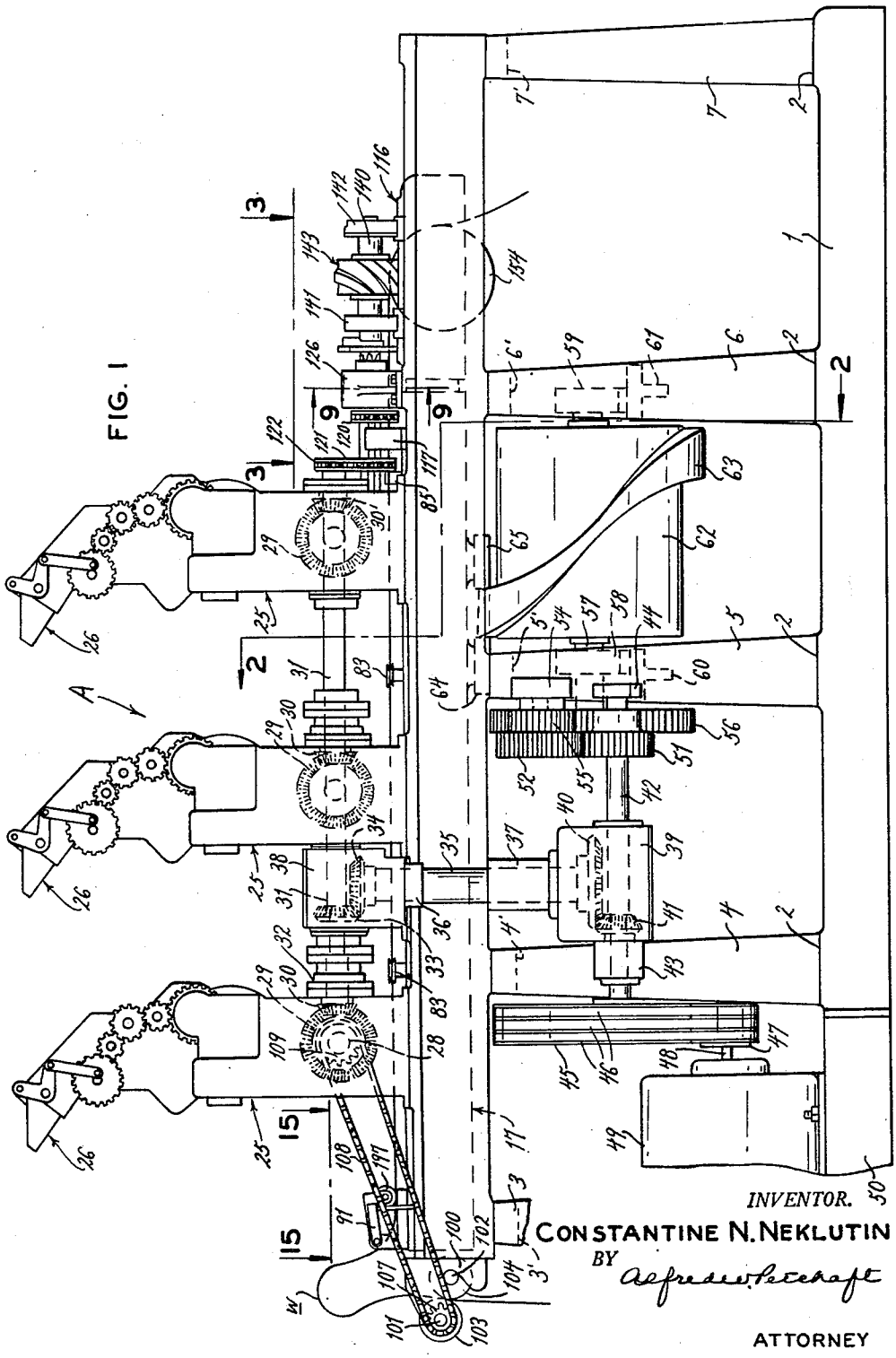
March 15, 1955 C. N. NEKLUTIN 2,704,027

MULTICOLOR OFFSET PRINTING PRESSES

Filed March 15, 1951 5 Sheets-Sheet 1

FIG. 1



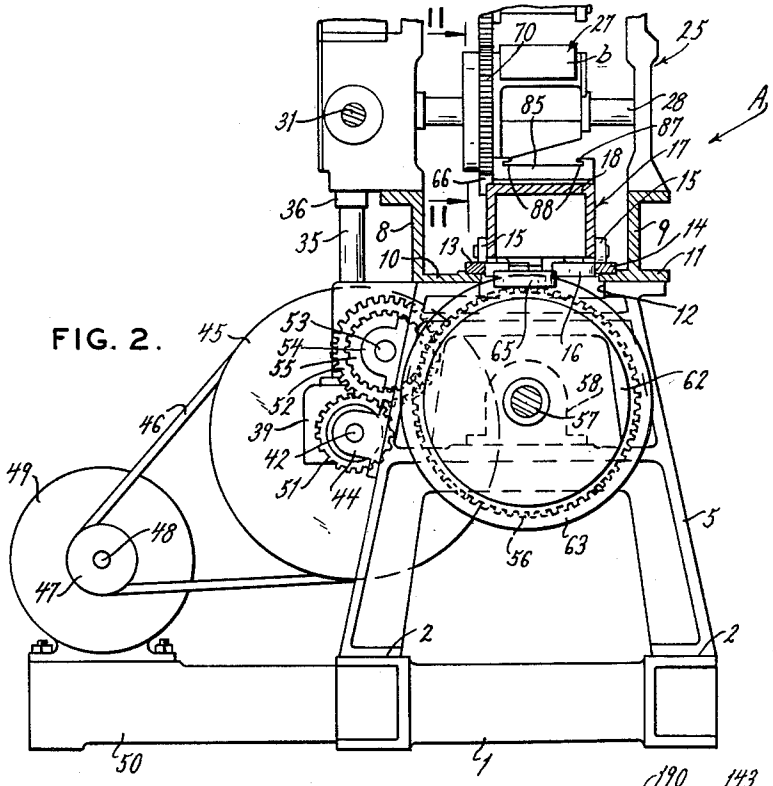
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BY Alfred W. Peterkoff
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March 15, 1955 C. N. NEKLUTIN 2,704,027

MULTICOLOR OFFSET PRINTING PRESSES

Filed March 15, 1951 5 Sheets-Sheet 2

FIG. 2.



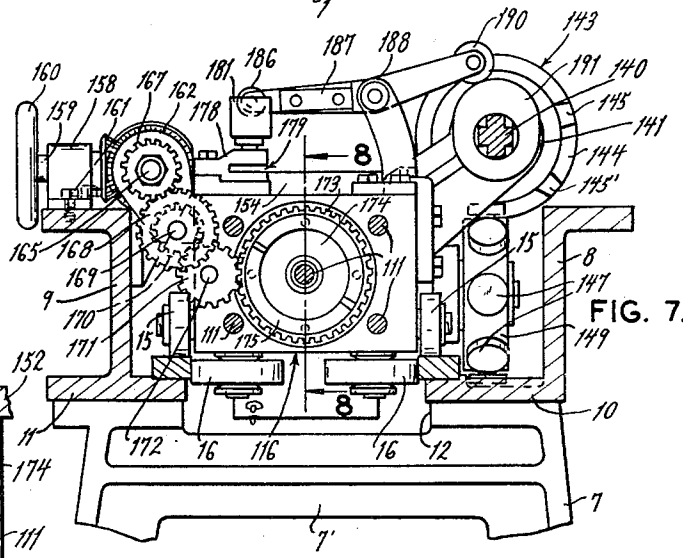


FIG. 7.

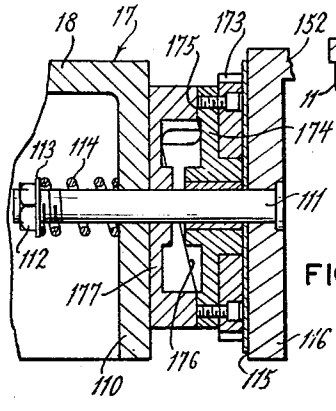


FIG. 8.

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MULTICOLOR OFFSET PRINTING PRESSES

Filed March 15, 1951 5 Sheets-Sheet 3

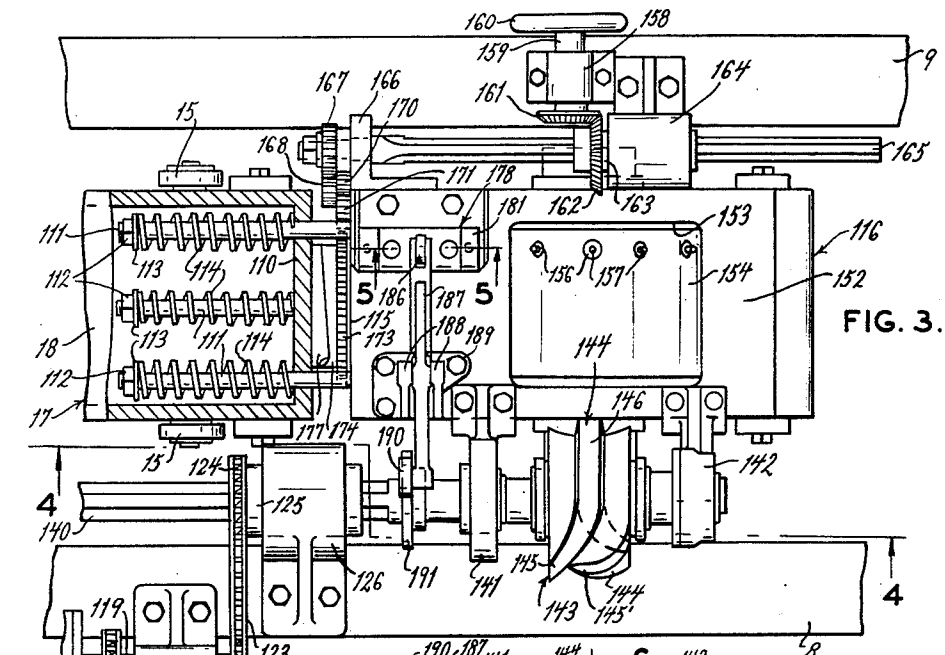


FIG. 3.

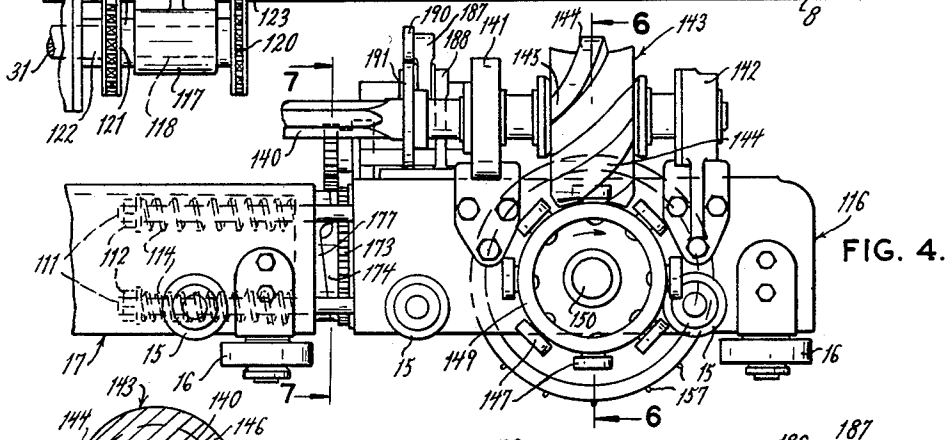


FIG. 4.

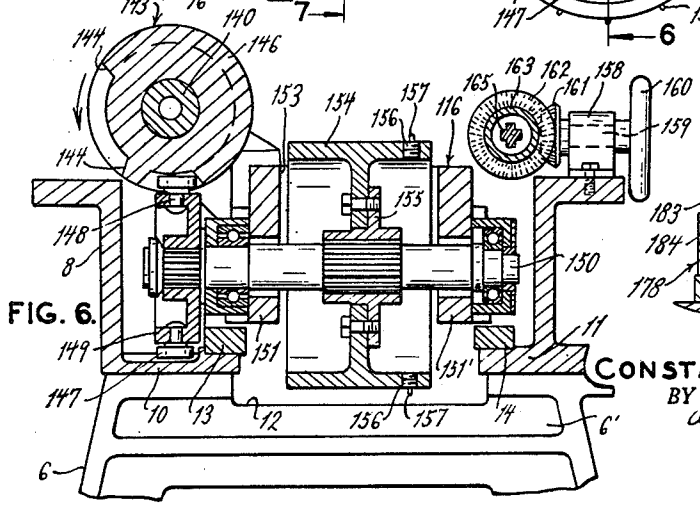


FIG. 6.

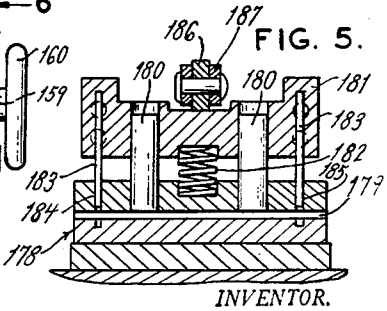


FIG. 5.

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MULTICOLOR OFFSET PRINTING PRESSES

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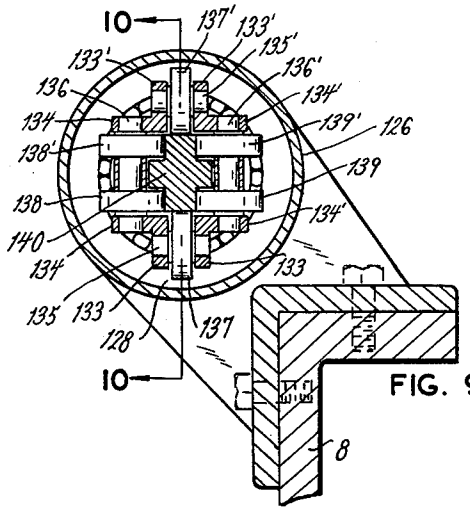


FIG. 9.

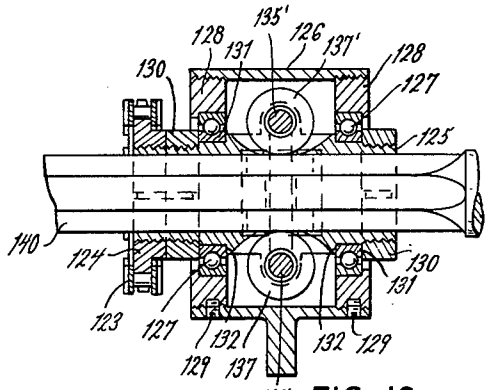


FIG. 10.

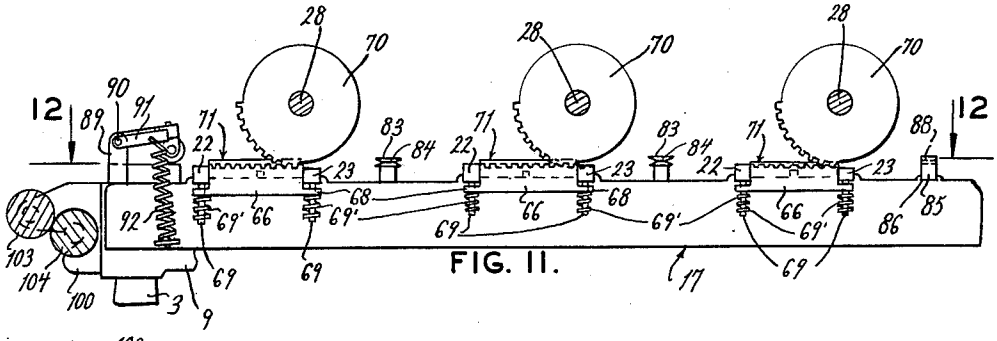


FIG. 11.

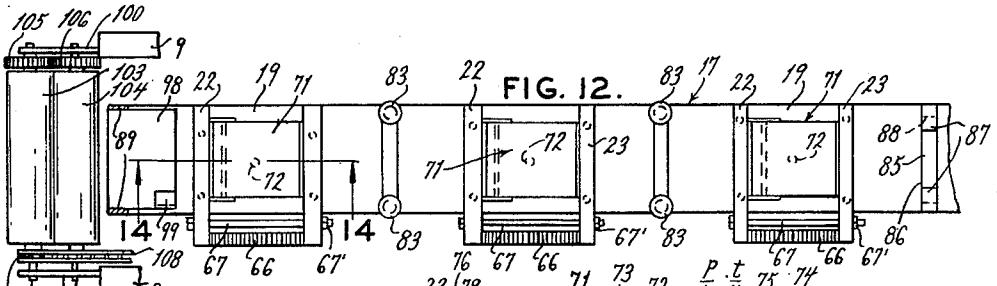


FIG. 12.

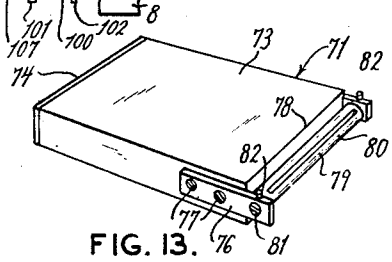


FIG. 13.

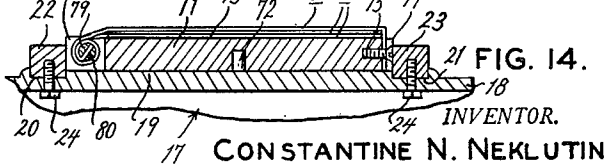


FIG. 14.

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March 15, 1955 C. N. NEKLUTIN 2,704,027

MULTICOLOR OFFSET PRINTING PRESSES

Filed March 15, 1951 5 Sheets-Sheet 5

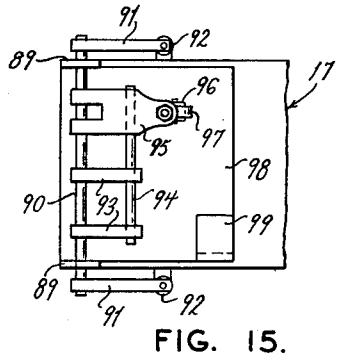


FIG. 15.

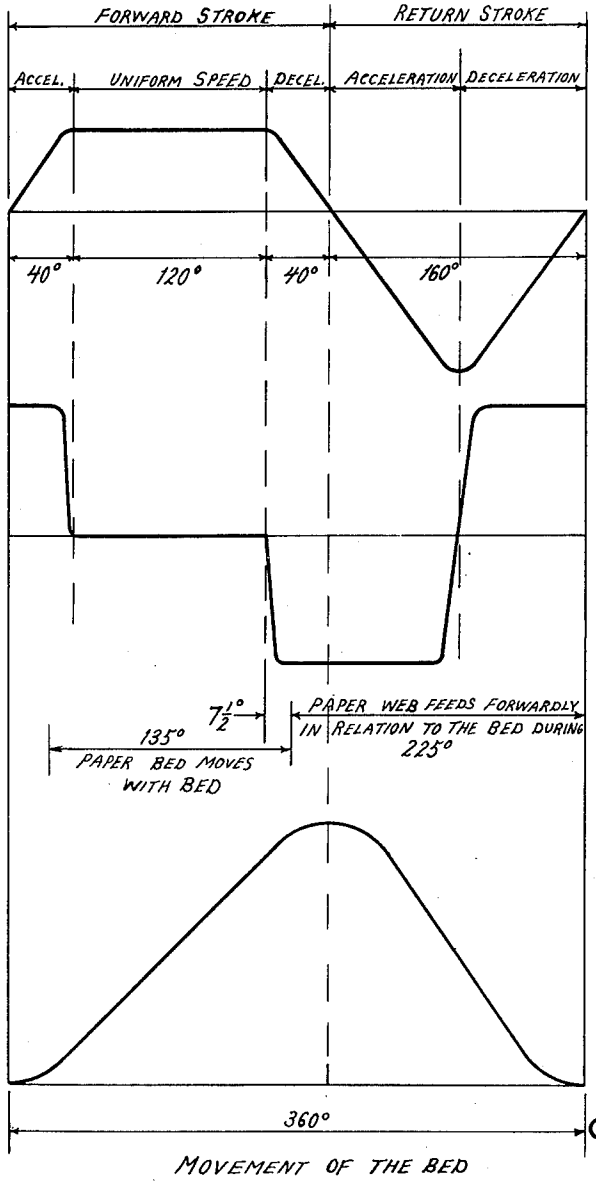


FIG. 16.

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United States Patent Office

2,704,027

Patented Mar. 15, 1955

2,704,027

MULTICOLOR OFFSET PRINTING PRESSES

Constantine N. Neklutin, Normandy, Mo., assignor to Universal Match Corporation, St. Louis, Mo., a corporation of Delaware

Application March 15, 1951, Serial No. 215,830

5 Claims. (Cl. 101—253)

It is the primary object of the present invention to provide a continuous web feeding offset press which is capable of maintaining a highly precise registration between the several successive imprints.

It is a further object of the present invention to provide a press of the type stated in which registration can be adjusted to a highly accurate degree while the press is in full motion.

It is also an object of the present invention to provide a press of the type stated which is capable of extremely high speed and continuous operation with minimum attention from the operator so that labor costs may be kept extremely low.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings—

Figure 1 is a side elevational view of a printing press constructed in accordance with and embodying the present invention;

Figures 2 and 3 are fragmentary sectional views taken along lines 2—2 and 3—3, respectively, of Figure 1;

Figures 4 and 5 are fragmentary sectional views taken along lines 4—4 and 5—5, respectively, of Figure 3;

Figures 6 and 7 are fragmentary sectional views taken along lines 6—6 and 7—7, respectively, of Figure 4;

Figure 8 is a fragmentary sectional view taken along line 8—8 of Figure 7;

Figure 9 is a fragmentary sectional view taken along line 9—9 of Figure 1;

Figure 10 is a fragmentary sectional view taken along line 10—10 of Figure 9;

Figure 11 is a fragmentary sectional view taken along line 11—11 of Figure 2;

Figure 12 is a fragmentary sectional view taken along line 12—12 of Figure 11;

Figure 13 is a perspective view of the removable impression platen forming a part of the present invention;

Figure 14 is a fragmentary sectional view taken along line 14—14 of Figure 12;

Figure 15 is a fragmentary sectional view taken along line 15—15 of Figure 1; and

Figure 16 is a schematic or graphic motion study showing the reciprocatory movements of the press.

Referring now in more detail and by reference characters to the drawings, which illustrate preferred embodiments of the present invention, A designates a multicolor offset printing press comprising a horizontal base-frame casting 1 adapted to be mounted securely upon the floor or other suitable supporting structure and being provided upon its upper face with a plurality of milled horizontal pad faces 2 upon which are mounted spaced parallel vertically upstanding leg frames 3, 4, 5, 6, 7, said frames integrally including horizontal cross members 3', 4', 5', 6', and 7', respectively, the latter being milled or otherwise machined upon their upper faces to receive and support horizontally disposed longitudinally extending bed rails 8, 9, having integrally formed lower horizontal flanges 10, 11, respectively. The horizontal flanges 10, 11, terminate in inwardly presented longitudinal margins substantially coincident with the opposite margins of downwardly cut-out clearance recesses 12 formed in the members 3', 4', 5', 6', and 7'. On their upper faces adjacent their inner horizontal margins the flanges 10, 11, are machined to receive upwardly and inwardly projecting slide rails 13, 14, the upwardly and inwardly presented faces of which are respectively at right angles to each other and ground to a high degree of smoothness for operative engagement respectively with sets of vertical rollers 15 and horizontal rollers 16 conventionally bearinged in the oppositely presented side faces and under face, respectively, of an elongated rectilinear reciprocating press-bed 17 having a horizontal top wall 18 provided upon its upwardly presented face with three uniformly spaced slightly raised pad sections 19. Each of the pad sections is provided at its opposite ends with transversely extending rectilinear slots 20 and 21 for receiving upstanding cross bars 22, 23, held tightly and securely therein by means of bolts 24, all as best seen in Figures 11 and 12 and for purposes presently more fully appearing.

The bed rails 8, 9, are provided at uniformly spaced intervals with three substantially identical offset printing heads 25, each of which is conventionally provided with a plurality of inking rollers for feeding ink downwardly from a conventional ink well 26 to a main printing roller or drum 27, provided with an offset printing blanket *b*. Each roller 27 is keyed upon a main shaft 28 having a bevel gear 29 meshing with a bevel gear 30 pinned upon a horizontal cross shaft 31 operatively mounted in a journal 32. It will be noted that the shaft 31 extends horizontally along the side of all three printing heads or stands 25 so that all are geared together and travel in time. The shaft 31 is further provided with a bevel gear 33 which meshes with a similar bevel gear 34 mounted upon the upper end of a vertical shaft 35 which is, in turn, operatively mounted in bearings 36, 37, respectively, forming component parts of gear housings 38, 39. In its lower ends the shaft 35 is provided with another bevel gear 40 which meshes with a bevel gear 41 pinned upon a horizontal drive shaft 42 which is, in turn, operatively mounted at its opposite ends in bearings 43, 44, respectively, mounted upon the leg frames 4, 5. At its rearwardly projecting ends (reference being had to the left hand side of Figure 1) the shaft 42 is provided with a large pulley 45 which is connected by a plurality of V-belts 46 to a driving pulley 47 pinned to the outer end of a drive shaft 48 conventionally forming a part of a motor 49 which is bolted upon a laterally extending auxiliary base frame 50.

Pinned or otherwise rigidly mounted upon the shaft 42 just rearwardly of the bearing 44 is a spur gear 51 which meshes with an intermediate spur gear 52 rigidly mounted upon the outer end of a jack shaft 53 journaled in a bearing 54 bolted upon the side face of the leg frame 5. Also pinned or otherwise rigidly mounted upon the jack shaft 53 intermediate the gear 52 and the bearing 54 is a transmission gear 55 which meshes with a relatively large spur gear 56 pinned, keyed, or otherwise rigidly secured upon the rearwardly projecting end of the shaft 57 operatively journaled in and extending horizontally between the bearings 58, 59, respectively, bolted upon horizontal cross struts 60, 61, forming integral parts of the leg frames 5, 6.

Keyed upon the shaft 57 and located between the leg frames 5, 6, is a large drum cam 62 provided upon its peripheral surface with a single-thread continuous cam tooth 63 adapted to project between and bear on its side faces against a pair of cam following rollers 64, 65, which are conventionally bearinged upon the under side of the press-bed 17. The cam tooth 63 is of such shape and contour that it will cause the press-bed 17 to reciprocate forwardly and backwardly through a complete stroke for each complete revolution of the drum cam 62 following the speed motion acceleration graph or diagram shown in Figure 15. It is important to note in this connection that at one portion of the forward stroke representing approximately 120° of movement of the drum cam 62 the press-bed 17 is moving forwardly at precisely uniform and constant speed and it is in this portion of the cycle that the printing impression is made, as will be presently more fully pointed out.

Mounted along one side face of the press-bed 17 in endwise abutment between each of the pairs of bars 22, 23, is a short section of rack-bar 66 reinforced by a rod

67 which extends at its ends through the bars 22, 23, and is threaded for receiving nuts 67'. The ends of the rack-bars 66 are provided at their opposite ends and adjacent their under faces with longitudinally extending ears 68 apertured for vertical sliding movement on pins 69 mounted in and depending from the laterally projecting ends of the bars 22, 23, said rack-bars 66 being biased upwardly by strong heavy compression springs 69'. Each rack-bar 66 is provided with upwardly presented teeth which project substantially above the plane of the upper faces of the bars 22, 23, for meshing engagement with a gear segment 70 rigidly mounted on and carried by the printing drum 27. The segment 70 is of slightly greater arcuate length than the impression section of the roller 27 and is so placed as to be aligned therewith. Thus, during operation of the press A, each time the impression section of the printing roller 27 comes around into superimposition over the area lying between the bars 22, 23, the gear segment 70 will begin to mesh with the rack bar 66 so that the printing roller 27 and press-bed 17 are locked into precise alignment or registration, so to speak, while the impression is being made. If, for any accidental reason, one or more of the segments 70 should get badly out of time and not mesh with the corresponding rack-bars 66 the latter can yield sufficiently to prevent permanent damage while creating a loud clatter warning the operator to shut down the press for suitable repair or realignment.

Provided for slip-fitted or removable disposition between each pair of bars 22, 23, is a flat metal platen 71 provided centrally of its under face with an aperture for engagement upon a retainer pin 72 rigidly mounted in and projecting upwardly from the press-bed 17. The platen 71 is further provided with a precisely machined upper or impressioned face 73 and provided at one end with a removable paper attachment bar 74 held in place thereon by means of screws 75. At the opposite end the platen 71 is provided upon its side faces with two rearwardly projecting arms 76 held in place by screws 77 and extending outwardly beyond the transverse margin 78 for rotatably mounting a transverse roller 79 having an axially extending or elongated diametral slot 80 through which a tongue-like section of paper may be inserted. The roller 79 projects at its ends a short distance outwardly from the arms 76 and is provided with nicks 81 into which a screw driver or other conventional tool may be inserted for purpose of proper manipulation. Finally, the arms 76 are provided with small set screws 82 which bear against the roller 79 to hold it more or less securely against free turning. By proper adjustment of the set screws the right amount of frictional pressure may be applied to the roller 79 so that it will turn only with difficulty. It will, of course, be understood that the amount of pressure may be varied to suit the operator. The bar 74 may be loosened or removed and a section of heavy paper *p* of a width substantially equal to the width of the platen 71 may be inserted therein and clamped in place. Thereupon, a series of thin pieces of paper *t* may be placed on the upper face 73 of the platen and the section of kraft paper *p* pulled tightly thereover with its opposite or free ends tucked into the slot 80. Thereupon, the roller 79 may be rotated by a screw driver or other tool inserted in the nick 81 winding the section of kraft paper *p* on the roller 79 and drawing it tightly down against the inserted sections of thin paper *t* holding them securely in place. These sections of paper form an impression pad upon the platen 71 and the thickness of this pad may be appropriately adjusted by inserting a suitable number of thicknesses of paper underneath the tightly drawn top of kraft paper *p* and thereby building up the height of the impression pad so that the desired amount of impression-forming pressure will be created between the printing roller 27 and the platen 71, taking into consideration, of course, the thickness of the paper web *w* which is being imprinted as it passes through the press.

Rotatably mounted upon and extending upwardly from the top portion 18 of the press-bed 17, intermediate of the printing heads or stands 25, is a transversely aligned upstanding roller 83 having peripheral notches 84 and being disposed axially in horizontal alignment so as to engage and support the marginal edges of a paper web *w*. The notches 84 are so spaced from each other as to engage the edges of the paper web *w* lightly but firmly and thus center the paper web as it travels across the platens 71. Also provided for centering and stabilizing the paper web is a retainer bar 85 rigidly mounted in a suitable slot 86 formed in the upper face of the press-bed 17 and having short inwardly projecting flanges 87 spaced upwardly from the upper face of the bar 85 to provide very thin inwardly presented slots 88 adapted for loosely and slidably engaging the margin of the paper web *w*.

At its opposite or rearward end the press-bed 17 is provided upon its side faces with a pair of transversely aligned upwardly projecting ears 89 for rotatably supporting a short transverse shaft 90 which projects therethrough and its outer end is provided with short forwardly extending arms 91 which are biased downwardly by tension springs 92 hooked at their upper ends through the arms 91 and at their lower ends suitably fastened to the side faces of the press-bed 17. Intermediate the ears 89, the shaft 90 is provided with a pair of forwardly projecting bracket arms 93 which are cross connected by a reinforcement rod 94 which is tightly fitted in and extends through a roller frame 95 also rigidly fastened to and extending forwardly from the shaft 90. At its outer or forward end the arm 95 is provided with a depending yoke 96 supporting a vertical roller 97 which bears firmly against the upper face of the paper web *w* to provide the appropriate amount of rearward drag or tension thereon. Also mounted upon the press-bed 17 intermediate the ears 89 is a plate 98 of substantially the same thickness as the platen plate 72 so that the paper web *w* will ride smoothly over the upper face thereof and will be supported from beneath against the roller 97. Along its lateral margins and adjacent its forward end the plate 97 is provided with an inwardly extending ear 99 which is undercut so that a substantial portion of its under face will be spaced upwardly from the upper face of the plate 98 and will act as a side or marginal guide for the paper web *w*.

Also at its rearward end the press-bed 17 is provided along its lateral or side faces with a pair of rearwardly projecting horizontally aligned bracket arms 100 for operatively supporting a pair of shafts 101, 102, journaled therein and extending horizontally therebetween. Rigidly mounted on the shafts 101, 102, are steel feed rollers 103, 104, respectively, through which the paper web *w* is fed. The shafts 101, 102, project beyond one of the arms 100 and are geared together by meshing spur gears 105, 106, and the shaft 101 further projects outwardly at its other end and is provided on such projecting end with a sprocket 107 connected by a chain 108 to a companion sprocket 109 pinned to the shaft 28 of the rearwardmost printing head or stand 25. It should be pointed out in this connection that the shafts 101, 102, are geared together and are counter-rotating so as to continuously feed the paper web *w* upwardly from a stock-roll (not shown). The paper web *w* is so placed or fed into the machine initially that it will extend upwardly in a free loop at the in-feed end of the press A to allow a sufficient amount of free length sufficient to compensate for the reciprocation of the press-bed 17, as will be presently more fully pointed out.

Slidably mounted in and extending horizontally through the forward transverse end wall 110 of the press-bed 17 are three elongated rods 111 which are threaded at their rearward ends and provided with nuts 112 and washers 113 for abutting engagement against the rearward presented ends of spiral springs 114 which are, in turn, disposed in abutting engagement at their forward ends against the rearward or inwardly presented face of the pressbed end wall 110. At their forwardly projecting end the rods 111 are rigidly and securely mounted in the transverse end wall 115 of an adjustable feed drum carriage 116 which is thus shiftably supported upon and in forwardly disposed relation to the press-bed 17.

Adjacent its forward end the rail 8 is provided with a sleeve bearing 117 for rotatably supporting a short idler shaft 118 which projects therethrough and is rigidly provided at its opposite ends with sprockets 119, 120, the sprocket 119 being connected by a chain 121 to a companion sprocket 122 pinned or keyed upon the forwardly projecting end of the shaft 31. The sprocket 120 is similarly connected by means of a sprocket chain 123 to a companion sprocket 124 pinned upon the rearwardly presented end of a quill 125 journaled in a sleeve

bearing 126 also rigidly mounted upon the member 8. The quill or sleeve is held within the sleeve bearing 126 by means of conventional ball bearing assemblies 127 which are, in turn, mounted in circular end plates 128 threaded into the sleeve bearing 126 and held in place by means of set screws 129. The quill 125 is externally threaded on its projecting end and is provided with retaining collars 130 which hold the inner race elements 131 of the roller bearing assemblies against end shoulders 132.

Formed integrally with the quill 125 and located within the sleeve bearing 126 are four pairs of spaced parallel ears 133, 133', 134, 134', for supporting short shafts 135, 135', 136, 136', respectively. Rotatably mounted on the shafts 135, 135', are rollers 137, 137', and similarly mounted on each of the shafts 136, 136', are spaced parallel pairs of rollers 138, 138', 139, 139'.

Operatively mounted for longitudinally slidable movement between the rollers 137, 137', 138, 138', 139, 139', and also for rotatable movement therewith is a horizontal spline shaft 140 which has a length substantially greater than the overall length of reciprocation of the press-bed 17 so that the spline shaft 140 will be held within the quill 125 at all times and while sliding to-and-fro with the reciprocating press-bed will rotate with the quill 125 as the latter is driven by the sprocket 124 and chain 123. At its forward end the spline shaft 140 is rotatably mounted within bearings 141, 142, which are, in turn, rigidly bolted upon the side face of the feed drum carriage 116 adjacent the forward end thereof, and pinned or keyed to the shaft 140 intermediate the bearings 141, 142, is a worm-cam 143 provided upon its peripheral face with a radially projecting double-thread 144 having lead-in portions 145, 145', at its opposite ends and being provided therebetween with a straight or land section 146. The lead-in sections 145, 145', are spaced for operatively accommodating or engaging cam-following rollers 147, operatively journaled upon a uniformly spaced series of radial pins 148 rigidly mounted in and projecting from the peripheral face of a cam-following drum 149 which is, in turn, pinned or keyed upon the laterally projecting end of a shaft 150 journaled in the end and extending horizontally between side flanges 151, 151', integrally forming a part of the forward end of the feed-drum carriage 116. The top member 152 of the feed-drum carriage is cut away adjacent the forward end to provide a slot 153 through which the upper arcuate portion of a feed-drum 154 extends, the feed-drum 154 being suitably bolted to a flange collar 155 which is, in turn, keyed upon the shaft 150. Threaded at uniformly spaced intervals into the face of the feed-drum 154 are a plurality of plugs 156 having relatively fine-gauge radially projecting pins 157, as best seen in Figure 6 and for purposes presently more fully appearing.

Similarly bolted upon the upper face of the other rail 9 is a sleeve bearing 158 in which is mounted a short shaft 159 provided on its outer end with a hand-wheel 160 and on its inner end with a bevel gear 161 meshing with a companion bevel gear 162 pinned to or otherwise rigidly mounted upon a quill 163 journaled in and extending horizontally through a sleeve bearing 164 also bolted upon the upper face of the rail 9 in forwardly spaced relation to the sleeve bearing 158. The quill 163 and sleeve bearing 164 are substantially identical in internal construction to the previously described quill 125 and sleeve bearing 126 for slidably and rotatably accommodating a spline shaft 165 which is free at its forward end and at its rearward end is journaled in a sleeve bearing 166 bolted upon the side face of the side flange 151' and is, at its rearwardly extending ends, provided with a spur gear 167 which meshes with a spur gear 168 pinned to an idler shaft 169 which is also provided with an intermediate spur gear 170 meshing, in turn, with a second intermediate spur gear 171 which is similarly mounted upon a second intermediate shaft 172 for meshing engagement with a somewhat larger spur gear 173 formed integrally with and extending around the outer periphery of an adjustment collar 174 rotatably mounted upon the center rod 111 and against the rearwardly presented transverse end face 115 of the feed-drum carriage 116, and having an angularly inclined peripheral rim or cam face 175 which bears against an oppositely inclined peripheral cam face 176 formed upon a stationary collar 177 which is, in turn, rigidly mounted upon the forwardly presented transverse face of the end wall 110 of the press-bed 17.

It will be seen that as the press-bed 17 reciprocates to-and-fro the spline shaft 165 will slide longitudinally through the quill 163 and, at the same time, is capable of rotation by means of appropriate manipulation of the hand-wheel 160. This rotational movement is transmitted through the train of gears 167, 168, 170, and 171 to the gear 173 which produces a small amount of rotation of the collar 174 which bears on its inclined face 175 against the inclined face 176 of the stationary collar 177, thus, correspondingly increasing or decreasing the longitudinal distance between the feed-drum carriage 116 and the end wall 110 of the press-bed 17. It will, of course, be understood that the springs 114, acting through the rods 111, will serve to hold the collars 174 and 177 in tight engagement at all times. This longitudinal adjustment of the feed-drum carriage 116 makes it possible to shift the impression upon the paper web *w* forwardly or rearwardly within reasonable limits as may be required, so that in the event that any mis-impression or faulty registration occurs during operation due to any one of a number of unpredictable factors, an appropriate adjustment can be conveniently accomplished while the press A is still in full speed operation and without necessitating any shut-down.

It should be noted that the worm-cam 143 is so fixed on the shaft 140 so as to be timed with the peripheral cam-tooth 63 on the drum-cam 62. Thus, as will be seen by reference to Figure 16, the particular roller 147, which is engaged by the thread tooth 144 of the cam 143, will be stationary or, in other words, will be held against straight land portions while the press-bed 17 is moving forwardly or during the impression part of the stroke and will correspondingly commence rotation as the press-bed 17 begins to move rearwardly. Thus, the paper web *w* will be fed forwardly relative to the press-bed 17 as the press-bed is moving rearwardly and will, in turn, be stationary relative to the press-bed 17 while the press-bed is moving forwardly. In other words, the paper web *w* will be fed forwardly into position for the next impression as the press-bed 17 is in its return stroke.

Bolted upon the upper face of the feed drum carriage 116 adjacent the rearward end thereof is a punching die 178 having a longitudinally extending slot 179 for slidably embracing one side margin of the paper web *w*. Rigidly mounted in and extending upwardly from the die 178 are a pair of vertically upstanding slide pins 180 for shiftably supporting a punching head 181 which is biased upwardly by a compression spring 182 and is provided adjacent its forward and rearward margins with a removably mounted pair of pin-like punches 183 projecting downwardly through suitably formed clearance apertures 184, 185, located in the die 178 above and below the slot 179. Upon its upper face the punching head 181 slidably bears against an actuating roller 186 journaled in the end of a rocker arm 187, which extends transversely across the feed-drum carriage 116 and is pivoted between ears 188, formed integrally with an upstanding bracket 189 bolted upon the upper face of the feed-drum carriage 116. At its other or free end the rocker arm 187 projects outwardly above the shaft 140 and is provided with a cam-following roller 190 which bears upon the peripheral face of an actuating cam 191 pinned or otherwise rigidly mounted upon the shaft 140. Thus, as the shaft 140 rotates the arm 187 will be rocked upwardly and downwardly to impart intermittent downward movement to the punching head 181 and the punches 183, thereby punching a pair of longitudinally spaced holes in the edge of the paper web *w* at predetermined intervals. The cam 191 is timed in proper relation to the worm-cam 143 and drum-cam 62, so that the punching operation will take place while the paper web *w* is stationary relative to the press-bed 17. The spacing between the holes punched by the punches 183 is precisely equal to the peripheral distance between successive pins 157 so that the paper web *w* will be positively engaged thereby and precisely fed forwardly responsive to rotation of the drum 154. It will, of course, be apparent that the amount of stepwise rotary movement of the drum 154 will be equal to the distance between successive impressions so that each time the press-bed 17 moves backwardly upon its return stroke the paper web *w* will be fed forwardly with respect thereto by a distance equal to the distance between impressions.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the multicolor offset printing press may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A printing press comprising a horizontal frame, an elongated press-bed mounted in the frame for horizontally reciprocating movement, printing means operatively mounted on the frame in superposed relation to the press-bed, means for holding a continuous web of paper-stock upon the upper face of the press-bed, means carried by the press bed and movable therewith for intermittently perforating the paper-stock adjacent one longitudinal margin thereof in timed relation to the reciprocation of the press-bed, a roller operatively mounted on and carried by the press-bed having a plurality of radially projecting spaced pins positioned for engagement in the perforations formed in the paper-stock by the punching means, and means for rotating the roller in timed relation to the reciprocating movement of the press-bed.

2. A printing press comprising a horizontal frame, an elongated press-bed mounted in the frame for horizontally reciprocating movement, printing means operatively mounted on the frame in superposed relation to the press-bed, means for holding a continuous web of paper-stock upon the upper face of the press-bed, means carried by the press-bed and movable therewith for intermittently perforating the paper-stock adjacent one longitudinal margin thereof in timed relation to the reciprocation of the press-bed, a roller operatively mounted on and carried by the press-bed having a plurality of radially projecting spaced pins positioned for engagement in the perforations formed in the paper-stock by the punching means, and means for rotating the roller in timed relation to the reciprocating movement of the press-bed, said roller being adjustable toward and away from the press-bed in a line longitudinal with respect to the longitudinal axis of the press-bed.

3. A printing press comprising a horizontal frame, an elongated press-bed mounted in the frame for horizontally reciprocating movement, means for reciprocating the press-bed, printing means operatively mounted on the frame in superposed relation to the press-bed, means for driving the printing means in timed relation to the movement of the press-bed, a feed-roller carriage slidably mounted on one end of and carried by the press-bed and being longitudinally shiftable in relation thereto, manually operable means mounted on the frame for shifting the feed-roller carriage to any position in relation to the press-bed within predetermined limits of adjustment, a quill operatively carried by and connected to said last named means, a spline shaft mounted on and extending lengthwise along the feed-roller carriage in parallel relation to the path of movement of the press-bed, said spline shaft being journaled for rotation around its longitudinal axis and extending through the quill so that it will move to-and-fro through the quill as the press-bed reciprocates, means carried by the quill and being slidably engaged with the spline shaft for transmitting rotary movement from the quill to the spline shaft, and means on the feed-roller carriage responsive to rotation of the spline shaft for shifting the feed-roller carriage longitudinally with respect to the press-bed.

4. A printing press comprising a horizontal frame, an elongated press-bed mounted in the frame for horizontally reciprocating movement, means for reciprocating the press-bed, printing means operatively mounted on the frame in superposed relation to the press-bed, means for driving the printing means in timed relation to the movement of the press-bed, a feed-roller carriage mounted on one end of the press-bed and being longitudinally shiftable in relation thereto, manually operable means mounted on the frame for shifting the feed-roller carriage to any position in relation to the press-bed within predetermined limits of adjustment, a quill operatively carried by and connected to said last named means, a spline shaft mounted on and extending lengthwise along the feed-roller carriage in parallel relation to the path of movement of the press-bed, said spline shaft being journaled for rotation around its longitudinal axis and extending through the quill so that it will move to-and-fro through the quill as the press-bed reciprocates, means carried by the collar and being slidably engaged with the spline shaft for transmitting rotary movement from the collar to the spline shaft, means on the feed-roller carriage responsive to rotation of the spline shaft for shifting the feed-roller carriage with respect to the pressbed, a feed-roller carried by the feed-roller carriage, means on the press-bed for supporting an elongated web of paper-stock upon the press-bed, said paper-stock being adapted to extend around the feed-roller means on the feed-roller for engaging the web of paper-stock, a roller-toothed sprocket operatively mounted on the feed-roller, a worm-toothed cam rotatably mounted on the feed-roller carriage and engaged in the roller sprocket for intermittently advancing the feed-roller, a rotary collar operatively mounted on the feed-roller carriage and drivingly connected to the worm-toothed cam, a second spline shaft mounted on and extended lengthwise along the frame in parallel relation to the path of movement of the press-bed, said second spline shaft extending through said last named collar so that such collar will move to-and-fro along said second spline shaft as the press-bed reciprocates, means carried by said collar and slidably engaging said second spline shaft for transmitting rotary movement from the second spline shaft to said last named collar, and means mounted on the frame for rotating said second spline shaft in timed relation to reciprocatory movement of the press-bed.

5. In a device of the character described a motion transmitting element adapted for transmitting rotary movement from non-reciprocating power source to a reciprocating member having a supported element which is adapted to be rotarily driven by such rotary movement, said means comprising a spline having a cross-sectional shape resembling a four-armed equilateral cross, in which each arm has oppositely presented longitudinally extending flat faces, a quill disposed concentrically around the spline, and having opposed pairs of rollers rotatably mounted therein, said rollers being adapted to bear against the four flat faces of two longitudinally aligned arms, and two additional rollers located on opposite sides of the quill intermediate the pairs of rollers and adapted to bear rotatably against the end faces of two longitudinally aligned arms.

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