Sept. 19, 1961 A. H. NELLS ET AL 3,000,299

PRINTING MACHINES

Filed Jan. 18, 1960 5 Sheets-Sheet 1

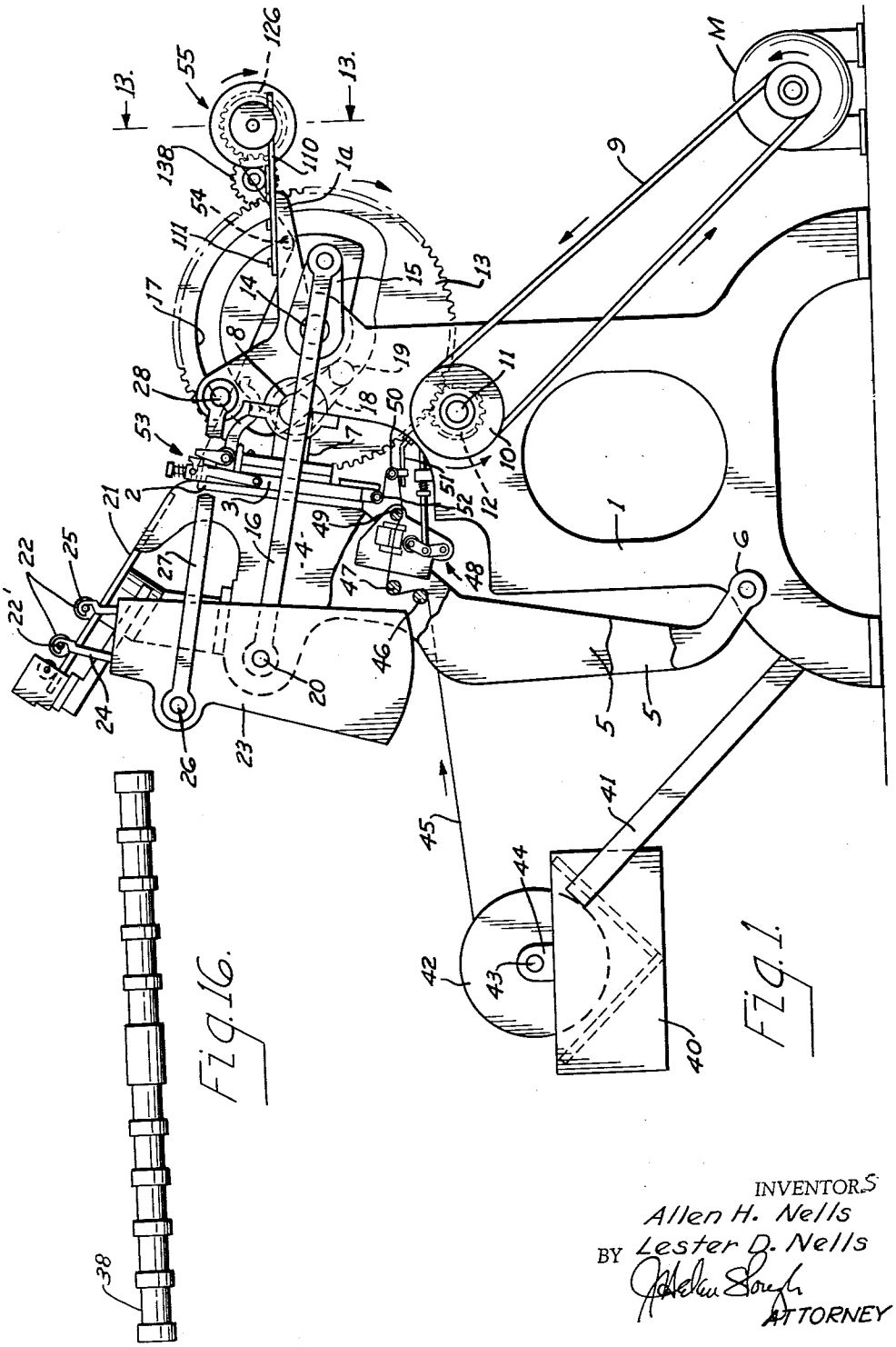


Fig. 1.

Fig. 16.

INVENTORS
Allen H. Nells
BY Lester D. Nells
ATTORNEY

Sept. 19, 1961 A. H. NELLS ET AL 3,000,299

PRINTING MACHINES

Filed Jan. 18, 1960 5 Sheets-Sheet 2

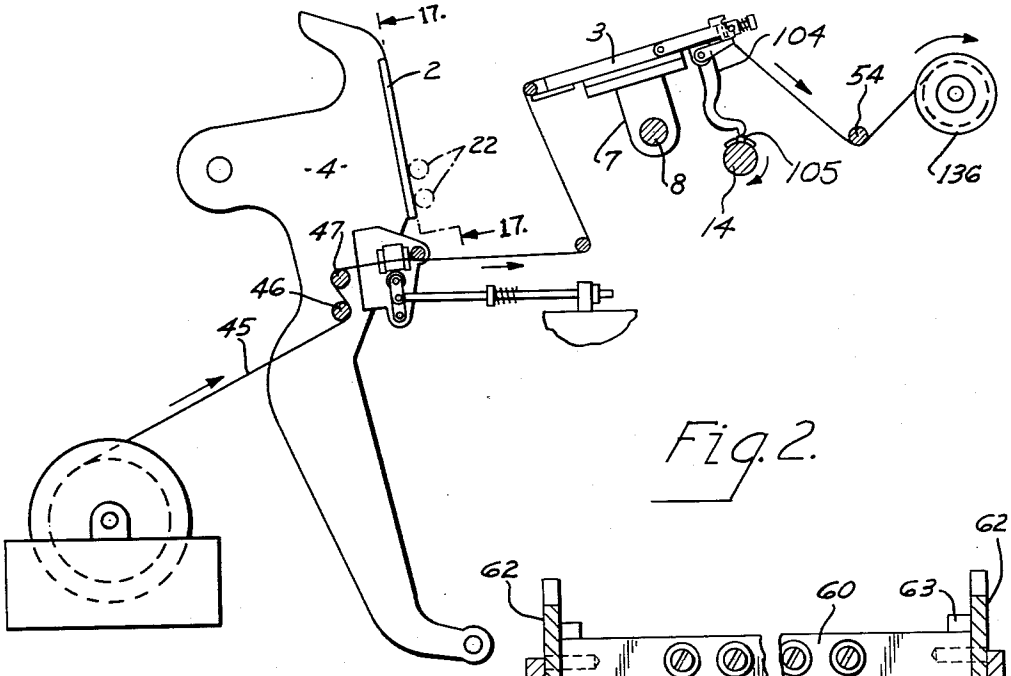


Fig. 2.

Fig. 4.

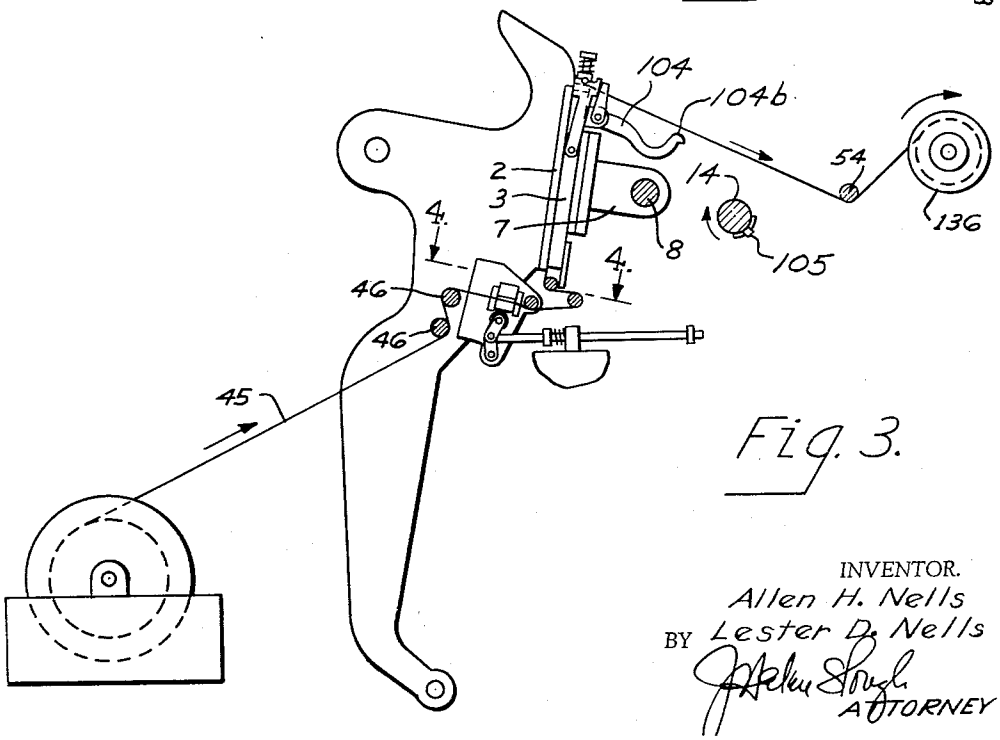


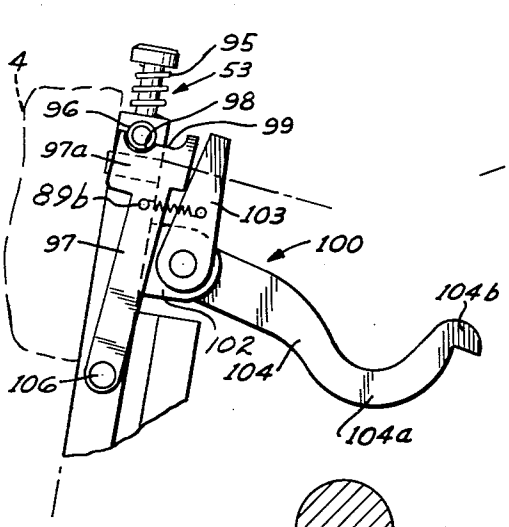
Fig. 3.

INVENTOR.
Allen H. Nells
BY Lester D. Nells
ATTORNEY

Sept. 19, 1961 A. H. NELLS ET AL 3,000,299

PRINTING MACHINES

Filed Jan. 18, 1960 5 Sheets-Sheet 3



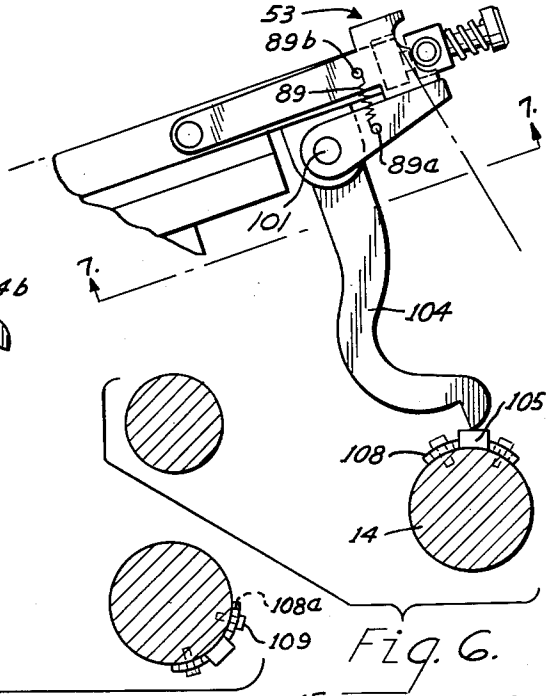


Fig. 6.

Fig. 5

Fig. 8.

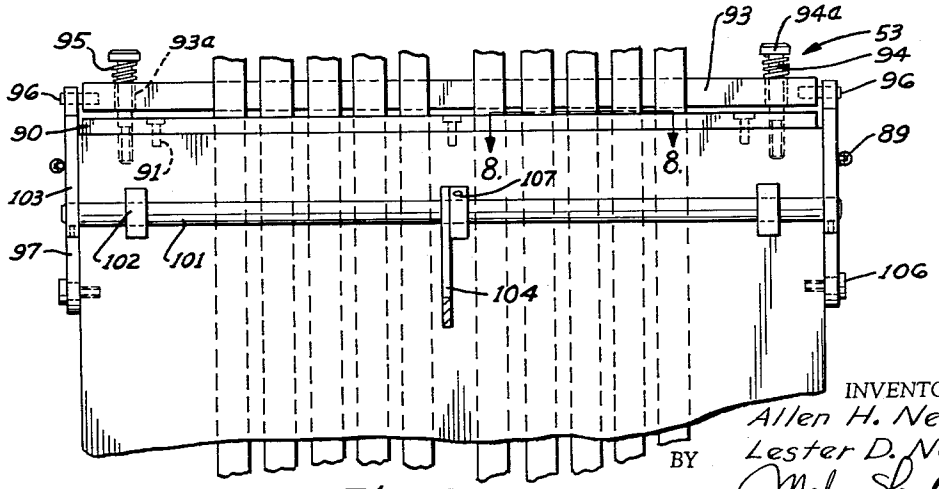


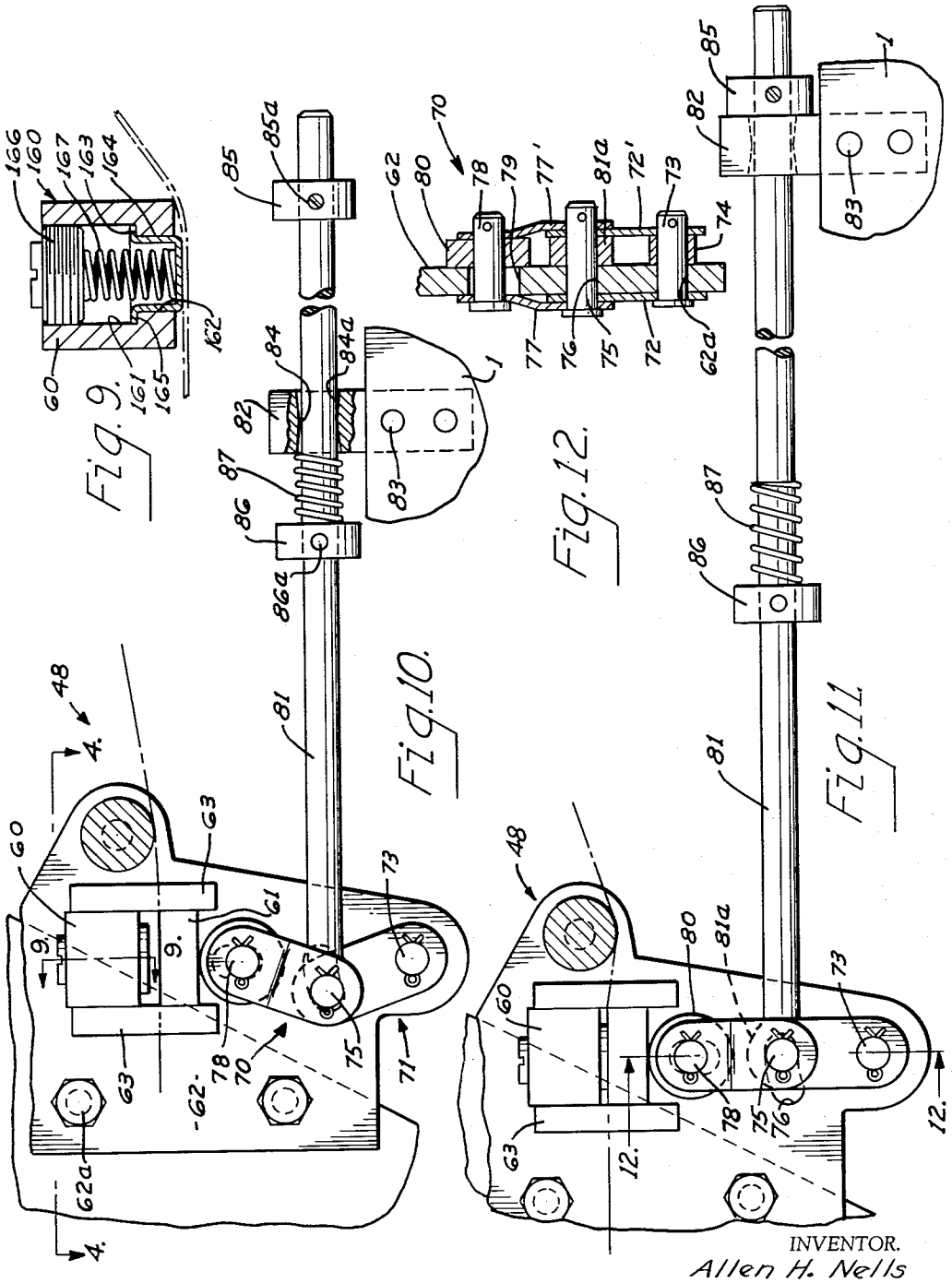
Fig. 7.

INVENTOR.
Allen H. Nells
Lester D. Nells
BY
ATTORNEY

Sept. 19, 1961 A. H. NELLS ET AL 3,000,299

PRINTING MACHINES

Filed Jan. 18, 1960 5 Sheets-Sheet 4



INVENTOR.
Allen H. Nells
Lester D. Nells
BY
ATTORNEY

Sept. 19, 1961 A. H. NELLS ET AL 3,000,299

PRINTING MACHINES

Filed Jan. 18, 1960 5 Sheets-Sheet 5

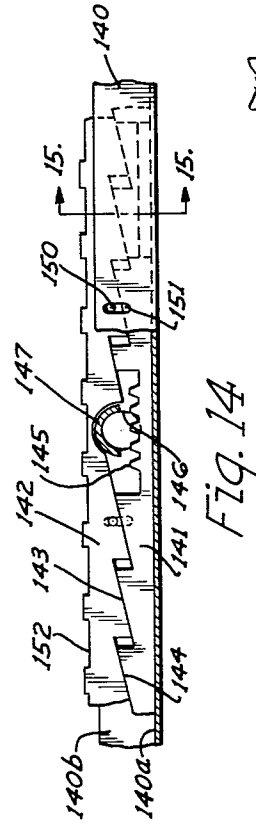


Fig. 14

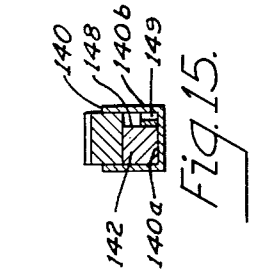


Fig. 15.

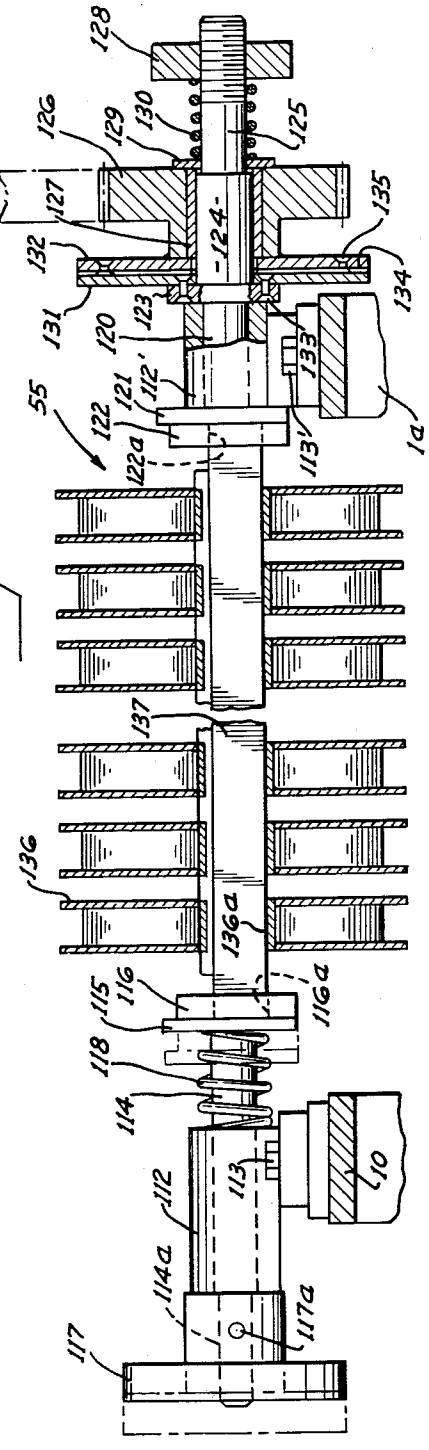


Fig. 13.

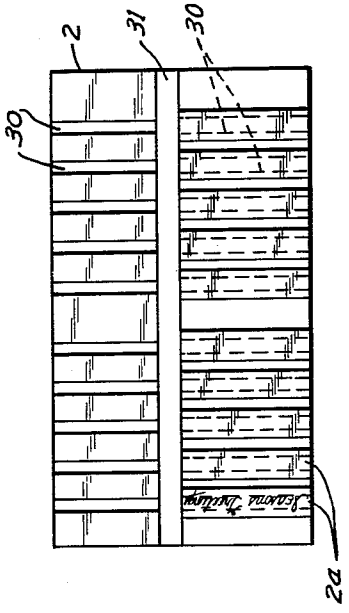


Fig. 17.

INVENTORS
Allen H. Nells
BY Lester D. Nells
Helen S. Hough
ATTORNEY

United States Patent Office 3,000,299 Patented Sept. 19, 1961

3,000,299

PRINTING MACHINES

Allen H. Nells, Thompson, and Lester D. Nells, Chardon, Ohio, assignors to Diamond Printing Machinery Company, Cleveland, Ohio, a company of Ohio

Filed Jan. 18, 1960, Ser. No. 3,101
8 Claims. (Cl. 101—291)

This invention relates to improvements in printing presses and relates more particularly to means adapted for use with conventional job presses which adapt the press for use simultaneously with a plurality of rolls of tape, ribbon, etc. whereby the same may be simultaneously imprinted by the press mechanism, and an improved method for accomplishing the same.

It is an object of this invention to provide an improved feeder device for indexing continuous strip material through a printing press.

It is a further object of the invention to provide such a device whereby a plurality or ribbon-like strips of material are simultaneously progressively printed on a single machine.

Yet another object of this invention is to provide a device of the above type whereby each of a plurality of strips is individually and separately printed with a sign or symbol which may differ from that of the other said ribbons.

Still another object of this invention is to provide a feeder having the above characteristics wherein the printed matter for any given ribbon may be quickly and easily changed from one sign or symbol to another.

Another object of this invention is to provide a device having the above characteristics which is detachably mounted to the press and wherein the press is operable in a conventional manner with said device mounted to said press.

Further objects of this invention and the invention itself will be understood from the following description and the appended drawings, in which said drawings:

FIG. 1 is a side elevation of a platen-type printing press incorporating therewith the automatic feeder attachment of this invention;

FIG. 2 is a semi-diagrammatic view showing the main operating parts of the press and feeder in one operative position;

FIG. 3 is a view similar to FIG. 2 showing the parts of the press in another operative position;

FIG. 4 is a view taken along the line 4—4 of FIG. 3;

FIG. 5 is an enlarged detail of a gripper mechanism associated with the platen, said gripper being shown in a closed position;

FIG. 6 is a view similar to FIG. 5 showing the gripper in an open position;

FIG. 7 is a view of the platen as seen from the back thereof taken along the line 7—7 of FIG. 6;

FIG. 8 is a view taken along the line 8—8 of FIG. 7;

FIG. 9 is a sectional view of an automatic tension adjusting device taken generally along the line 9—9 of FIG. 10;

FIG. 10 is a detail of a gripper mechanism associated with the chase bed, said gripper being shown in an open position;

FIG. 11 is a view similar to FIG. 10 showing the gripper in a closed position;

FIG. 12 is a sectional view taken along the line 12—12 of FIG. 11;

FIG. 13 is a partial section taken generally along the line 13—13 of FIG. 1;

FIG. 14 is a partial section of a spindle for mounting rewind spools;

FIG. 15 is a sectional view taken along the line 15—15 of FIG. 14;

FIG. 16 is a plan view of a typical ribbon guide roll; and

FIG. 17 is a plan view of the chase as viewed from the line 17—17 of FIG. 2.

The automatic feeder device of this invention is herein illustrated and described as applied to a platen type printing press of conventional design. It may, however, be applied to a cylinder type press with suitable adaptation. The press comprises in the form illustrated herein, the usual pivotally mounted chase and pivotally mounted platen so mechanically interrelated and timed that the chase and platen pivot alternately toward and away from each other in a series of continuing cycles. When pivoted toward each other, the two members make flatwise contact whereby the printing operation is accomplished, and when they are pivoted away from each other, the chase is inked by a pair of inking rollers.

In this invention, one or more rolls of ribbon-like material are indexed through the selected type machine whereby successive portions of the indexed material are printed and different rolls may have different or similar print imprinted thereon.

Referring now to the drawings, in all of which like parts are designated by like reference characters and particularly to FIG. 1, the platen type printing press comprises a frame **1**, a chase **2** and a platen **3**. The chase **2** is mounted for arcuate movement toward and away from the platen by means of a chase bed **4** having downwardly extending legs **5** journaled adjacent the lower portion of the frame as indicated at the journal **6**. The platen **3** is secured to a rocker member **7** which is pivotally mounted to the frame **1** by means of a rocker shaft **8**.

The initial source of power for operating the chase and platen comprises a motor M connected through a belt **9** to a pulley **10** rotatably mounted upon the frame **1**. The pulley **10** is mounted upon a drive shaft **11** having coaxially mounted therewith a pinion **12**.

The pinion **12** intermeshes with and drives a relatively large, cam gear wheel **13** rotatably mounted to the frame by means of a main shaft **14**. Said main shaft is also provided with a crank **15** mounted thereon, said crank adapted to cause reciprocating pivotal movements of the chase bed **4** through a connecting rod **16**. The connecting rod **16** is pivoted to the crank **15** at one end and to a shaft **20** of the chase bed at the other end thereof whereby each rotation of the main shaft **14** causes a movement of the chase **2** away from and back to the position as shown in FIG. 1.

Simultaneous pivoting of the rocker member **7** and the platen **3** is effected by means of a recessed cam race **17** of the cam gear wheel **13**. A crank **18** is secured adjacent one end of the rocker shaft **8** and is provided at its free end with a cam follower **19** which projects into the recessed cam race **17**. The configuration of the cam race is such that with each rotation of the cam gear wheel **13**, the platen is pivoted away from and back to the position of FIG. 1 synchronously with the similar movement of the chase **2**.

Operation of the inking rolls is conventional according to printing machines of the platen type. A disk **21** is mounted to and projects angularly above the chase bed **4** whereby said disk and said chase bed provide a continuing track over which the inking rolls **22** pass. A roller frame **23** is pivoted at the shaft **20** of the chase bed **4** and has resiliently mounted thereto a plurality of rods **24** having hooks **25** formed at the upper ends thereof. The rods **24** are biased longitudinally inwardly toward the rollers frame **23** and the hooks **25** hook over axle shafts **22'** which project beyond either end of the inking rolls **22** to bias said rolls generally in the direction of the shaft **20** thereby maintaining them firmly in contact with the disk **21** as shown in FIG. 1.

The roller frame 23 is provided with a stub shaft 26 which is spaced above the shaft 20 and positioned adjacent an outer edge of said roller frame. A connecting link 27 is pivotally mounted at one end thereof to the stub shaft 26, the other end of said connecting link being pivotally mounted to the upper end of the frame 1 by means of a stub shaft 28.

From the above description, it will be understood that when the chase bed is pivoted away from the frame 1 by the crank 15, the roller frame 23 is caused to pivot clockwise (as shown in FIG. 1) because of its connection to the frame through the connecting link 27. This motion will cause the inking rolls 22 to move across the disk 21 and down the face of the chase 2 in a well known manner. When the chase bed 4 reverses direction and pivots toward the frame 1, the inking rolls 22 will, of course, move upwardly over the chase and back across the disk.

The foregoing is a brief disclosure of one printing press to which the device of the present application can be applied. It will be understood that this machine is conventional in itself and that other machines, varying in details of design, may be adapted for use with the invention.

The embodiment as shown in the above platen type printing press comprises gripping mechanisms associated respectively with the chase and bed or platen, each gripper adapted to grasp the material during a portion of each operating cycle. The grippers, preferably according to the form illustrated, operate alternately in order that the material when held by one said gripper is free to slide between the jaws of the other said gripper. Means for maintaining a constant tension upon the material to assure its proper movement through the press is, in the within embodiment, achieved by the use of a rewind spool which is driven through an over-riding clutch mechanism.

The invention as herein illustrated is preferably adapted for the simultaneous printing of a plurality of ribbons. Each ribbon is fed into the press and is indexed across the chase and platen in a continuing series of progressive movements whereby a name, greeting, or other design is repeatedly printed upon the ribbon at predetermined intervals of its length. The chase, as shown in FIG. 17, contains a plurality of flat, type slugs 2*a* corresponding to the number of ribbons to be printed, said type slugs being variable in their printing designs from one ribbon to another if so desired.

The type slugs 2*a*, as herein illustrated in FIG. 17, are interfitted with the chase 2 by means of vertically disposed grooves 30 in the face of said chase in a conventional manner. The chase is also provided with a horizontal groove 31 which divides the grooves 30 into two superposed rows. In this way, a name or greeting can be printed on any given ribbon from either a single type slug positioned in one of the grooves 30 or from a pair of aligned slugs positioned in a pair of aligned grooves 30. Thus, the greeting may be variously spaced or two different greetings used on the same ribbon. For a long name or greeting, a type slug of sufficient length to be mounted in two vertically aligned grooves simultaneously may be used.

The unprinted ribbon is rotatably stored in a ribbon box 40, said ribbon box being secured to the chase side of the press by means of a bracket 41 extending upwardly and outwardly from the base of the frame 1. A plurality of axially aligned ribbon spools 42 are freely, pivotally mounted upon a transversely disposed shaft 43 journaled at either end in upstanding bearings 44 of the ribbon box 40.

The ribbons, indicated at 45 in FIG. 1, pass from the ribbon box 40 to the chase bed 4 and are threaded upwardly between a pair of parallel ribbon guide rolls 46 and 47. The guide rolls 46 and 47 are slightly upwardly and laterally axially offset from each other and extend transversely of the press parallel with the spool shaft 43.

The ribbons pass beneath the guide roll 46 and over the top of the guide roll 47 at which point they are threaded through a gripper mechanism 48. On the opposite side of the gripper 48, the ribbons pass beneath an idler roll 49 from which said ribbons pass from the chase side to the platen side of the machine.

The guide rolls 46—47, the idler roll 49, and the gripper 48 are all secured to and move with the chase bed 4. The gripper 48 is adapted to open when the chase bed is closest to the platen, hereinafter referred to as the "closed" position of the press, and to close or grip when the chase bed is at its most outwardly pivoted position, hereinafter called the "open" position of the press.

From the idler roll 49, the ribbons pass beneath an idler roll 50 mounted to the frame 1 by means of a support 51. The ribbons then reverse direction and pass beneath an idler roll 52 mounted adjacent the lower edge of the platen 3.

The upper edge of the platen 3 is provided with a gripper mechanism 53. The ribbons 45 pass upwardly from the idler roll 52 between the chase and platen and are threaded through said gripper 53 from which they pass beneath another idler roll 54, which is journaled between a pair of outwardly projecting arms 1*a* of the frame 1. From the idler roll 54, the ribbons 45 are directed to a rewind mechanism, generally indicated at 55.

The gripper 53 is adapted to operate complementarily to the gripper 48; the gripper 53 closes when the press is in the closed position and releases when the press is in the open position.

The idler rolls 49, 50, 52 and 54 are substantially smooth, round rolls for allowing free movement of the ribbons 45 through the press. The guide rolls 46 and 47, one of which is illustrated in FIG. 16, are circumferentially circular but are provided with a plurality of longitudinally spaced, flat bottom grooves 38, the width of said grooves being such as to provide guide means for the ribbons 45. It will be understood that both said guide rolls 46 and 47 are substantially identical. The guide rolls function to prevent lateral slipping of the ribbons 45 and to assure that said ribbons will be properly spaced whereby the respective type slugs 2*a* of the chase are aligned therewith for printing.

The mechanism which actuates the gripper 48 is best shown in FIGS. 10–12. It will be understood that a similar mechanism is mounted on either transverse side of the chase bed 4 and that both mechanisms are identical in function and operation, each separate mechanism being a mirror image of the other. For obvious reasons, therefore, only one such actuating mechanism is herein illustrated in detail.

The gripper 48 comprises a pair of superposed, elongated rectangular bars 60 and 61 disposed transversely of the chase bed 4 between a pair of side plates 62 (FIG. 4) secured to either side of said chase bed preferably by means of bolts 62*a*. The side plates 62 are each provided with a pair of vertically disposed, parallel guide members 63. The uppermost bar 60 is fixedly secured at either end thereof between the uppermost end portions of said guide members, and the lowermost bar 61 is slidably nested at the ends thereof between said guide members. The lower bar 61 is adapted to move upwardly against said upper bar 60 to grip the ribbons 45 and downwardly away from said upper bar to release said ribbons.

Each of the side plates 62 has mounted thereon a pair of foldable link units generally indicated at 70 and 71. The lowermost link unit 71 comprises a pair of links 72—72' disposed one on either side of the side plate 62 (FIG. 12). The lower ends of the links 72—72' are interconnected by means of a pin 73 which extends through an aperture 62*a* in said side plate. A spacer 74 preferably is telescoped over the pin 73 to maintain the lower ends of the links 72—72' in fixed, laterally spaced relationship. The spacer 74 is positioned between

the side plate 62 and the link 72' whereby said link 72' is spaced laterally a substantial distance from said side plate.

The upper ends of the link 72—72' are connected by means of a pin 75 which projects through an arcuate slot 76 in the side plate 62. The center line of the arcuate slot 76 defines a point rotated about the axis of the pin 73 and provides a limited arcuate movement of the pin 75.

The relatively uppermost link unit 70 comprises a pair of links 77—77' disposed on either side of the side plate 62, the lower ends of said links 77—77' being journaled upon the pin 75. The upper ends of said links are connected by a pin 78 which rides in a vertically disposed slot 79 in the side plate 62. A roller 80 is rotatably mounted upon the pin 78 and is interposed between the side plate 62 and the upper end of the link 77'. The diameter of the roller 80 is such that the periphery thereof projects above the link 77' and abuts the lower surface of the movable bar 61 of the gripper 48.

A generally horizontally disposed rod 81 is journaled on the pin 75 at one end 81*a* thereof, said end 81*a* of said rod being interposed between the side plate 62 and the link 72'. The rod 81 extends outwardly from the gripper mechanism 48 in the direction of the frame 1 and is slidably mounted to said frame by means of an apertured guide 82 which is fixedly mounted on the frame. The guide 82 is secured to the frame 1 in any suitable manner, such as by rivets 83, and is apertured at 84 to receive the rod 81. The aperture 84 is inwardly tapered from either end to the center of said aperture as indicated at 84*a* to provide for angling of the rod 81 in a manner to be herein later more fully described.

The rod 81 projects substantially beyond the guide 82 at the free end and is provided with an adjustable stop 85 adjacent said end. Said adjustable stop preferably is a ring-like member telescoped over the rod having a set-screw 85*a* in the periphery thereof for longitudinally adjustably securing said stop at any desired position along the rod.

A second stop member 86, which is similar to the stop 85, is telescoped upon the rod 81 and interposed between the guide 82 and the gripper mechanism 48, said stop 86 being secured by a set-screw 86*a*. A coil spring 87 is also telescoped over the rod 81 and is interposed between the stop 86 and the guide 82.

As stated above, both of the side plates 62 have means for actuating the gripper 48 as set forth above, and both said means act in unison with the motion of the press to alternately open and close the gripper.

When the press is in the closed position as shown in FIG. 1, each rod 81 is in the position as shown in FIG. 10 wherein the stop 86 is adjacent the guide 82 and the spring 87 is compressed therebetween. Pressure is thus exerted upon the "knee" of the link units 70—71 causing it to break or fold. This action is possible due to the arcuate slot 76 which allows the pin 75 to move in response to pressure from the rod 81 within the limits of said arcuate slot. Folding of the link units 70—71 causes the roller 80 to move downwardly as the distance between the pins 73 and 78 is consequently shortened. This downward movement of the roller 80 is possible due to the vertical slot 79 in which the pin 78 moves. The bar 61 moves downwardly away from the fixed bar 60 in response to gravity when the roller 80 is retracted downwardly. Thus the gripper 48 opens when the press closes.

Opening of the press causes the reverse motion of the recited parts. The rod 81 is then pulled through the guide 82 until the stop 85 abuts said guide. The rod 81 then exerts a pulling effort on the pin 75 causing it to move to the opposite end of the arcuate slot 76. In this position, the pin 75 is aligned with the pins 78 and 73 whereby the link units 70—71 form a straight line. The pin 78 moves upwardly in the slot 79 thereby forcing the roller 80 upwardly against the movable bar 61. The movable bar 61 is thereby moved upwardly to the closed position when the press is in the open position.

The action of the gripper 48 is well shown in FIGS. 2 and 3. In FIG. 2, the gripper has just closed as the chase bed 4 reaches its most outwardly pivoted position, and in FIG. 3, the gripper has just opened as the chase bed reaches its innermost position. It will be noted that the end 81*a* of the rod 81 travels in a slightly arcuate path due to the relatively fixed position of the pin 75 on the chase bed 4. The pin 75 follows an arc about the pivot point 6 of said chase bed 4 which causes a slight angling of the rod 81. Angling of said rod is permitted by the tapers 84*a* of the aperture 84 in the guide 82, and no binding or strain is exerted between said rod and said guide.

The gripper mechanism 53 is mounted adjacent the upper edge of the platen 3 and is best shown in FIGS. 5–8. Referring specifically to FIGS. 7 and 8, the gripper 53 comprises a base member 90 rigidly secured to the upper edge of the platen 3 by means of countersunk screws 91. As seen in FIG. 8, the base member 90 is provided with a plurality of rectangular, tooth-like projections 92 which extend outwardly a slight distance beyond the face of the platen. The spaces between the projections 92 provide means for guiding the ribbons 45 as they pass upwardly over the face of the platen and through the gripper 53.

A movable bar 93 is disposed in parallel relation above the base member 90 and is adapted to move upwardly and downwardly to respectively release and grip the ribbons 45 which pass beneath said bar. The bar 93 is apertured adjacent the ends thereof as indicated at 93*a* whereby it is adapted to be slidably telescoped upon vertically disposed bolts 94. The bolts 94 are screw-thread fitted through the base plate 90 and into the platen 3. The upper ends of said bolts project upward substantially above the bar 93 and are provided with enlarged heads 94*a*. Coil springs 95 are telescoped over the bolts 94 and are vertically interposed between the heads 94*a* and the bar 93 whereby said bar is biased downwardly against the base member 90.

The extreme ends of the movable bar 93 are provided with longitudinally projecting cam follower studs 96 which project laterially beyond the platen 3. Cam lift arms 97 are pivoted flat-wise to the side edges of the platen by pivot pins 106, the upper ends of said lift arms being enlarged at 97*a* and having upwardly open notches 98 and adjacent lands 99. The notches 98 are concavely rounded and the cam follower studs 96 are biased by pressure from the springs 95 into said notches when the bar 93 is in the closed or gripping position. As shown in FIG. 5, the studs 96 nest loosely and in slightly spaced relation to the notches 98 whereby the bar 93 exerts full pressure upon the base member 90.

Adjacent said notches are the relatively higher lands 99. Movement of the cam lift arms from the position of FIG. 5 to the position of FIG. 6 causes the studs 96 to be cammed upwardly out of the notches 98 and onto the lands 99. In this position, the bar 93 is suspended above the base member 90 and the gripper 53 is in the open position.

The cam lift arms 97 are moved from the position as shown in FIG. 5 to that of FIG. 6 by means of a trip mechanism generally indicated at 100. The trip mechanism comprises a horizontally disposed rod 101 mounted upon the back of the platen 3 by means of bearing supports 102. The ends of the rod 101 project beyond the lateral edges of the platen and are provided with upwardly extending, rigidly secured trip arms 103. Said trip arms are disposed adjacent and in planes with the cam lift arms 97 and are adapted to be pivoted toward said lift arms to move the same to the position as shown in FIG. 6.

A pair of coil springs 89 are connected to the trip arms 103 and their respective cam lift arms 97 to resili-

ently hold said trip arms in the position as shown in FIG. 5. Each trip arm **103** is provided with a laterally projecting stud **89***a* and each lift arm **97** is provided with a corresponding laterally projecting stud **89***b*. The ends of each spring **89** are connected to each pair of studs **89***a*–**89***b* whereby the trip arms are biased into contact with the cam lift arms.

A trip hook **104** is rigidly mounted to the rod **101** by means of a set screw **107** at a generally medial point, said hook having a downwardly curved free end **104***a* terminating in an inverted, foot-like hook **104***b*.

Referring now to FIG. 2, when the press is in the extreme open position, the trip hook **104** projects downwardly at an angle whereby the foot **104***b* touches or is closely adjacent the main shaft **14**. Said main shaft is provided with a radially outwardly projecting trip pin **105** which is aligned with the trip hook **104** and is adapted, upon rotation of the main shaft, to contact the foot **104***b* and pivot the trip hook. The trip pin **105** is secured to an arcuate metal strap **108** which is so curved as to nestingly fit over the arcuate periphery of the main shaft **14**. Said strap **108** is provided with a pair of longitudinal slots **108***a* adapted to receive the shank portions of set screws **109**, said set screws being thread fitted into said main shaft. By means of said set screws and the arcuate slots **108***a*, the trip pin **105** is circumferentially adjustable upon the main shaft to place it in the optimum position for striking the trip hook **104**.

As shown in FIG. 2, the main shaft **14** is constantly rotating in a clockwise direction as indicated by the arrow. The trip pin **105** is so located that it abuts the foot **104***b* at the most open position of the platen thereby causing slight pivotal movement in a counterclockwise direction of the trip hook **104**, the rod **101**, and the trip arms **103**. The upper ends of said trip arms thereby pivot the cam lift arms **97** slightly in a counterclockwise direction to open the gripper **53**.

It will be noted that when the gripper **53** is in the open position (FIG. 6), the enlarged portions **97***a* of the cam lift arms **97** project beyond the face of the platen **3**. When the printing press closes, the chase bed **4** contacts the enlarged portions **97***a* and causes them to pivot slightly in a clockwise direction thereby bringing the notches **98** under the cam follower studs **96** and the bar **93** drops downwardly to the closed position (FIG. 5).

The rewind mechanism **55** which receives the ribbon **45** after it passes from the gripper **53** and beneath the idler **54** is best shown in FIGS. 1 and 13–15. A pair of elongated mounting members **110**—**110'** are secured to the arms **1***a* of the frame **1** preferably by means of bolts **111**. The mounting members **110**—**110'** project outwardly beyond the arms **1***a*, and the rewind mechanism **55** is mounted upon said mounting members.

Referring now to FIG. 13, a pair of coaxially aligned bearings **112**—**112'** are secured adjacent the outer ends of the mounting members **110**—**110'** respectively by any suitable means such as bolts **113**—**113'**.

The bearing **112** provides journal means for a slidable and rotatable shaft **114** having a diametrically reduced portion **114***a* at one end thereof. The opposite end of said shaft **114** is provided with an integrally secured plate **115** having an eccentrically mounted disk **116** secured thereto. The shaft **114** is mounted within the bearing **112** with the plate **115** positioned between the bearings **112**—**112'** and with the reduced portion **114***a* extending outwardly of the bearing **112** in the opposite direction. A hand wheel **117** is fixed upon the reduced portion **114***a* by means of a cotter pin **117***a*, and a coil spring **118** is telescoped upon the shaft **114** and interposed between the bearing **112** and the plate **115**. It will be understood that by pulling on the hand wheel **117** the shaft **114** can be slidably displaced within the bearing **112** and the plate **115** moved from the full to the dotted line showing of FIG. 13 against the bias of the spring **118**.

The bearing **112'** has a shaft **120** journaled therein, said shaft having a plate **121** and a disk **122** secured to one end thereof. The plate and disk **121**–**122** are substantially similar to the plate and disk **115**–**116** and are positioned on the end of the shaft **120** which is directed toward the bearing **112** with the plate **121** abutting the end of the bearing **112'**.

The shaft **120** is also provided with a radially projecting flange **123** which abuts the end of the bearing **112'** opposite the plate **121** whereby said shaft is retained against longitudinal movement within the bearing. Said shaft **120** extends longitudinally from the flange **123** in the opposite direction from the bearing **112'** and is provided with two diametrically stepped portions **124** and **125**. The portion **124** is relatively larger than the portion **125** and provides a journal for a pinion **126** rotatably mounted thereon by means of a sleeve bearing **127**. The relatively smaller stepped portion **125** of the shaft **120** is threaded adjacent the free end thereof and an adjusting nut **128** is thread fitted thereupon. A retainer ring **129** is telescoped over the portion **125** and abuts the pinion **126** and the sleeve bearing **127**. A coil spring **130** is interposed between the retainer ring **129** and the nut **128** whereby when said nut is rotated, varying degrees of longitudinally directed pressure can be exerted upon the pinion **126**.

The flange **123** and the pinion **126** having respectively mounted thereto a pair of clutch plates **131**–**132**. The clutch plate **131** is preferably riveted by means of rivets **133** to the flange **123**, and the clutch plate **132** is welded or otherwise suitably secured to the pinion **126**. A friction disk **134** is preferably secured to the clutch plate **132** by rivets **135**. Said friction disk is interposed between the clutch plate **131**–**132** to provide suitable clutching contact therebetween.

The ribbons **45** are rewound upon a plurality of rewind spools **136** by the rewind mechanism **55**. Each spool is provided with a coaxial, rectangular aperture **136***a* whereby it is adapted to be mounted upon a rectangular spindle **137**. The ends of said spindle interfit rectangular apertures **116***a* and **122***a* respectively of the disks **116**–**122** and bear against the plates **115**–**121** of the shafts **114**–**120**. To mount the spindle **136**, the shaft **114** is displaced longitudinally by pulling of the hand wheel **117**. This allows the ends of the spindle to be inserted in the apertures **116***a*–**122***a*, and release of the hand wheel **117** allows the plate **115** to resiliently press against the end of said spindle due to the bias of the coil spring **118**.

The spindle **137** is rotatably driven through the clutch plates **131**–**132**. Referring now to FIG. 1, the pinion **126** is driven through an intermediate pinion **138** which in turn is driven by the cam gear wheel **13**. The pinion **126** of the rewind mechanism **55** is constantly rotating when the press is in motion, and the clutch plate **132** constantly rotates therewith. However, the rewind spools **136** and consequently the spindle **137** can rotate only intermittently due to the holding of the ribbons by the gripper mechanisms **48**–**53** at different points in the cycle of the press. When the ribbon is thus being held, the clutch plate **132** and its friction disk **134** rotatively slip relative to the clutch plate **131**. The clutch plates **131**–**132** thereby provide an over-riding clutch mechanism which maintains a constant pull upon the ribbon. The amount of tension upon the ribbon can, of course, be regulated by tightening or loosening the adjusting nut **128**.

Details of the spindle **137** are shown in FIGS. 14 and 15. Said spindle is so adapted that the rewind spools **136** may be quickly clamped thereon to be positively held in a predetermined longitudinal relationship.

The spindle **137** comprises a channel shaped housing **140** having a horizontally movable cam member **141** and a vertically movable cam member **142**. The cam member **141** nestingly interfits the housing **140** and is longitudinally slidable upon the bottom surface **140***a* of said channel shaped housing. The upper surface of said cam

member 141 has a plurality of generally upwardly and obliquely facing flat surfaces 143 which make flatwise contact with similarly angled, downwardly facing flat surfaces 144 of the cam member 142. A rack 145 is provided adjacent the intermediate portion of the cam member 141, and a pair of aligned apertures 146 are provided in walls 140*b* of the housing 140, said apertures providing access to said rack by a key or other suitably formed adjusting tool (not shown). The apertures 146 are circular in form, and a semi-tubular spacer 147 connects the upper portions of the peripheries of said apertures and extends transversely of the housing 140 between the walls 140*b*. The spacer 147 is braised, welded, or otherwise suitably secured at the ends thereof to the walls 140*b* at the peripheries of the apertures 146 and provides guide means for an adjusting tool when the same is inserted in said apertures. As particularly shown in FIG. 15, the cam member 141 is recessed at 148 adjacent one side thereof, and a bowed, sheet metal retainer spring 149 is compressively disposed within said recess between said cam member and the adjacent wall 140*b* of the housing 140. Said retainer spring frictionally holds the cam member 141 in any desired longitudinally adjusted position.

The vertically movable cam member 142 is retained against longitudinal movement but allowed vertical movement by means of transversely disposed pins 150 projecting through said cam member. The ends of said pins project into vertically disposed slots 151 of the housing walls 140*b* whereby said cam member 142 is free to move vertically.

The upper surface of the cam member 142 projects slightly above the upper edges of the walls 140*b* and is notched as indicated at 152 to receive the rewind spools 136. Each spool is telescoped over the spindle 137 by means of the rectangular apertures 136*a* of said spools. The inner peripheries of said spools nestingly fit within the notches 152. A suitable key or adjusting tool is then inserted through the apertures 146 and into mesh with the rack 145. As viewed in FIG. 14, a clockwise movement of the tool causes movement of the cam member 141 to the left whereby the inclined surfaces 143 act against the inclined surfaces 144 to cam the member 142 upwardly. The rewind spools are thereby locked into position upon the spindle 137 by the upward pressure of the cam member 142 and the notches 152. By rotating the tool in a counterclockwise direction, the cam member 141 is moved to the right whereby the cam member 142 drops downwardly and the rewind spools can thus be removed.

As hereinbefore described, the gripper mechanisms 48 and 53 are provided with movable bars 61 and 93 and fixed bars or base members 60 and 90 respectively. When the movable member of each gripper moves into gripping contact with its relatively fixed member, it is preferred that automatic tension adjusting means be provided to accommodate to possible variations in the thicknesses of the ribbons passing through said gripper. If one or more of said ribbons 45 is relatively thicker than the other of said ribbons, this tends to hold the gripper members apart thereby allowing slippage of some of the ribbons. Therefore, a tension adjusting device, generally indicated at 160 in FIG. 9, is provided for each of the ribbons in each gripper mechanism. The adjusting devices 160 are housed within the fixed bar 60 of the gripper 48 and within the movable bar 93 in the gripper 53. It will be understood that these adjusting devices are spaced longitudinally along their respective bars above the ribbons. Each adjusting device is substantially identical to the others and only one such device is herein illustrated and described.

Referring now to FIG. 9, each adjusting device 160 is preferably housed within a socket 161 in the bar 60 (or 93), said socket having a concentrically located opening 162 in the bottom wall thereof. The opening 162 is diametrically smaller than the socket 161 thereby providing an inwardly directed step 163 at the bottom of said socket. A cup-shaped plunger 164 is slidably fitted within the opening 162 and projects beneath the lower surface of the bar 60. The uppermost peripheral edge of the plunger 164 has a radially outwardly projecting, circumferentially continuous flange 165 having a diameter slightly smaller than the socket 161. The flange 165 abuts the step 163 thereby limiting the extent to which the plunger projects below the bar 60.

A plug 166 is screw thread fitted within the upper end of the socket 161, and a coil spring 167 interfits the cup-shaped plunger 164 and compressively abuts the lower surface of said plug. It will be readily seen that the plunger 164 is normally biased to its lowermost position by the spring 167. When the bar 60 (or 93) contacts the bar 61 (or the base plate 90), the plungers 164 press against the ribbons 45 and retract within the opening 162 sufficiently to allow closing of the gripper mechanism. Each ribbon is thereby firmly held by a separate plunger, each plunger adapting automatically to the thickness of the adjacent ribbon and the closeness of fit between the fixed and movable members of the grippers. Tension on each ribbon is adjustable by rotating the plug 166 whereby either more or less pressure is exerted upon the plunger 164.

Operation of the automatic feeder device of this invention can be understood by referring to FIGS. 2 and 3 of the drawings. When the platen 3 and the chase 2 are at their most widely separated positions (FIG. 2), the gripper 53 of the platen is caused to release its hold upon the ribbons 45 and the gripper 48 of the chase bed 4 closes to engage said ribbons. As the chase bed 4 moves the chase 2 in the direction of the platen, it carries the ribbons 45 with it thereby unrolling said ribbons from the spools 42 in the ribbon box 40. At the same time, the platen 3 pivots toward the oncoming chase and slides beneath or relative to the ribbons 45, which ribbons are being constantly pulled by the ribbon rewind mechanism 55.

The above operation of the press and feeder device is so timed that exactly the right amount of new ribbon is presented on the face of the platen 3 at precisely the instant when said platen contacts the chase for the next printing (FIG. 3). At the instant of contact of the platen 3 and the chase 2, the gripper 53 closes and the gripper 48 opens. During the opening or backward stroke of the platen, the ribbons are pulled through the gripper 48 and the rolls 46, 47, 49, and 50 back to the position as shown in FIG. 2. At this point, the gripper 53 again opens, the gripper 48 again closes, and the entire cycle is repeated. As noted before, the inking rolls 22 reink the chase 2 between each printing operation.

The feeder attachment as set forth above is adapted to facilitate the printing of one or more ribbons or strips of sheet material. Even though a plurality of ribbons are printed simultaneously, each ribbon may be individually printed with a separate symbol or name by the use of different type slugs.

An advantage of the present device is that it enables an operator to change the printed matter from one form to another quickly and easily by the use of cast flat slugs thereby permitting less costly printing of limited quantities of material. The printed ribbon is easily moved from the rewind mechanism by pulling upon the handle 117 which releases the spindle 137. The rewind spools 136 are quickly removed from the spindle as previously described and replaced with new spools by the use of a simple tool or key. The above features greatly facilitate the printing of small quantities of individualized ribbon.

If it is desired to use the printing press for conventional printing operations, the feeder mechanism can be partially or completely detached from the press or be

allowed to remain thereon. The gripper **48** can be easily deactivated by removing the stops **85** and by sliding the stops **86** on the rods **81** in the direction of the link units **70—71**. The rods **81** will then slide freely within the guides **82** without actuating the gripper **48**.

The gripper **53** can also be deactivated by loosening the set screw **107** of the trip hook **104** and pivoting said trip hook upwardly and securing it in a position whereby the foot **104***b* clears the trip pin **105** of the main shaft **14**.

It will be understood that many departures from the details of this invention as herein described and illustrated may be made without, however, departing from the spirit thereof or the scope of the appended claims.

What we claim is:

1. A device for feeding strip material through a printing press wherein a bed and platen are relatively movable in sequential printing and opening movements, said device comprising a first gripping means mounted to said bed and a second gripping means mounted to said platen, said first gripping means adapted to have strip material threaded therethrough, said bed and platen adapted to have a portion of said strip material disposed therebetween and said second gripping means adapted to have a portion of said strip material threaded therethrough, means responsive to a portion of said opening movement to close said first gripping means and responsive to a portion of said printing movement to open said first gripping means, and means responsive to a portion of said opening movement to open said second gripping means and responsive to a portion of said printing movement to close said second gripping means whereby said material is moved through said press.

2. A device for feeding strip material progressively through a printing press of the type having a bed and platen alternately pivotable toward and away from each other in unison between open and closed positions, said device comprising a first gripper associated with said bed and a second gripper associated with said platen, said first gripper adapted to have said strip material threaded therethrough, said bed and platen adapted to have a portion of said strip material threaded therebetween and said second gripper adapted to have a portion of said strip material threaded therethrough, means for closing said first gripper when said bed is in an open position and opening said first gripper when said bed is in a closed position, and means for opening said second gripper when said platen is in an open position and closing said second gripper when said platen is in a closed position.

3. A device of the type set forth in claim 2 including a rewind mechanism mounted to a stationary frame, said second gripper being adapted to direct a portion of said strip material to said rewind mechanism to be rewound thereupon.

4. A printing press for progressively imprinting strip material comprising a fixed frame, a bed and platen pivotally mounted to said frame for opening and closing movements toward and away from each other, a first gripper mounted to move with said bed and a second gripper mounted to move with said platen, said first gripper adapted to have said strip material threaded therethrough and across said platen and through said second gripper, a rewind mechanism positioned beyond said second gripper and adapted to receive said material for rewinding thereupon, means whereby said rewind mechanism exerts a continual pull upon said material, means closing said first gripper when said bed and platen are in an open position and opening said first gripper when said bed and platen are in a closed position, and means opening said second gripper when said first gripper is closed and closing said second gripper when said first gripper is open whereby said material is indexed through said press.

5. A printing press for progressively imprinting strip material comprising a fixed frame, a bed and platen pivotally mounted to said frame for opening and closing movements toward and away from each other, a first gripper mounted to move with said bed and a second gripper mounted to move with said platen, said first gripper adapted to feed ribbon material from a plurality of spools of ribbons across said platen and through said second gripper, a rewind mechanism positioned beyond said second gripper and comprising a plurality of rewind spools adapted to receive said ribbons to be rewound thereupon, means constantly urging said spools in a rotative direction exerting a continual pull upon said ribbons, means associated with said frame and said first gripper closing said first gripper when said bed and platen are in an open position and opening said first gripper when said bed and platen are in a closed position, and separate means opening said second grippers when said first gripper is closed and closing said second gripper when said first gripper is opened whereby said plurality of ribbons simultaneously are adapted to be indexed through said press.

6. A printing press for progressively imprinting strip material comprising a fixed frame, a constantly rotating main shaft journaled in said frame, a bed and platen pivotally mounted to said frame, means connecting said main shaft to said bed and platen for oscillating said bed and platen between open and closed positions, a first gripper mounted to move with said bed and a second gripper mounted to move with said platen, said first gripper adapted to feed ribbon material across said platen and through said second gripper, a rewing mechanism positioned beyond said second gripper and adapted to receive said material to be rewound thereupon, transmission means between said main shaft and said rewind mechanism whereby said rewind mechanism is constantly yieldably urged to rotate exerting a continual pull upon said material, means associated with said frame and said first gripper closing said first gripper when said bed and platen are in an open position and opening said first gripper when said bed and platen are in a closed position, and means associated with said second gripper and said main shaft opening said second gripper when said first gripper is closed and closing said second gripper when said first gripper is opened whereby said material is indexed through said press.

7. A method of indexing sequential portions of continuous strip material through a press having an oscillating bed and platen which comprises causing the material to move with the bed only during one portion of the printing cycle and causing said material to move with the platen only during another portion of the printing cycle and maintaining a constant pull upon said material in the direction in which it is being indexed.

8. A method of indexing sequential portions of continuous strip material through a press having an oscillating bed and platen which comprises gripping the material to cause it to move with the bed while allowing said material to slip relative to said platen during one portion of the printing cycle and gripping said material to cause it to move with said platen while allowing it to slip relative to said bed during another portion of the printing cycle and maintaining a constant pull upon said material in the direction in which it is being indexed.

No references cited.