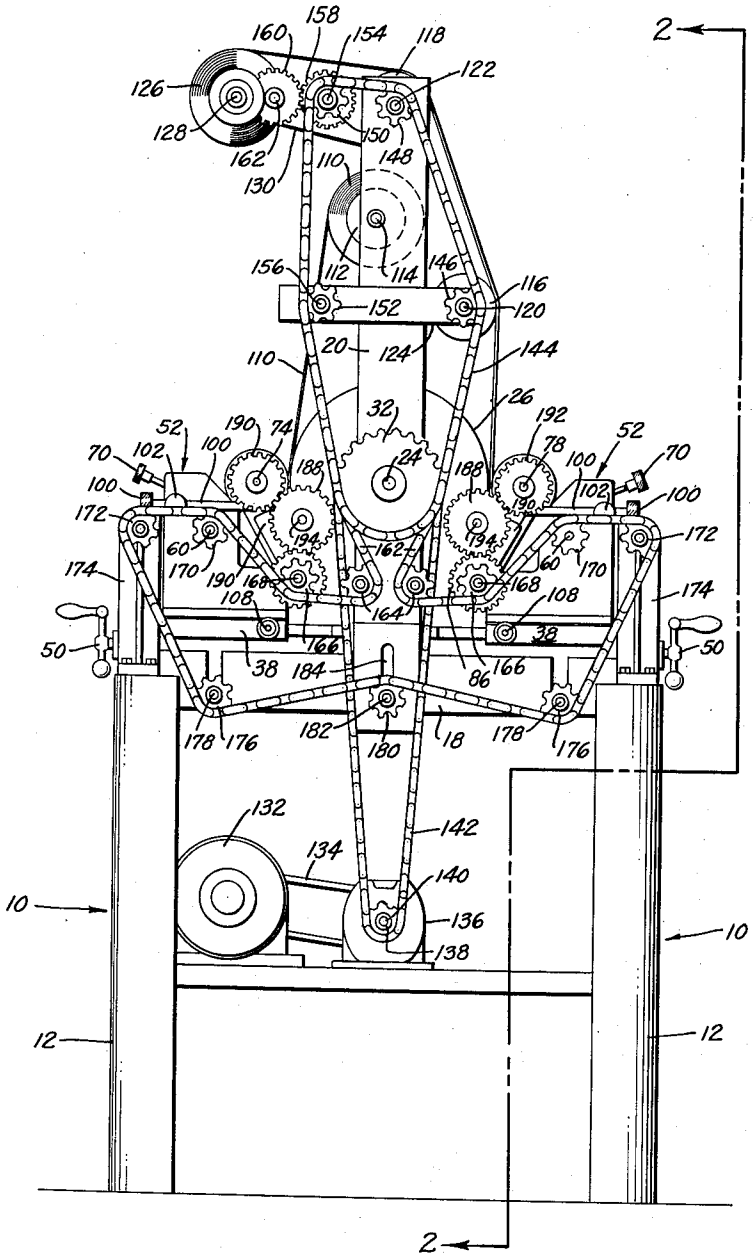
Feb. 9, 1954 G. G. THOMPSON 2,668,496

CYLINDER SUPPORT MEANS FOR ROTARY TAPE PRINTING PRESSES

Filed June 22, 1951 4 Sheets-Sheet 1



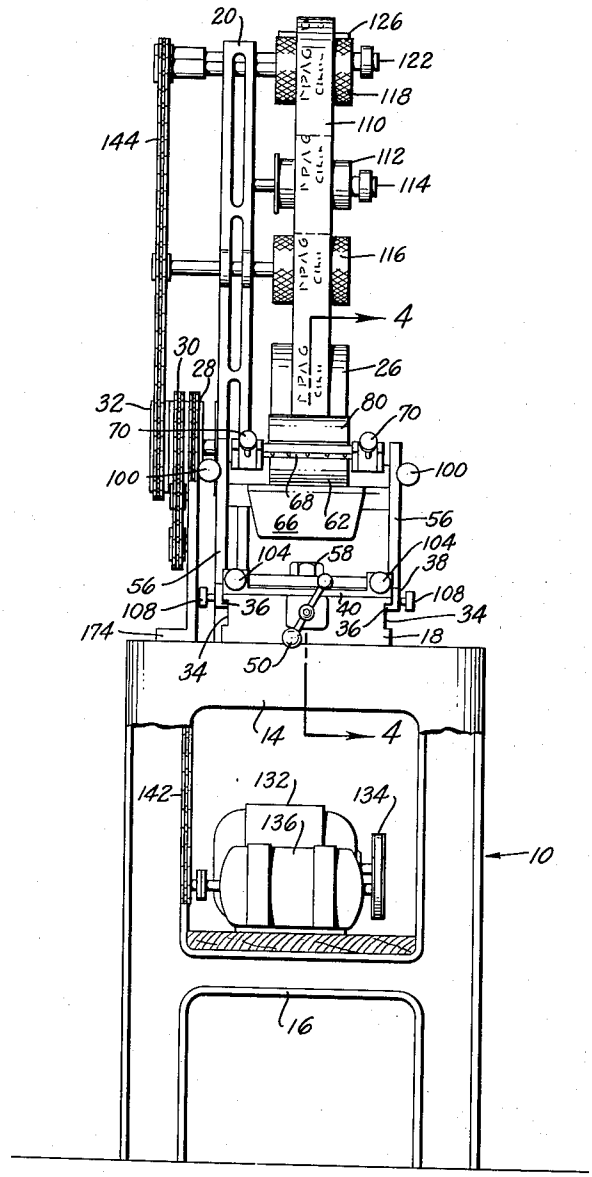
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CYLINDER SUPPORT MEANS FOR ROTARY TAPE PRINTING PRESSES

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FIG. 2



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CYLINDER SUPPORT MEANS FOR ROTARY TAPE PRINTING PRESSES

Filed June 22, 1951 4 Sheets-Sheet 3

FIG. 3

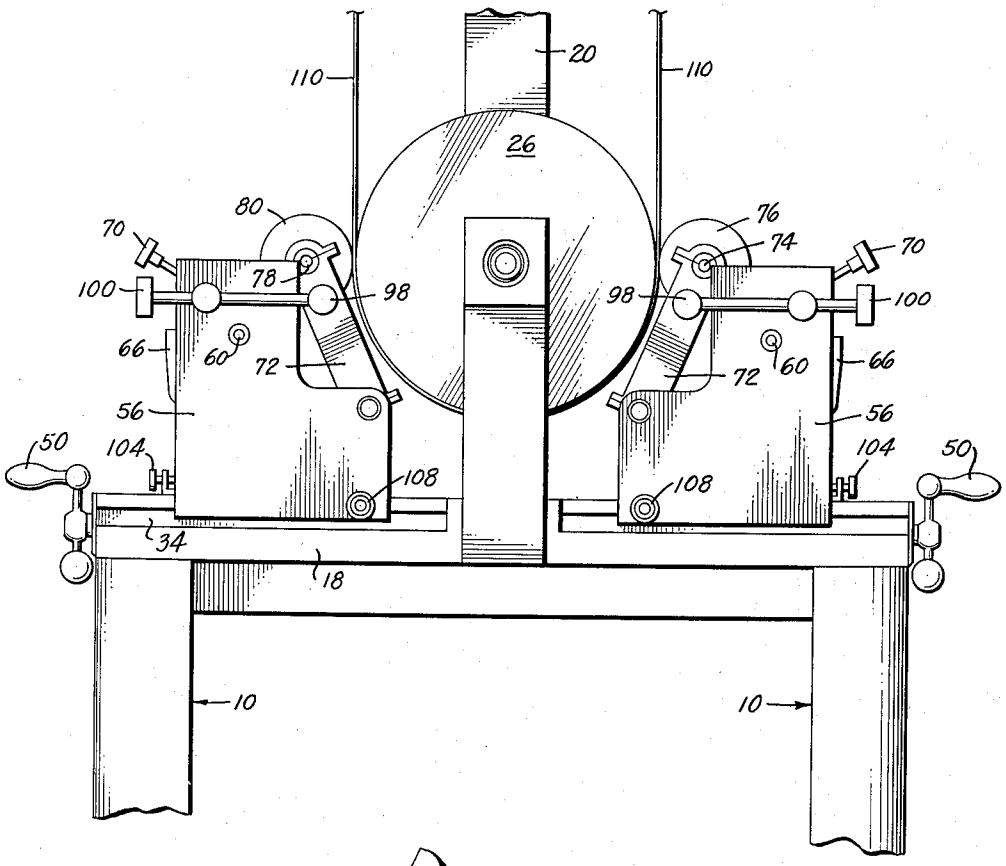
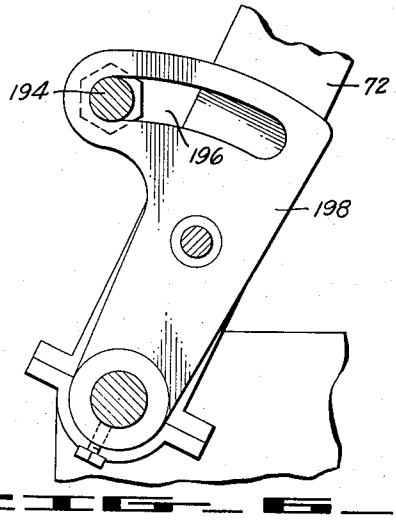


FIG. 6



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CYLINDER SUPPORT MEANS FOR ROTARY TAPE PRINTING PRESSES

Filed June 22, 1951 4 Sheets-Sheet 4

FIG. 4

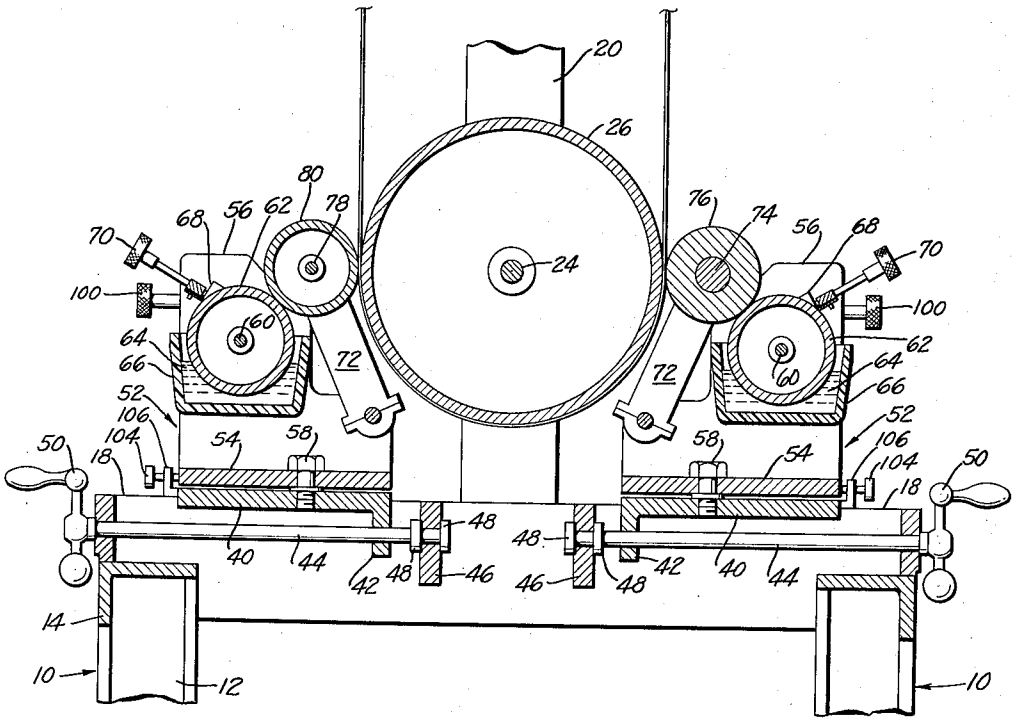
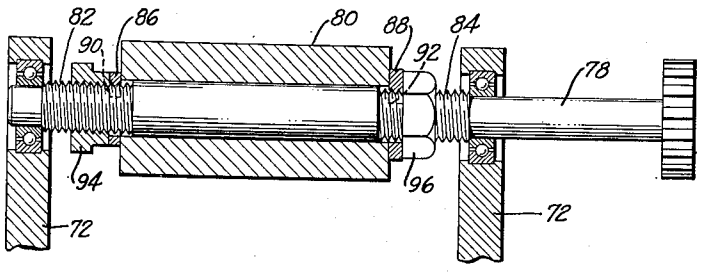


FIG. 5



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Patented Feb. 9, 1954

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UNITED STATES PATENT OFFICE

2,668,496

CYLINDER SUPPORT MEANS FOR ROTARY TAPE PRINTING PRESSES

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Application June 22, 1951, Serial No. 233,033

2 Claims. (Cl. 101—178)

1

This invention relates to printing apparatus, and more particularly to improvements in web type rotary printers of that class adapted to print multi-color impressions, with said improvements relating to means for mounting the inking and printing rolls with respect to each other and the platen, whereby relative adjustment of these elements may be simply and quickly made to obtain the proper contactual pressures therebetween and to obtain the proper correlation of the successive printings made on the web or tape by the plurality of printing rolls.

Among the objects of the invention are the following: the provision of a printer embodying means for bodily moving a printing roll and its associated inking roll toward and away from the platen and means for pivotally adjusting the printing roll and inking roll as a unit with respect to the platen; the provision of a printer embodying means adjustably mounting the printing roll for swinging movement toward and away from the inking roll; and the provision of a printer having a printing roll provided with a printing surface adjustably mounted for endwise movement and for rotative movement relative to the platen.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the drawings forming part of this specification, and in which:

Fig. 1 is a view in side elevation of a printer embodying the invention;

Fig. 2 is a view taken along lines 2—2 of Fig. 1;

Fig. 3 is a view in side elevation taken from the side of the printer opposite to that of Fig. 1;

Fig. 4 is a view in section taken along line 4—4 of Fig. 2;

Fig. 5 is a view in longitudinal section of the multiadjustable printing roll of the apparatus; and

Fig. 6 is a view of an adjusting mechanism.

Referring to the drawings for more specific details of the invention, the printer is provided with a supporting frame comprising a pair of opposed end frames 10 having legs 12 interconnected by cross members 14 and 16. Carried by and secured to the cross members 14 of the end frames 10 is an open-topped rectangular carriage bed 18 which has secured to opposite sides thereof posts 20 and 22 serving as the journal supports for a shaft 24 having secured thereto a platen 26. Shaft 24 has three sprockets 28, 30 and 32 affixed thereto.

The carriage bed 18 is provided with guide

2

grooves 34 in the outer side walls thereof, said grooves serving to receive inturned feet 36 of vertically disposed skirt plates 38 secured to the outer sides of carriage plates 40, said carriage plates being mounted in this manner on each side of the platen 26 for guided sliding movement on the bed 18 toward and away from the platen. Plates 40 are provided with dependent flanges 42 having in threaded engagement therewith worm shafts 44, said shafts 44 being rotatably supported in the end walls of carriage bed 18 and in transverse webs 46 integral with said bed. The worm shafts may be anchored to the webs 46 as by thrust collars 48 secured to the shafts. At their outer ends the shafts are provided with feed handles 50. Rotation of the shafts through the medium of the handles is effective to move the carriage plates 40 either toward or away from the platen 26.

Roller carriages, indicated generally at 52, comprising bottom walls 54 and spaced side walls 56, are pivotally mounted on carrier plates 40, as by pivot bolts 58. Journalled in the side walls 56 of the carriages are shafts 60 having secured thereon inking rolls 62. The rolls 62 are partially immersed in ink 64 carried by trays 66, preferably of a suitable acid proof plastic, said trays being removably secured in any suitable manner between the carriage walls 56. The rolls 62 are provided with doctor bars 68 adjustably mounted between the side walls, said bars being adjustable by set screws 70 to vary their degree of ink scavenging in order to obtain the desired ink film for the printing operation.

Pivotally secured to the side walls of the roller carriages are sets of radius arms 72. The radius arms of the right hand carriage, as viewed in Fig. 4, serve as the bearing supports for a shaft 74 having secured thereon a first impression printing roll 76. The radius arms of the left hand carriage serve as bearing supports for a shaft 78 having slidably mounted thereon a second impression printing roll 80. Outwardly of the roll 80, the shaft 78 is provided, as indicated in Fig. 5, with threaded portions 82 and 84. Roll 80 is adjustably secured to the shaft 78 between thrust washers 86 and 88 which are keyed to the shaft, as indicated at 90 and 92, and maintained in pressing engagement with the ends of the roll by nuts 94 and 96 in threaded engagement, respectively, with threaded portions 82 and 84 of the shaft.

Each of the radius arms 72 is provided with an outwardly projecting pivotally mounted hub ele-

ment 98 transversely apertured and internally threaded to receive the threaded end of a set screw 100. The set screws 100 extend through pivotally mounted hub elements 102 carried by carriage side walls 56 and are in opposite hand threaded engagement with said hub elements. Rotative movement of the set screws 100 serves to rock the radius arms either toward or away from the inking rolls 62, and by adjusting these set screws the proper contactual relation between the printing rolls 76 and 80 and their respective inking rolls 62 may be obtained.

Any slight rotative adjustment of the inking and printing roll sets as a unit with respect to the platen 26 is obtainable by means of set screws 104 which are in threaded engagement with brackets 106 and contactual engagement with the walls 54 of the carriages 52. The brackets 106 are fixedly secured to carrier plates 40, and it will be appreciated that rotative movement of the two set screws 104 of each carriage in opposite directions will serve to pivotally move the carriage about the pivot bolt 58. Set screws 108 extending through skirt plates 38 serve to secure the carriage plates 40 to the bed 18.

The conveying system for the tape 110 to be printed comprises feed roll 112 rotatably mounted on spindle 114 carried by post 20; carrier or idler rolls 116 and 118 fixed, respectively, to shafts 120 and 122, with shaft 120 being journalled for rotation in cross arm 124 secured to post 20, and with shaft 122 being journalled for rotation in post 20; and rewind roll 126 mounted on shaft 128 journalled for rotation in arm 130 carried by post 20. The surfaces of idler rolls 116 and 118 are knurled, or finely grooved, to prevent a gummed tape from adhering to the rolls as the tape is conveyed to the rewind roll 126.

The tape drive system adapted to cause the tape to be moved from feed roll 110, around platen 26 in successive engagement with printing rolls 76 and 80, over idler rolls 116 and 118 to rewind roll 126 comprises: motor 132 having a belt drive connection 134 with a variable speed transmission 136, the output shaft 138 of which carries sprocket 140 in driving relation to chain 142 passing over sprocket 28 on platen shaft 24; a drive take-off from shaft 24 comprising sprocket 32, chain 144 in driving relation to sprockets 146, 148, 150 and 152 carried, respectively, by idler roll shaft 120, idler roll shaft 122, stub shaft 154 journalled in arm 130, and stub shaft 156 journalled in arm 124; a drive take-off from stub shaft 154 to rewind roll 126 comprising gear 158 carried on shaft 154 and in mesh with gear 160 carried on stub shaft 162 journalled in arm 130, said gear 160 being in driving relation with rewind roll shaft 128 which, in turn, has an automatically adjustable friction drive, not shown, with the rewind roll 126 to compensate for the variable surface speed of the tape as the tape roll on rewind roll 126 increases in diameter; and another drive take-off from shaft 24 comprising sprocket 30, chain 162 passing around idler sprockets 164 mounted for rotation on post 20, sprockets 166 on shafts 168 coinciding with the pivotal axes of radius arms 72, sprockets 170 carried on inking roll shafts 60, idler sprockets 172 mounted for rotation on arms 174 secured to end frames 10, idler sprockets 176 carried on shafts 178 journalled in the side of bed 18, and vertically adjustable idler sprocket 180 carried on shaft 182 residing within slot 184 of post 20; and a drive take-off from shafts 168 to the printing rolls 76 and 80 comprising gears 186 on shafts 168 in mesh with gears 188 which, in turn, are in mesh with gears 190 and 192 carried on printing roll shafts 74 and 78. Gears 188 are rotatably mounted on pins 194 which are adjustably positioned within substantially horizontally extending arcuate slots 196 formed in arms 198 fixedly secured to the carriage 52. Gears 188 are thus adapted to drivably connect gears 186 with variably sized gears 190 and 192, such variation in these latter gears occurring when the printing rolls and attached gears 190 and 192 are removed to be replaced with printing rolls of other sizes.

With the drive system in operation, reference being had to Fig. 4, the chains 142, 144 and 166 travel in a counter-clockwise direction to cause the platen 26, the tape feed roll 112, inking rolls 62, idler rolls 116 and 118, and rewind roll 126 to travel in the same direction. Printing rolls 76 and 80 travel in a clockwise direction. The tape 110 thus travels in a counter-clockwise direction from feed roll 112 to rewind roll 126.

With the drive system operating as described, the roller carriages 52 may be backed away from platen 26, without necessitating any stopping of the drive system, by rotation of worm shafts 44. This backing away, as a unit, of each inking and printing roll set enables the ready adjustment of the printing rolls with respect to the inking rolls to place the type on the printing rolls and to obtain the desired contactual pressure between the printing and inking rolls, such adjustment being made by means of the set screws 100. When the proper adjustment has been made, the carriages 52 are moved toward the platens to bring the printing rolls into printing contact with the tape. If it is desired to pivotally adjust the carriages 52 slightly to vary the printing pressure of rolls 76 and 80 along their lines of engagement with the tape, this may be done, as previously described, by adjustment of the set screws 104.

If, after a test run of printing has been made, it is found that the second printing impression made by roll 80 does not register in the desired complementary manner with the first printing impression made by roll 76, the roll 80 may be adjusted lengthwise of its supporting shaft 78 or may be rotated relative to said shaft to obtain the desired registrations of the first and second printing impressions. Adjustment of roll 80 lengthwise of its supporting shaft, or transversely of the platen is achieved by loosening the lock nut 94, rotating the nut 96, and tightening the lock nut 94. Rotative adjustment of the roll relative to shaft 78 in order to longitudinally orient the second printing impression with the first impression on the tape is achieved by loosening lock nut 94, turning the roll 80 in the desired direction, and tightening the lock nut. It will be noted that the keying of washers 86 and 88 to shaft 78 serves to prevent rotative movement of the roll 80 relative to shaft 78 while the nuts 94 and 96 are being loosened or tightened.

From the foregoing description, it will be seen that the subject printing apparatus embodies novel means for moving and adjusting the printing assemblies as units relative to the platen and for adjustably registering a printing roll with respect to either the tape to be printed, or another printing roll, and while a preferred embodiment of the apparatus has been shown and described it is to be understood that all substantial equivalents of said embodiment are with the scope of the invention.

What is claimed is:

1. A machine of the class described comprising a support frame, a horizontally disposed carriage bed carried by said frame, a pair of oppositely disposed spaced parallel post members extending upwardly from said frame, a shaft journalled for support in said post members, a cylindrical platen secured to said shaft, a carriage support plate connected to said carriage bed for horizontal sliding movement thereon toward and away from said platen, screw shaft means interconnecting said support plate and bed and rotatably operable to adjustably move said plate with respect to said bed, a carriage base plate superposed on said support plate and connected to said support plate for pivotal movement with respect thereto about a vertical axis by removable bolt means, means carried by said support plate in engagement with said base plate adapted to adjustably secure said base plate in a selected pivotal attitude with respect to said support plate, a pair of spaced parallel carriage wall plate elements extending upwardly from the side edges of said base plate and fixedly carried thereby, a first shaft journalled for rotation in said wall plate elements, an inking roll secured to said shaft, a pair of parallel oppositely disposed lever arms pivotally connected at their lower ends to said wall plate elements and having their common pivotal axis disposed between said platen shaft and said inking roll shaft and at a lower level than said inking roll shaft, a shaft journalled in the upper ends of said lever arms, a printing roll secured to said shaft, and set screw means carried by said wall plate elements and connected to said lever arms adapted to adjustably rock said arms toward and away from said inking roll and away from and toward said platen.

2. A machine of the class described comprising a support frame, a horizontally disposed carriage bed carried by said frame, a pair of oppositely disposed spaced parallel post members extending upwardly from said frame, a shaft journalled for support in said post members, a cylindrical platen secured to said shaft, a carriage

support plate connected to said carriage bed for horizontal sliding movement thereon toward and away from said platen, screw shaft means interconnecting said support plate and bed and rotatably operable to adjustably move said plate with respect to said bed, a carriage base plate superposed on said support plate and connected to said support plate for pivotal movement with respect thereto about a vertical axis by removable bolt means, means carried by said support plate in engagement with said base plate adapted to adjustably secure said base plate in a selected pivotal attitude with respect to said support plate, a pair of spaced parallel carriage wall plate elements extending upwardly from the side edges of said base plate and fixedly carried thereby, a first shaft journalled for rotation in said wall plate elements, an inking roll secured to said shaft, a pair of parallel oppositely disposed lever arms pivotally connected at their lower ends to said wall plate elements and having their common pivotal axis disposed between said platen shaft and said inking roll shaft and at a lower level than said inking roll shaft, a shaft journalled in the upper ends of said lever arms, a printing roll secured to said shaft, means securing said printing roll to said shaft for selectively adjustable movement endwise thereof and for selectively adjustable turning movement thereon, and set screw means carried by said wall plate elements and connected to said lever arms adapted to adjustably rock said arms toward and away from said inking roll and away from and toward said platen.

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