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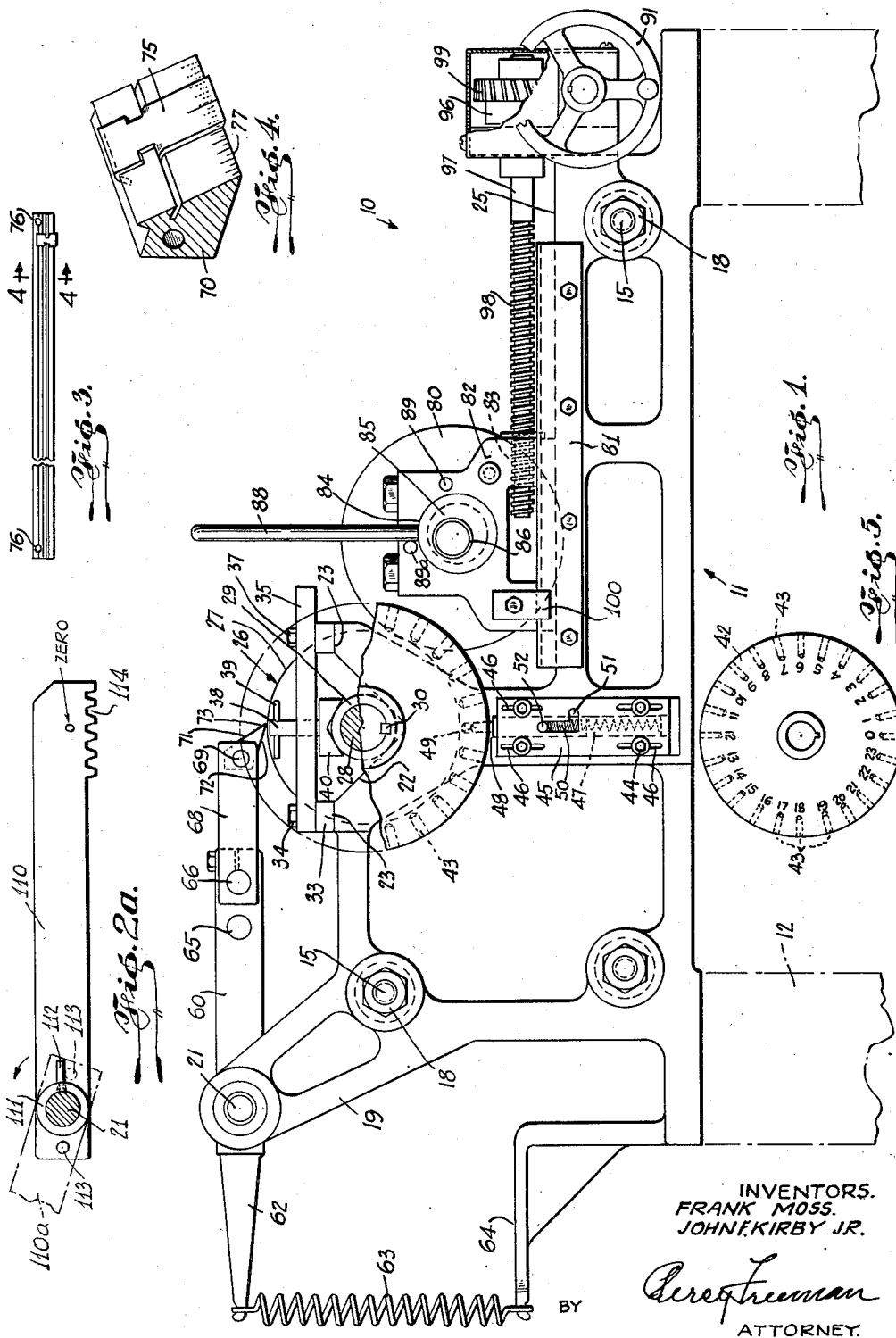
F. MOSS ET AL

2,539,965

PRINTING PLATE MOUNTING AND PROOFING PRESS

Filed Dec. 31, 1947

3 Sheets--Sheet 1



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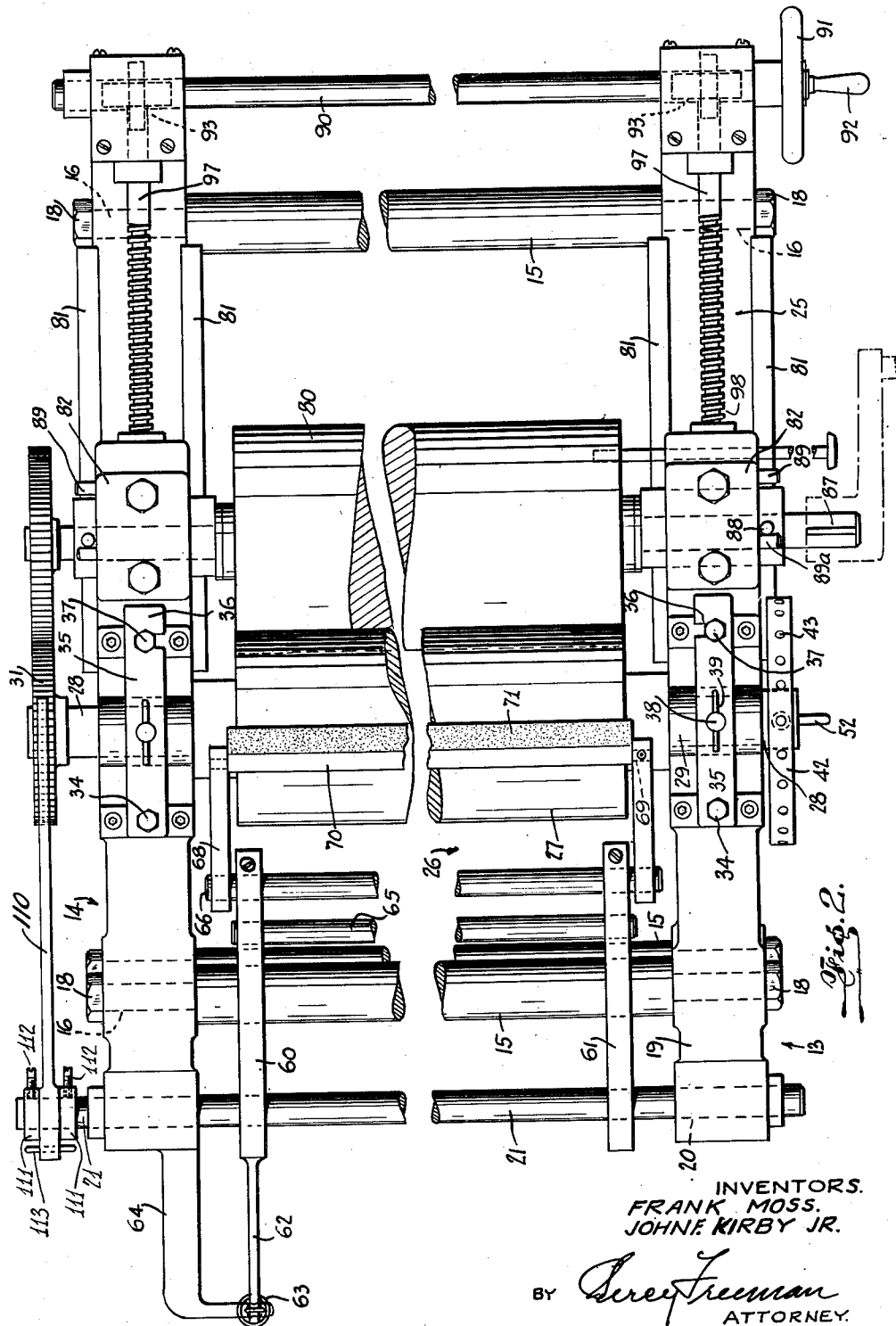
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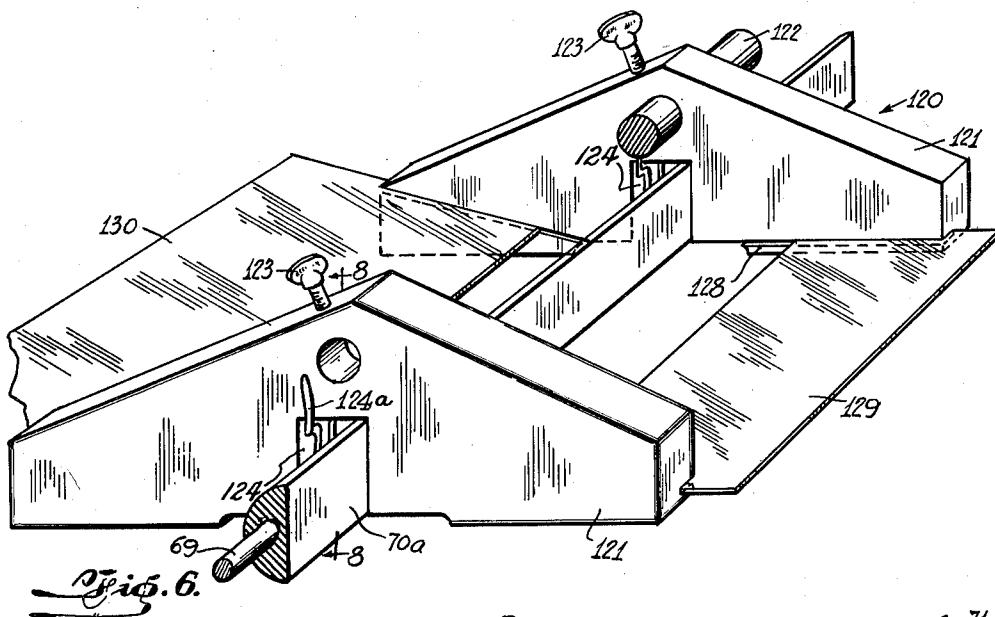
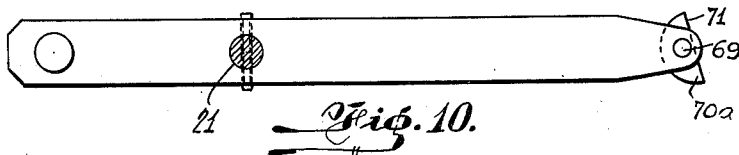
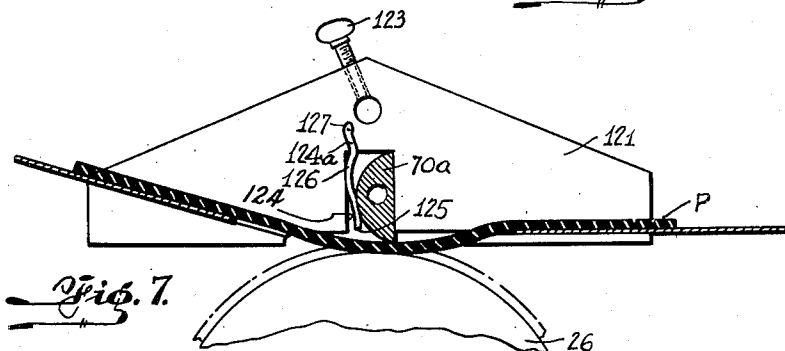
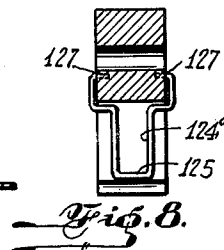
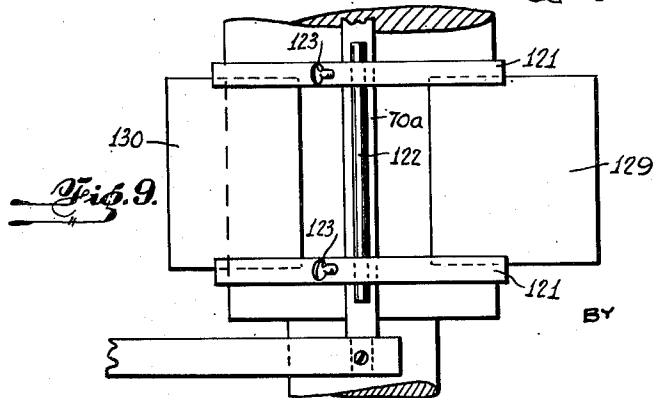
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PRINTING PLATE MOUNTING AND PROOFING PRESS

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3 Sheets-Sheet 3



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PRINTING PLATE MOUNTING AND
PROOFING PRESSFranklin Moss, Hollis, and John F. Kirby, Jr.,
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1 Claim. (Cl. 101—216)

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This invention relates to proof-printing machines. It is particularly directed to a machine and method for mounting a multiplicity of printing plates in exact color register on any number of plate cylinders and then proofing to check color register. The purpose of the machine and method are to facilitate the securing of printing plates on cylinders ready for printing so that the cylinders, with plates attached, may be quickly put into the printing press itself and the run started with a minimum of delay.

An object of this invention is to provide a plate mounting and proof-printing machine which shall be inexpensive to manufacture and which will save much valuable time on the larger printing presses. In addition, it would permit a much higher quality of work to be done by simplifying accurate mounting of the printing plates on the plate cylinders, and by permitting pre-proofing the composed plate cylinders for quality and color register.

Another object of this invention is to provide a machine of the character described so constructed that it will handle any diameter plate cylinder within the limits of the machine, and which is provided with a dividing head for circumferential spacing.

Another object of this invention is to provide in a machine of the character described a straight edge for aligning the printing plates and which may be graduated for longitudinal spacing.

Another object of this invention is to provide in a machine of the character described, transparent adjustable indicators slidable along the length of a straight edge which is movable against the plate cylinder, the indicators being provided with sharply ruled hair lines to permit the exact locating of the printing plates on the plate cylinders so that color registration is assured.

Another object of this invention is to provide in a machine of the character described, an impression cylinder provided with an eccentric throw-off to permit quick changing of plate cylinders without disturbing impression setting or proofs of previous colors.

Yet a further object of this invention is to provide a machine of the character described so constructed that the proofs can be made directly on metal, or on paper wrapped on the impression cylinder, or on a rubber-covered impression cylinder for transferrable proofs. With the improved machine, progressive, multicolor proofs can be made on one paper which remains securely fastened to the impression cylinder during

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proofing to avoid possibility of error due to slippage of paper.

Yet a further object of this invention is to provide a machine on which either flexible or rigid curved plates may be mounted and color-proofed, said machine being adapted for proofing a single or multiple quantity of flexible or rigid curved plates.

Yet a further object of this invention is to provide in a machine of the character described, means for adjusting the impression cylinder; the plate cylinder and impression cylinder furthermore being engaged by gears for exact control of surface speeds.

Yet another object of this invention is to provide a machine of the character described combining mounting and proofing facilities cylindrically.

A still further object of this invention is to provide a strong, durable and rugged machine of the character described which shall be relatively inexpensive to manufacture, easy to manipulate, and adjust, smooth and positive in operation, and yet practical and efficient to a high degree in use.

A further object is to provide a method for mounting multi-color printing plates upon plate cylinders in such manner that the obtaining of perfect color registration may be facilitated.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claim.

In the accompanying drawings, in which are shown various possible illustrative embodiments of this invention:

Fig. 1 is a side elevational view of a press-proofing machine with parts broken away and in cross-section.

Fig. 2 is a top plan view of a machine embodying the invention.

Fig. 2a is a side elevational view of a detail of a locking arm.

Fig. 3 is an elevational view of a modification of the guide bar of Figs. 1 and 2.

Fig. 4 is a perspective view partly in section, showing a modified form of adjustable indicator and taken on line 4—4 of Fig. 3.

Fig. 5 is a side elevational view of the annular dividing head shown in Fig. 1, but drawn to a reduced scale.

Fig. 6 is a perspective view of a modified form of temporary plate support.

Fig. 7 is a sectional view of the plate support shown in Fig. 6 and showing a rubber plate in section and its relation to the plate cylinder.

Fig. 8 is a sectional view taken on line 8—8 of Fig. 6.

Fig. 9 is a top plan view of the plate support shown in Fig. 6, but drawn to a reduced scale.

Fig. 10 is an elevational view, shown partly in section, of a modified form of the guide arm.

Referring now in detail to the drawing, 10 designates a press-proofing machine of the character described. The same comprises a frame 11 mounted on any suitable supports 12. The frame 11 comprises a pair of parallel, substantially similar vertical frame members 13 and 14 interconnected by parallel horizontal transverse tie rods 15. The rods 15 may be formed with reduced end portions 16 passing through suitable openings in the frame members. Screwed to the outer ends of the reduced portions 16 are nuts 18 for fixing the frames to the tie rods. Each frame member is provided with an upwardly and rearwardly extending arm 19. The arms 19 are formed with aligned openings 20. Supported on the arms 19 and journaled in the openings 20 is a transverse rod 21 for the purpose hereinafter appearing.

Said frame members are furthermore formed with aligned V-shaped notches 22 opening upwardly. At the upper ends of the notches 22 are spaced horizontal shoulders 23 for the purpose hereinafter appearing. Each of said frame members is furthermore formed with a horizontal wall 25. It will be noted that the V-shaped notches 22 are disposed between the horizontal walls 25 and the arms 19, and are at a higher level than the walls 25 but below the shaft 21.

Mountable on the frame is a conventional plate cylinder 26 which comprises a cylindrical portion 27 provided with trunnions 28. For convenience in mounting plate rollers 26 in the device and for the protection of said trunnions, there are provided trunnion sleeves 29 within which the trunnions are freely rotatable. When the cylinder 27 is disposed between the frame members 13, 14, the sleeved trunnions rest in the V-shaped notches 22. On one of the trunnions may be secured a gear 31. The plate cylinder which is normally used in a printing press, may be taken out of the printing press and placed on the machine 10 so that printing plates may be mounted and made ready thereon and a proof may be made, and if the proof is satisfactory, the cylinder may then be taken off the machine 10 and put back into the printing press. This saves considerable time in the use of the printing press as well as time of the pressman. Plate cylinders may be thus prepared without tying up the press.

Means is provided for removably retaining the cylinder 26 on the machine 10. To this end there is mounted on the shoulders 23, spacing blocks 33. Screwed to spacing block 33 and the frame members are pivot pins 34. Pivoted to each pin 34 is a locking arm 35, each formed with a notch 36 to engage under the head of a headed pin 37 extending from the opposite side of the V-block. Screwed to each locking arm 35 in alignment with the axis of cylinder 26 is a screw 38 formed with a handle 39. At the lower end of each pin 38 and below the locking arm is an inverted V-shaped block 40 engageable with the top of sleeve 29. It will now be understood that upon turning

the pin 38 in one direction, block 40 may be made to bear down against the sleeves to secure them against rotation. Upon loosening or unscrewing the pins 38, the arms 35 may be swung out to release the cylinder and permit replacement of another plate cylinder.

Detachably secured to the outer end of one of the axles or trunnions 28, as by key 30, is an annular dividing head or disc 42 formed with a plurality of spaced radially extending sockets 43 disposed peripherally all around the disc. These sockets may be consecutively numbered or indexed from a zero or starting point, as best seen in Fig. 5. Screwed to a side wall of frame member 13 are pairs of upper and lower, headed screws 44. Attached to the side of said frame member 12, as by said screws 44, is a guide bracket 45 formed with longitudinal slots 46 through which the shanks of the screws extend. Bracket 45 is formed with a vertical chamber 47. Slidably mounted in said chamber is a plunger 48 formed with a pin 49 at its upper end adapted to be selectively received in the sockets 43. Interposed between the lower end of plunger 48 and the bottom of chamber 47 is a coil spring 50. Bracket 45 is formed with an L-shaped slot 51. Fixed to plunger 48 is a pin 52 passing through the slot 51. The plunger 48 may be held in retracted position by engaging pin 52, pulling the plunger down, and rotating the plunger to bring the pin 52 into the foot of slot 51. It will now be understood that the cylinder may be turned to any desired angle and the plunger will engage within one of the sockets 43 in the disc or dividing head 42, thereby accurately positioning the cylinder in desired angular position. The printing plates are mounted on the plate cylinder 26.

Means is provided for aligning the plates for accurate longitudinal spacing on the cylinder. To this end there is fixed to shaft 21, a pair of aligned arms 60 and 61. Arm 60 is formed with a rearward extension 62 interconnected by a coil tension spring 63 to a bracket 64 on the frame member 14. The spring 63 tends to rotate arms 60, 61, in a counterclockwise direction, looking at Fig. 1 of the drawing. Arms 60, 61, are interconnected by a cross rod 65. At the outer ends of arms 60, 61, is a transverse rod 66. Fixed to the ends of the rod 66 are a pair of parallel arms 68. Arms 68 are interconnected by a shaft 69 on which is supported a straight edge 70. Straight edge 70 has a through passage, through which the shaft 69 passes. Said straight edge has an upper, downwardly and forwardly inclined surface 71, and a downwardly and forwardly inclined under-surface 72 meeting therewith to form an edge 73. Edge 73 is parallel to the axis of the cylinder 26. Upon pushing down the straight edge, the edge 73 will contact the surface of cylindrical portion 27, to permit aligning of printing plates on said cylinder. If desired, there may be frictionally slidably engaged on the surface 71 of member 70, a number of transparent guides 75. Graduations or markings 77 may be applied on the surface of the member 70. Sharply ruled lines on the guides 75 will permit exact location of the printing plate on the plate cylinder so that color register is assured. If desired, the guides 75 may be eliminated, and markings may be made as by a pencil directly upon the ungraduated surface of the straight edge 71a (Fig. 2). Such markings may, of course, be readily erased so that new markings may be substituted, as desired.

It will be noted that cylinders of various di-

ameters may be mounted on the frame within limits. After the plates have been aligned, the spring 63 will swing the straight edge 70 upwardly so that it is out of the way.

Locking bar 110 is pivotally carried on shaft 21 (Fig. 2) between two spaced collars 111, which are secured to the shaft 21 by set screws 112. Through the pivoted end of bar 110, there extends a stop pin 113 which may abut against set screws 112 when the bar 110 is swung over to inoperative position, as shown in broken lines at 110a, in Fig. 2a. The free end of bar 110 is provided with a gear rack section 114 for meshing engagement with teeth of gear 31 for locking the gear against rotation when desired.

Means is provided to mount on the frame, an impression cylinder 80 to cooperate with the plate cylinder 27. To this end there is fixed to portions 25 of the frame members, parallel guide plates 81. Slidably mounted on said portions 25 of the frame members and engaging guide plates 81 are pillow blocks 82. Each pillow block is formed with a longitudinal horizontal screw-threaded opening 83 for the purpose hereinafter appearing. Each pillow block is formed with a circular bearing 84. The bearings 84 of the pillow blocks 82 are aligned with each other. Within each bearing opening 84 is a bearing 85 formed with an eccentric opening 86. Cylinder 80 is formed with axial projections or axles 87 passing through the eccentric opening 86. Each bearing 85 is provided with an upwardly extending handle 88. On said pillow blocks are spaced stop pins 89, 89a to limit the angular movement of the handle 88.

It will now be understood that upon rotating the handles 88, the cylinder 80 will be moved without moving the pillow blocks. This construction provides for a quick means of moving the cylinder 80 against the cylinder 27 or away from said cylinder without disturbing the impression adjustment.

Means is provided for moving the pillow blocks simultaneously on portions 25 of the frame members 13, 14, in order to accommodate different diameters of plate cylinders, and to this end there is rotatably mounted at the front ends of frame members 13, 14, a transverse shaft 90. At one end of shaft 90 is fixed a hand wheel 91 provided with a handle 92. Upon turning the hand wheel 91, the shaft 90 may be rotated. On said shaft are worms 93. On the frame portions 25 are bearings 96. Journalled on each bearing 96 is a shaft 97 disposed above frame portion 25. Each shaft 97 is formed with a screw-threaded portion 98 engaging the threads of one of the threaded openings 83. On each shaft 97 is a worm wheel 99 meshing with one of the worms 93. It will now be understood that upon rotating the wheel 91, in one direction, the pillow blocks 82 are moved to the right; and upon rotating said wheel in an opposite direction, the pillow blocks are moved to the left, as seen in Figs. 1 and 2. Thus the position of the impression cylinder may be adjusted accurately as desired.

After the proof has been made of the plates on said cylinder 26, the cylinder is removed from the machine and another plate cylinder is mounted to receive the plates for the next color. The corresponding plates are mounted upon this second cylinder in the same positions previously noted or indicated with respect to the first plate cylinder.

Attached to each pillow block is a plate 100

engaging the outside rail 81 to aid in guiding the pillow block.

The operation of the device will now be understood. A single plate or a multiplicity of printing plates for the first color may be mounted on the plate cylinder 26 and their circumferential and longitudinal positions carefully noted or indicated. The paper to be imprinted is secured on the cylinder 80. The cylinders 26 and 80 may be rotated to make a proofing impression on the paper. The cylinder 80 may be made of metal or covered with rubber. The proofs can be made directly on the metal or rubber-covered impression cylinder for transfer proofs or on paper wrapped on said cylinder. The purpose of the machine is to get the plates on the cylinders ready for printing so that they may be quickly put into printing presses and the run started with a minimum of delay. Any necessary make-ready is taken care of at the same time.

Furthermore, a number of color cylinders may be impressed on a single sheet which remains on the cylinder 80 to give a multicolor proof-printing.

After an impression proof has been made of the first color, a transparent sheet may be wrapped around the proof paper and the second color impression may be made on the transparent sheet overlying the proof of the first color. Thus, should any adjustments be necessary, they may be made and a new transparent sheet wrapped around the proof of the first color to receive the next trial impression. When it is seen that the color plates properly register, the transparent sheet may be removed and an impression of the second color plate may be made directly upon the paper proof of the first color impression. In this way, the registration of the color plates may be compared without disturbing or mutilating the proof of the first color plates.

The straight edge provides for aligning and longitudinally spacing the plates on the cylinder 27. Much time and expense is saved by taking proofs as thus disclosed herein, before transferring the plate cylinder to the printing press. A much higher quality of work may be done by simplifying accurate mounting of the plates on the cylinder and permitting pre-proofing and make-ready of the composed plate cylinder for quality and color register. Plate cylinders of various diameters can be accommodated. The dividing head permits for circumferential spacing. The eccentric throw-off on the impression cylinder permits changing plate cylinders without disturbing the impression setting or proofs of previous colors. This machine permits the making of progressive, multicolor proofs on one sheet of paper which remains securely fastened to the impression cylinder 80 during proofing. Flexible or rigid curved plates may be mounted with make-ready and color proofed on cylinders 26. This machine, as will now be understood, is a proofing machine for proofing a single or multiple quantity of flexible or rigid curved plates. The impression cylinder is adjustable by operation of gears for exact control of surface speed.

The machine may be modified for mounting and proofing two colors at a time. Such modification would include two plate cylinders and a single or common impression cylinder for the two colors. In such case each plate cylinder will be adjusted to the impression cylinder. It is also possible to provide a feed roll of paper through the impression cylinder to a rewind in order for continuous proofing to be available.

To facilitate the application of rubber printing plates to the plate cylinder 23, the temporary plate holder 120, shown in Figs. 6 to 9, may be used. This device comprises two side walls 121, more or less triangularly shaped for convenience, though shape is unimportant, which are adjustably spaced on rod 122 each side wall having a lock screw 123 for securely fastening its respective side wall 121 in adjusted position on the rod 122. Both of the side walls 121 are recessed as at 124, to facilitate their attachment to straight edge 70a which has a semi-circular cross-section. In order to removably retain the temporary plate holder 120 on the straight edge, the side walls 121 are each provided with a spring 124a, shaped as shown in Figs. 7 and 8, and extending into recesses 124. The springs 124a are provided with a nose 125 and a hump 126, and the upper ends of the wire spring are secured in recesses 127 in the side walls. The confronting faces of the side walls 121 are provided with grooves 128, into which are removably slid metal or other rigid plates 129 and 130.

When it is desired to mount a rubber printing plate upon the plate cylinder 23, the straight edge 70a may be mounted on shaft 69, and the temporary plate holder 121 may be snapped onto the straight edge, as shown in Figs. 6 and 7. Plates 129 and 130 are made in different lengths to suit the different widths of rubber printing plates P.

When the side walls 121 have been satisfactorily adjusted to suit the particular printing plate, and plates 129 and 130 of the proper size are inserted in the grooves 128, the rubber printing plate may be threaded under the straight edge and have both parts of the printing plate lie upon the respective plates 129 and 130, which are inserted sufficiently into their respective grooves to prevent any sagging of the printing plate. Since the plate cylinder 26 may have adhesive applied to its surface, it is desirable to adjust the printing plate for proper location on the plate cylinder 26. The rubber printing plate may be squared up and positioned while being supported by the plates 129 and 130, and when properly positioned, the support plate 129 may be withdrawn slowly so that the rubber printing plate which had had substantially tangential contact with the plate cylinder may now be lowered gradually onto the cylinder, and secured thereto. The rear plate 130 may then be withdrawn so as to permit the other end of the rubber printing plate to contact the plate cylinder 26.

It will thus be seen that there is provided a device and method in which the several objects of this invention are achieved, and which are well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter

herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

A pre-proofing press comprising a frame having parallel, spaced frame members, means to interconnect the frame members, said frame members being formed with aligned V-shaped notches, a plate cylinder having axles rotatably received in sleeves or bushings resting in said notches, lock arms pivoted on said frame members and straddling said V-shaped notches, screw-threaded means on said lock arms having downwardly extending V blocks adapted to engage the axle sleeves to cooperate with the V-shaped notches to securely hold the axle sleeves, a straight edge pivotally supported above the plate cylinder and extending longitudinally parallel to the axis thereof, said straight edge being adapted to contact the plate cylinder, counterbalance means for rotating said straight edge in a direction away from the cylinder, a dividing head on said cylinder, sliding means on said frame to lockingly engage said dividing head in various angular positions thereof, a plate holder slidably adjustably mounted on said straight edge for preliminary holding of a plate preparatory to mounting on the plate cylinder, a pair of pillow blocks slidably mounted on said frame members, an impression cylinder rotatably mounted on said pillow blocks, and screw-threaded means for simultaneously moving said pillow blocks to move the impression cylinder toward and away from contact with said plate cylinder to adjust the degree of impression, and an eccentric throw-off means on each pillow block to support the impression cylinder, for moving the impression cylinder away from and towards said plate cylinder without disturbing the impression adjustment.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
626,031	Osborne	May 30, 1899
913,119	Ford	Feb. 23, 1909
1,264,882	Beach	May 7, 1918
1,270,331	Saliger	June 25, 1918
1,555,105	Dausmann	Sept. 29, 1925
1,833,897	Gabrielson	Dec. 1, 1931
2,231,187	Hawley	Feb. 11, 1941
2,405,795	Luehrs	Aug. 13, 1946
2,417,496	Huebner	Mar. 18, 1947