted on the outer side of the frame **28***a* by means of bolts **145** and a pair of meshing gears **146** and **147** rotatably mounted on the plate **144**. The bolts **145** may engage either in a pair of threaded bores **145***a*, as shown in Figure 13, or in a pair of threaded bores **145***b*, as shown in Figure 14, provided in the side frame **28***a*. When the plate **144** is in the position shown in Figure 13, the gears **146** and **147** mesh with the gears **142** and **141**, respectively, and the impression cylinders are rotated in the same man-

ner as indicated in Figure 5. When the plate 144 is moved to the position shown in Figure 14, however the direction of rotation of the impression roller 30*b* is reversed since the gear 147 will mesh with both bears 142 and 141. The web will then pass from the compensating roller upward about the impression roller 30*b* and then downward between the plate cylinder 40*a* and the impression roller 30*b* to the direction changing roller 113*a* as indicated by the dotted line in Figure 5. In this case, both plate cylinders 40*a* and 41*a* will print on the same side of the web. It will be evident that in this modification, the direction of rotation of the impression roller 30*b* can be easily reversed so that the plate cylinder 40*a* can selectively print on either side of the web. The gear 103*b* on the shaft 125 will, of course, be at all times in mesh with the gear 93 of the impression cylinder 40*a* so that its direction will also change in an appropriate manner. The gearing between the gear 93 of the plate cylinder 40*a* and the roller 90*a* of the inking mechanism 72*a* will, of course, also have to be changed in order to keep the roller 90*a* rotating in the same direction regardless of the direction of rotation of the plate cylinder 40*a*. This can be done by the substitution of two meshing gears (not shown) for the single gear 94*a* now meshing with the gears of the plate cylinder 40*a* and of the ink cylinder 90*a*.

It will be apparent now by selectively changing the direction of rotation of the plate cylinder 40*a*, the web may be printed in the middle bay either on one side with two different colors or be printed on both sides and that in former case the web passes over the rollers 136 and 137 to the bay 123 while in the latter case it passes about the roller 113*a* to the bay 23.

It will be apparent that any desired combination of the two different types of printing bays, having either one or two impression cylinders, can be arranged to print a web with as many colors as may be desired, either on one side only or on both sides. The common main driving shaft 34 keeps the various cylinders rotating in synchronism so that the various colors register properly on the web.

In passing through the bay 23, the web is perforated both longitudinally and transversely at desired predetermined intervals and then either cut into sheets of predetermined sizes or else coiled in a roll. The bay 23 has side frames 150 and 151 in which are journaled direction changing rollers 152, 153 and 154, a hard surfaced roller 155 with which the knives 156 cooperate to perforate the web longitudinally, another hardened roller 157 with which a knife 158 cooperates to perforate the web transversely at predetermined intervals, and a pair of drawing rollers 159 and 160 which pull the web either toward the cutter roller 160 or to a reel (not shown) on the shaft 151. The drawing roller 159 is mounted on a shaft 162 on which are also mounted a bevel gear 163 which meshes with a bevel gear 164 on the main driving shaft 34, and a ring gear 165 which meshes with a gear 166 mounted on the same shaft 167 as the cutter roll 160. The rollers 155 and 157 are provided with gears which mesh with the gears 168 rotatably mounted on the side frame 150. The gear 168*a* of roller 157 and a gear of roller 159 also mesh with a gear 169 rotatably mounted on the side frame 150 so that when the main shaft 34 is rotated the rollers 155, 157 and 159 also rotate.

The cutter roller 160*a* is provided with a conventional knife 170 which cooperates with a plate 171 to cut the web into sheets. The transverse perforating knives 156 are mounted in brackets 172 in the conventional manner, the brackets being mounted on a transverse shaft 173 whose ends are supported in bearing blocks 174 secured to the side frames.

The main shaft 34 is supported by the supports 36 and is provided with a plurality of pulleys 175 about which extend belts 176. The pulley belts 176 connect the main shaft to the pulleys 177 on the power take-off shaft 178 of a conventional transmission 179 driven by an electric motor 180.



The shaft 161 is also driven through a belt and pulley arrangement by a motor 181 mounted on a pivoted base 182 whose angular inclination may be adjusted by a screw 183 to vary the tension on the belt 184. The belt 184 connects the pulleys 185 and 186 on the motor shaft 187 and a shaft 188 of a transmission 189. The driving shaft 190 of the transmission 189 has a pulley 191 which is connected to the pulley 192 on the shaft 161 by a belt 193. When desired, the web is coiled on a reel, not shown, secured on the shaft 161 and for this reason the shaft 161 may be rotated by the motor 181.

It will now be apparent that the main shaft 34 being geared to all the rotatable elements of the printing bays and to all the rotatable elements, except the shaft 161, of the perforating and cutting bays, the operation of all the elements is synchronized to print the web in several registering colors, either on one or both sides, and to perforate and cut the web at appropriate intervals. If desired, the web may be coiled into a roll instead of being cut into sheets. Moreover, the printing bays are provided with plate cylinders which can be quickly and easily removed in the manner described.

It will be apparent to those skilled in the art that various changes and modifications can be made without departing from the invention and it is intended therefore in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A rotary printing press comprising: a pair of spaced parallel vertical side frames, a horizontal flange at the top of each of said frames, said horizontal flanges each having a depending V-shaped portion at each end thereof, an angular flange formed on each side of each of said side frames below and in parallelism with the inner surfaces of said V-shaped portion to define an open ended L-shaped slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned; an impression cylinder rotatably mounted on and between said side frames; bearing blocks slidably and adjustably mounted on said side frames in said slots, each of said bearing blocks being removable through the open end of its slot, and a plate cylinder rotatably mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly in said slots.

2. A rotary printing press comprising: a pair of spaced parallel vertical side frames, laterally projecting and vertically spaced portions on each side of each of said frames defining an open ended slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned; an impression cylinder rotatably mounted on and between said side frames; a bearing block slidably mounted in each of the slots of said side frames a screw parallel with each of said slots and connected to said bearing blocks for simultaneously moving said bearing blocks toward and away from said closed ends of said slots, said bearing blocks being removable through the open end of said slots; and a plate cylinder rotatably mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly toward said closed ends of said slots.

3. A rotary printing press comprising: a pair of spaced parallel vertical side frames, a V-shaped projection integral with and depending from the top of said frame, a lateral projection on each side of said frame having an angular flange confronting the inner surface of each of said V-shaped projections and defining an open ended slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned, an impression cylinder rotatably mounted on and between said side frames; a supporting block

slidably disposed in each of said slots for movement toward and away from the closed end of the slot, said block having a threaded bore; an elongate screw rotatably mounted on each frame and extending through the threaded bore of its associated supporting block, each of said supporting blocks moving toward and away from the closed end of its associated slot when its associated screw is rotated; means mounted on said frames for simultaneously rotating the screws on both of said frames; a bearing block mounted on each of said supporting blocks, each bearing block being removable from its slot through the open end of the slot; and a plate cylinder mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly toward said closed ends of said slots.

4. A rotary printing press comprising: a pair of spaced parallel vertical side frames, a V-shaped projection integral with and depending from each side of the top of each of said frames, a lateral projection integral with each side of each of said frames having angular flanges confronting the inner surfaces of said V-shaped projections and defining an open ended slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned, an impression cylinder rotatably mounted on and between said side frames; a supporting block slidably disposed in each of said slots for movement toward and away from the closed end of the slot, said block having a threaded bore; an elongate screw rotatably mounted on each frame and extending through the threaded bore of its associated supporting block, each of said supporting blocks moving toward and away from the closed end of its associated slot when its associated screw is rotated; a gear on each screw; a transverse shaft journaled in said shafts and provided with gears meshing with the gears on screws for simultaneously rotating both screws; a bearing block mounted on each of said supporting blocks, each bearing block being removable from its slot through the open end of the slot; and a plate cylinder mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly.

5. In a rotary printing press, a pair of parallel vertical spaced side frames, an upper horizontal surface, integral, V-shaped portions depending from each end of said horizontal surface, angular portions integral with each side of said frame and spaced below said V-shaped portions to define a substantially L-shaped slot opening at one end thereof and extending inclinedly downwardly and then inclinedly upwardly toward said horizontal upper surface and terminating short thereof; the slots of said side frames being aligned; an impression cylinder journaled in said side frames and extending transversely therebetween; bearing blocks slidably mounted on said side frames in said slots; a plate cylinder mounted on the bearing blocks; means for adjustably and simultaneously moving said bearing blocks upwardly in said slots to bring said plate cylinder toward said impression cylinder, said bearing blocks being removable from said slots through the open ends thereof, whereby said plate cylinder may be removed; and an inking mechanism for said plate cylinder slidably mounted on said upper horizontal surfaces of said side frames and movable in a horizontal plane toward said impression cylinder.

6. In a rotary printing press, a pair of parallel vertical spaced side frames, each of said side frames having an upper horizontal surface, an integral V-shaped portion depending from each end of said horizontal surface, a laterally extending portion on each side of said frame spaced below said V-shaped portion to define a slot opening at one end thereof and extending inclinedly downwardly and then inclinedly upwardly toward said horizontal upper surface and terminating short thereof; the slots of said side frames being aligned; an impression cylinder journaled in said frames and extending transversely therebetween; bearing blocks slidably mounted on said side frames in said slots; a plate cylinder mounted on the bearing blocks; means for adjustably and simultaneously moving said bearing blocks upwardly in said slots to bring said plate cylinder toward said impression cylinder, said bearing blocks being removable from said slots through the open ends thereof, whereby said plate cylinder may be removed; an inking mechanism for said plate cylinder mounted on said upper horizontal surfaces of said side frames and movable in a horizontal plane toward said impression cylinder; and means for adjustably moving said inking mechanism along said horizontal surfaces.

7. In a rotary printing press, a pair of parallel vertical spaced side frames, each of said side frames having an upper horizontal surface, an integral portion depending from each end of said horizontal surface forming an angular flange, a laterally extending portion on each side of said frame forming an angular flange confronting said first flange to define a slot opening at one end thereof and extending inclinedly downwardly and then inclinedly upwardly toward said horizontal upper surface and terminating short thereof; the slots of said side frames being aligned; an impression cylinder journaled in said side frames and extending transversely therebetween; bearing blocks slidably mounted on said side frames in said slots; a plate cylinder mounted on the bearing blocks; means for adjustably and simultaneously moving said bearing blocks upwardly in said slots to bring said plate cylinder toward said impression cylinder, said bearing blocks being removable from said slots through the open ends thereof, whereby said plate cylinder may be removed; an inking mechanism for said plate cylinder mounted on said upper horizontal surfaces of said side frames and movable in a horizontal plane toward said impression cylinder; and means for adjustably moving said inking mechanism along said horizontal surfaces, said last mentioned means comprising a rack and gear operatively associated with said inking mechanism and said side frames.

8. A rotary printing press comprising: a pair of spaced parallel vertical side frames, a member integral with and depending from each side of the top of said frame, each having an angular flange, a laterally extending portion integral with each side of said frame having an angular flange spaced below and parallel with said first angular flange to define an open ended slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned; an impression cylinder rotatably mounted on and between said side frames; a bearing block slidably mounted in each of said side frames and connected to said bearing blocks for simultaneously moving said bearing blocks toward and away from said closed ends of said slots, said bearing blocks being removable through the open end of said slots; a plate cylinder rotatably mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly toward said closed ends of said slots; and an inking mechanism for inking said plate cylinder mounted on said side frames for movement in a horizontal plane above said plate cylinder toward and away from said impression cylinder.

9. A rotary printing press comprising: a pair of spaced parallel vertical side frames, an angularly flanged portion depending from each side of the top of said frame, a laterally extending flanged portion on each side of said frame, the flanges of said depending and said laterally extending portions defining an open ended slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned, an impression cylinder rotatably mounted on and between said side frames; a supporting block slidably disposed in each of said slots for movement toward and away from the closed end of the slot, said block having a threaded bore; an elongate screw rotatably mounted on each frame

and extending through the threaded bore of its associated supporting block, each of said supporting blocks moving toward and away from the closed end of its associated slot when its associated screw is rotated; means mounted on said frames for simultaneously rotating the screws on both of said frames; a bearing block mounted on each of said supporting blocks, each bearing block being removable from its slot through the open end of the slot; a plate cylinder mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly toward said closed ends of said slots; and an inking mechanism for inking said plate cylinder mounted on said side frames for movement in a horizontal plane above said plate cylinder toward and away from said impression cylinder.

10. A rotary printing press comprising: a pair of spaced parallel vertical side frames, vertically spaced portions integral with each side of said frame having confronting angular flanges defining an open ended slot inclining downwardly from the open end and then inclining upwardly to the closed end, the slots in said frames being aligned, an impression cylinder rotatably mounted on and between said side frames; a supporting block slidably disposed in each of said slots for movement toward and away from the closed end of the slot, said block having a threaded bore; an elongate screw rotatably mounted on each frame and extending through the threaded bore of its associated supporting block, each of said supporting blocks moving toward and away from the closed end of its associated slot when its associated screw is rotated; a gear on each screw; a transverse shaft journaled in said shafts and provided with gears meshing with the gears on screws for simultaneously rotating both screws; a bearing block mounted on each of said supporting blocks, each bearing block being removable from its slot through the open end of the slot; a plate cylinder mounted on said bearing blocks and movable into contact with said impression cylinder when said bearing blocks are moved upwardly; and an inking mechanism for inking said plate cylinder mounted on said side frames for movement in a horizontal plane above said plate cylinder toward and away from said impression cylinder.

11. A rotary printing press comprising: a pair of spaced parallel vertical side frames, a pair of vertically spaced portions integral with each side of said frame, an angular flange on each of said portions between which is formed an open ended slot, each of said slots extending downwardly and inclined from its open end and then upward and inclinedly to its closed end, the slots in adjacent ends



of said side frames being aligned; transversely extending impression cylinder rotatably journaled in said side frames and disposed between said slots in opposite ends of said side frames; bearing blocks slidably and adjustably mounted on said side frames in said slots, each of said bearing blocks being removable through the open end of its slot; a plate cylinder mounted on the bearing blocks in each pair of aligned slots, said plate cylinders being movable upwardly toward opposite sides of said impression cylinder when said bearing blocks are moved upwardly in said slots; means for rotating said impression cylinder; and gear means connecting said impression cylinder to said plate cylinders for simultaneously rotating plate cylinders in opposite directions.

12. A rotary printing press comprising: a pair of spaced parallel vertical side frames, vertically spaced members formed integrally with each side of said frame to define therebetween an open ended slot, each of said slots extending downwardly and inclined from its open end and then upward and inclinedly to its closed end, the slots in adjacent ends of said side frames being aligned; transversely extending impression cylinder rotatably journaled in said side frames and disposed between said slots in opposite ends of said side frames; bearing blocks slidably and adjustably mounted on said side frames in said slots, each of said bearing blocks being removable through the open end of its slot; a plate cylinder mounted on the bearing blocks in each pair of aligned slots, said plate cylinders being movable upwardly toward opposite sides of said impression cylinder when said bearing blocks are moved upwardly in said slots; means for rotating said impression cylinder; gear means connecting said impression cylinder to said plate cylinders for simultaneously rotating plate cylinders in opposite directions; and a pair of inking mechanisms mounted adjacent opposite ends on said side frames for movement in a horizontal plane above said cylinders, each of said mechanisms inking an associated plate cylinder.

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