Jan. 13, 1970 G. L. STRICKLAND ETAL 3,489,084

BED AND PLATEN PRINTING MACHINE WITH ENVELOPE FEED MEANS

Filed April 25, 1967 3 Sheets-Sheet 1

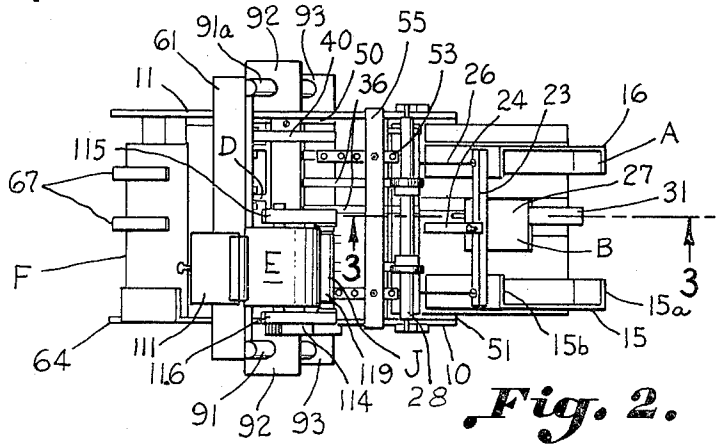


Fig. 2.

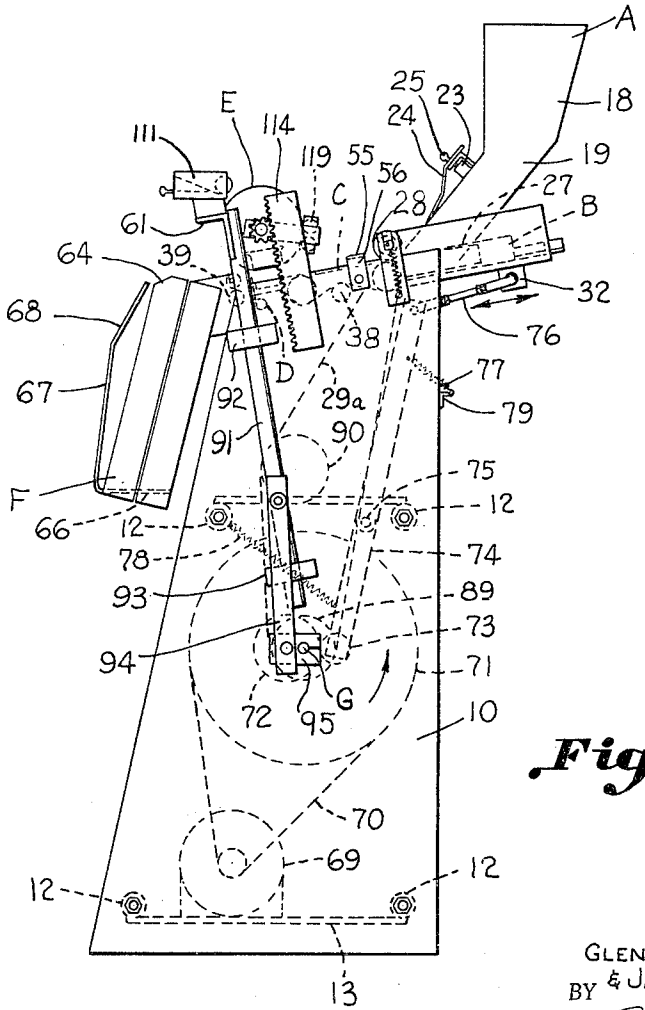


Fig. 1.

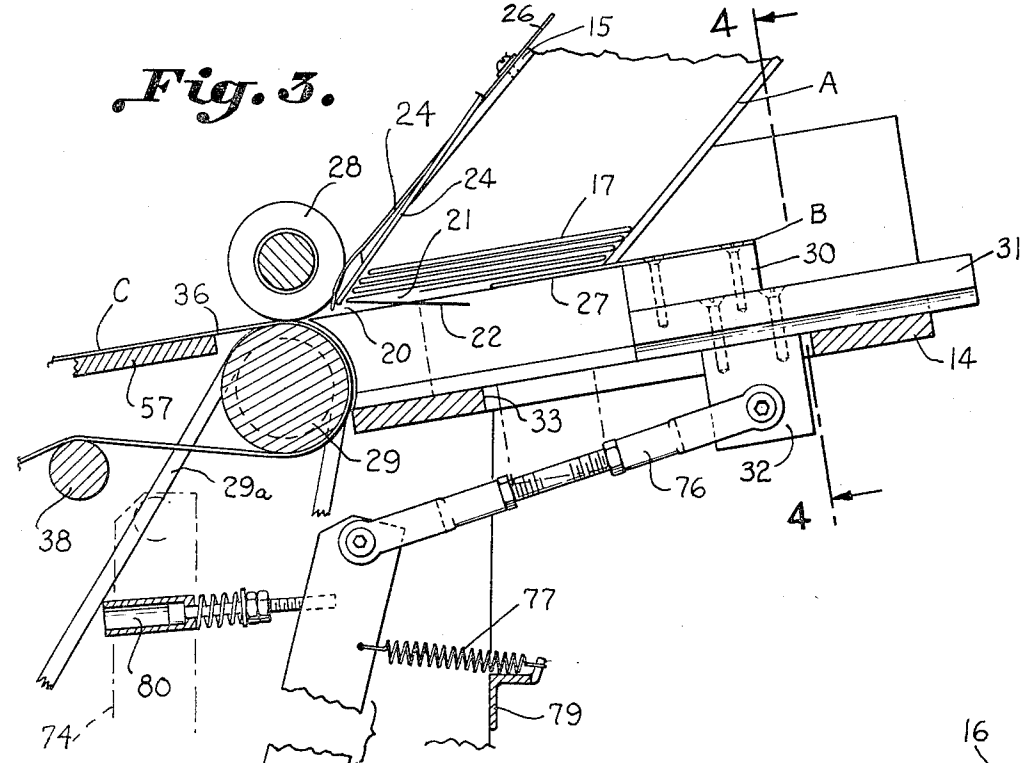
INVENTORS.
GLENN L. STRICKLAND
BY & JACK L. CULBERTSON
Bailey + Doerty
ATTORNEYS.

Jan. 13, 1970 G. L. STRICKLAND ETAL 3,489,084

BED AND PLATEN PRINTING MACHINE WITH ENVELOPE FEED MEANS

Filed April 25, 1967 3 Sheets-Sheet 2

Fig. 3.



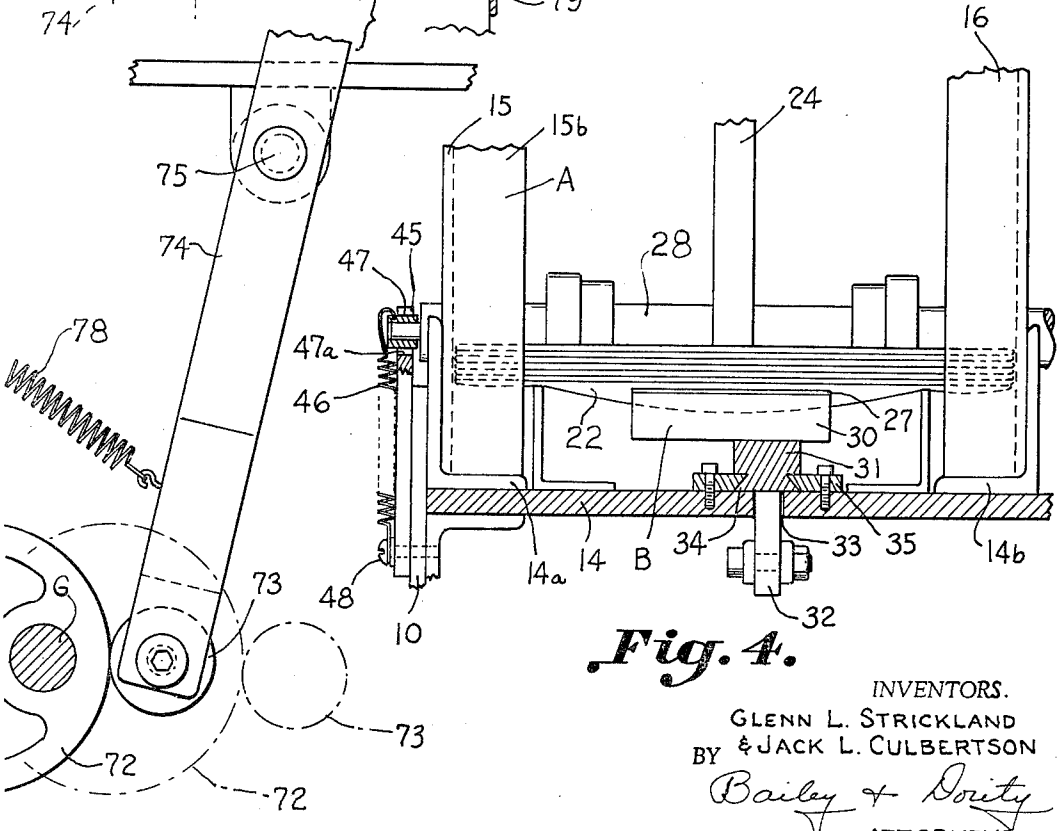


Fig. 4.

INVENTORS.
GLENN L. STRICKLAND
BY & JACK L. CULBERTSON
Bailey & Dority
ATTORNEYS.

Jan. 13, 1970 G. L. STRICKLAND ETAL 3,489,084

BED AND PLATEN PRINTING MACHINE WITH ENVELOPE FEED MEANS

Filed April 25, 1967 3 Sheets-Sheet 3

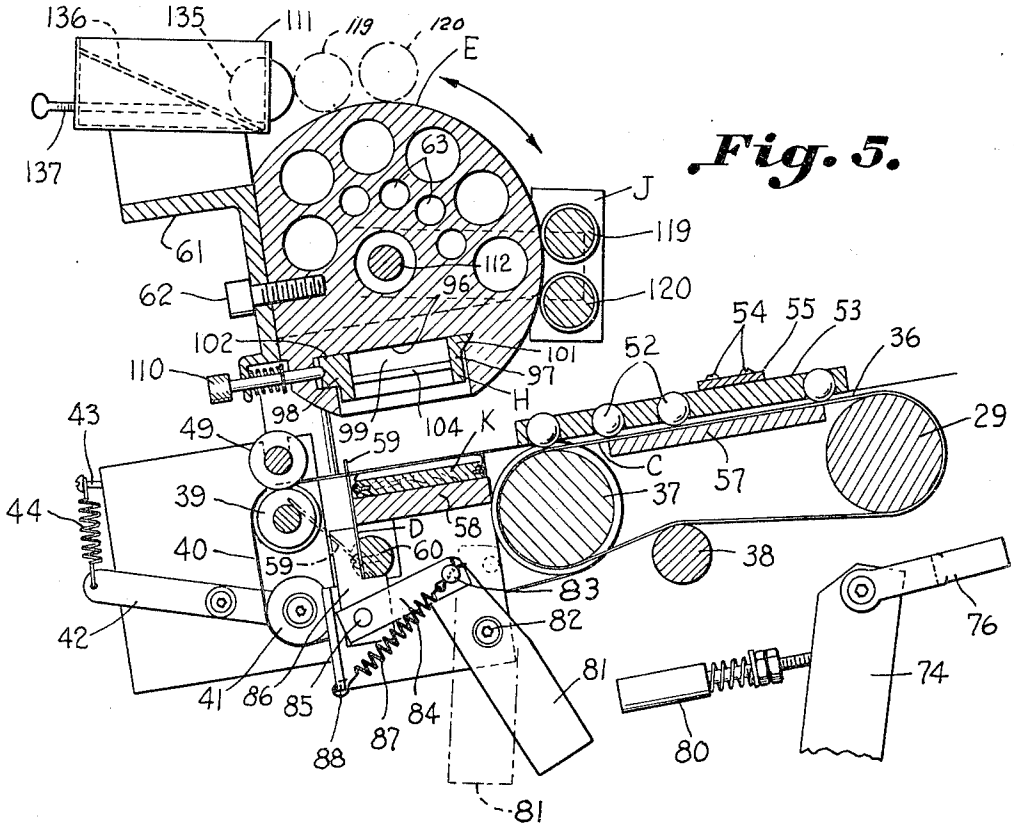


Fig. 5.

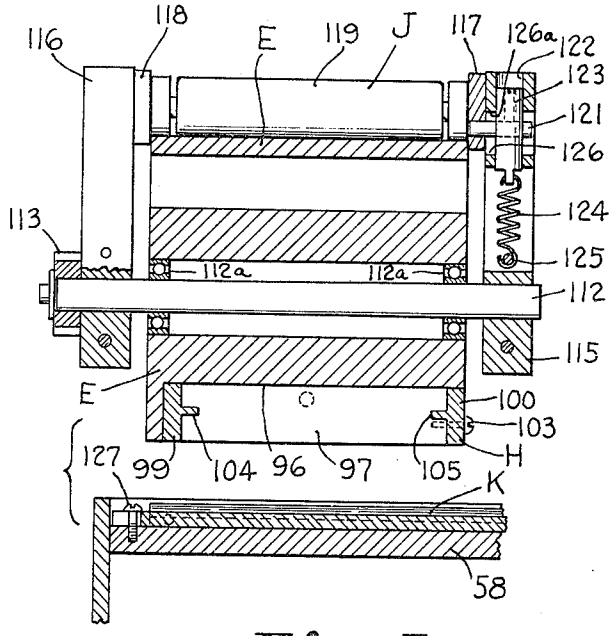
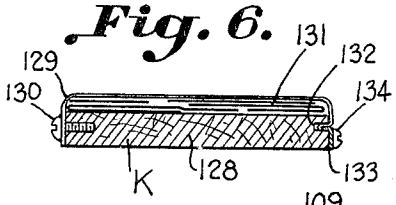


Fig. 7.

Fig. 6.



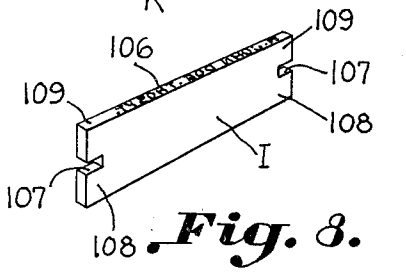


Fig. 8.

INVENTORS.
GLENN L. STRICKLAND
BY & JACK L. CULBERTSON
Bailey + Dority
ATTORNEYS.

United States Patent Office 3,489,084 Patented Jan. 13, 1970

3,489,084

BED AND PLATEN PRINTING MACHINE WITH ENVELOPE FEED MEANS

Glenn L. Strickland, 5 Howland Road, Asheville, N.C. 28804, and Jack L. Culbertson, Cedar Hill Road, Asheville, N.C.

Filed Apr. 25, 1967, Ser. No. 633,620
Int. Cl. B41f 1/00, 1/06, 13/24
U.S. Cl. 101—287 6 Claims

ABSTRACT OF THE DISCLOSURE

The specification discloses a printing press capable of printing headings and the like on items such as envelopes. The envelopes are moved from a hopper by a reciprocating feeder blade onto a conveyor. A reciprocating stop guide arrests the movement of the envelope under a printing head for carrying out the printing operation. The press is provided with a movable platen for quick changeovers from printing one style of envelopes to another.

The invention relates to a printing press, and more particularly to a printing press which is capable of efficiently and rapidly printing headings and the like on items such as envelopes.

Heretofore, printing presses which were utilized for printing headings on envelopes frequently used rotating rubber plates which produced a mediocre copy of print. Since the plate is carried on a cylinder, the leading edge of the type would cause the leading edge of the printed characters to be slightly larger than the center of the printed letter. Such would, also, be the case of the trailing edge of the printed character as compared to the center.

In order for job printers, that is, small printers, to produce an envelope of high quality he must go to a conventional printing press which prints the indicia by reciprocating the printing plates in a substantially vertical manner. Such printing presses operate satisfactory for printing sheets and the like; however, they are relatively slow and expensive and thus, inefficient for printing small items, such as envelopes.

In order for the job printer to produce an envelope of high quality he is restricted as previously mentioned to a machine or press which will print approximately 4,000 envelopes an hour. To increase this speed he must go to a special press which utilizes the rubber plate method of printing thus, sacrificing quality in the printing of the envelope. Moreover, the rubber plate printing press is an expensive device, and as a result, the average jobber cannot afford to make this kind of investment for short run work.

Another problem with such machines is the relatively long period of time necessary to convert the press from printing flat sheets and the like to printing headings on envelopes. As is the case in many businesses, it is desired to maintain the running time of the press at a maximum as compared to the running time and the changeover time.

One of the reasons that the changeover time for the conventional press is long is that the platen has to be built-up while on the press. In order to obtain high quality printing of envelopes which vary in thickness due to the different number of layers of paper, a platen must be positioned directly under the envelope where the printing head is to strike the envelope. The platen is built-up with pieces of paper so that its thickness is the complement of that of the envelope where the printing operation is to take place. In other words, if the total thickness at any one point on the envelope is four layers of paper, and at another point it is only one layer, then the platen must be built-up so that the total thickness of the envelope and platen is the same under the area upon which the printing is to take place.

In the press constructed in accordance with the subject invention ready-made platens are provide so that they can be changed quickly by loosening a single screw and sliding the platen out and reinserting another ready-made plate. These platens are conveniently stored in a suitable library for subsequent use with similar styles of envelopes.

Another problem encountered in printing presses which utilize Linotype slugs carried in a chase is that sometimes the spacing slugs will work-up and come up level with the letters carried on the Linotype slugs to produce a splotch during the printing operation. This results in an unacceptable print. Such a problem would be especially prevalent in high speed printing presses where the centrifugal force is great.

Heretofore, in platen printing presses, after the printing of an envelope had taken place the envelope was either moved to the side or retracted. In the press constructed in accordance with the subject invention the envelope continues in its original direction to a collecting hopper. Thus, the speed of the printing operation can be increased.

Accordingly, it is an important object of the subject invention to provide a high speed and inexpensive printing press for printing letter heads and the like on items such as envelopes.

Another important object of this invention is to provide a printing press wherein such can be readily converted from printing one style of envelopes to another.

Still another important object of the present invention is to provide a printing press with a chase which securely carries Linotype slugs on which letters are embossed so that it is impossible for any part of the form which includes the slugs and spacers to work up.

A further important object of the present invention is to provide a printing press with an efficient feeder for envelopes, a delivery system which includes a stop mechanism for properly positioning the envelopes during the printing operation, and a more efficient carry-through operation of the envelopes after such have been printed.

Still another important object of the present invention is to provide a reciprocating stop mechanism for positively and accurately positioning an envelope or the like under a printing head each and every time. Such allows the press to print several different colors in perfect register.

A further important object of the present invention is to provide a printing press wherein the entire operation of such is synchronized from a single rotating shaft so that each operation can take place at the proper and exact preselected time.

A further important object of the present invention is to provide a printing press having a printing bed incorporating a platen which can be readily changed and a different platen taken from a suitable library can be substituted therefor.

A further important object of the present invention is to provide a printing press having a substantially cylindrical printing head with an inking roller assembly which maintains the inking rolls in contact with the printing head at all times while running at a high rate of speed.

Still a further important object of the present invention is to provide a printing press which requires a minimum of maintenance while achieving high quality printing at a rapid speed.

A further important object of the present invention is to provide a printing press with a loading and unloading system for envelopes and the like, which do not require the machine or press to be stopped during such processes.

The construction designed to carry out the invention

will be hereinafter described, together with other features thereof.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown and wherein:

FIGURE 1 is a side elevation illustrating a printing press constructed in accordance with the present invention,

FIGURE 2 is a plan view illustrating the printing press shown in FIGURE 1,

FIGURE 3 is an enlarged cross-sectional view taken along line 3—3 of FIGURE 2 showing the feeder hopper, the feeder blade, and the drive mechanism for such,

FIGURE 4 is an enlarged cross-sectional view taken along line 4—4 of FIGURE 3 illustrating the bottom portion of the feeder hopper and the feeder blade engaging the flap on a bottom envelope of a stack of envelopes carried in the hopper,

FIGURE 5 is an enlarged sectional elevation illustrating the printing head, the printing bed, and the stop guide for arresting the movement of envelopes under the printing head for carrying out the printing operation,

FIGURE 6 is a cross-sectional view of the platen illustrating the manner in which such is built-up,

FIGURE 7 is an enlarged longitudinal sectional view illustrating the printing head and the apparatus for maintaining the inking rolls in contact with the printing head, and

FIGURE 8 is a perspective view illustrating a Linotype slug constructed in accordance with the present invention.

The drawings illustrate a printing press for printing headings and the like on items such as envelopes. A feed hopper A is provided for carrying a stack of envelopes having their flaps facing downwardly. The hopper A has an elongated opening adjacent the front, bottom portion thereof, and a slot in the bottom thereof, permitting the flap of the bottom envelope of the stack to extend therein. A reciprocating feeder blade B is carried adjacent the bottom of the hopper. An envelope conveyor C is positioned adjacent the front of the hopper. The feeder blade B is provided with means for propelling such forward for engaging the flap of the bottom envelope moving the envelope onto the conveyor C. A reciprocating stop guide D arrests the movement of the envelope adjacent one end of the conveyor C for positioning the envelope for printing. A printing head E reciprocates in a substantially vertical path for printing indicia on the envelope when such is in the arrested position. A receiving hopper F is carried adjacent the end of the conveyor for receiving the printed envelopes. Means is provided for moving the stop guide D out of the path of the envelope allowing the conveyor C to eject the printed envelope from the arrested position to the receiving hopper F. Thus, the path traveled by the envelope from the feed hopper to the receiving hopper is straight and as a result, a faster printing operation can take place. A rotating drive shaft G is coupled by linkage to the feeder blade B, the stop guide D, and the printing head E, for synchronizing the movement of such relative to each other. A chase H is carried in a lower portion of the printing head. The chase is provided with flanges for receiving Linotype slugs I, and spacing slugs which also have slots therein which fit on the flanges in the chase for securing them therein. An inking roll assembly I is carried on the printing head for maintaining the inking rollers in contact with the printing head as such is reciprocated at a high rate of speed.

In order to minimize the changeover time necessary in converting the press from one style envelope to another ready-made platens K are utilized. A platen K can be slipped out of the printing bed and a platen secured from a suitable library can be substituted therefor.

Referring more particularly to the drawings, the printing press is mounted on a pair of spaced vertical side walls **10** and **11**, respectively. Suitable cross-bracing, such as bars **12**, connect the two side walls **10** and **11** together forming a frame. A base plate **13** also connects the side walls together in order to make the frame rigid. Directly below the feeder hopper A is a flat plate **14**, which is secured to the side walls **10** and **11**, respectively, by any suitable means such as angle-irons **14***a* and **14***b*, which are in turn, welded or secured by any suitable means between the flat plate **14** and the side walls.

The feeder hopper A is constructed of two laterally disposed U-shaped members **15** and **16**, respectively. The inwardly turned edges **15***a* and **15***b* of the U-shaped member **15**, and the inwardly turned edges of the U-shaped member **16**, are provided for accommodating a stack of envelopes **17** therebetween. The feed hopper A has a vertical section **18** which maintains the envelopes **17** in a vertical stack. The vertical section **18** terminates in an inclined section **19** which causes the bottom envelope to be displaced forwardly slightly more than the envelope carried thereabove. Such is to aid in the feeding operation. By utilizing a hopper having a vertical section **18** terminating in an inclined portion **19** the weight of the stack of envelopes rest on the trailing edge of the bottom envelope and the U-shaped members **15** and **16**. Such permits a large stack of envelopes to be carried in the feeder hopper A, while permitting the bottom envelope to be easily removed therefrom.

The hopper A has an elongated opening **20** adjacent the front bottom portion thereof, and a slot or opening **21** in the bottom thereof, permitting a flap **22** of the bottom envelope **17** to extend therethrough. A bar **23** is carried between the side U-shaped members **15** and **16**, respectively, of the hopper and supports a center spring-biased separator **24**. The center spring-biased separator **24** is constructed of spring steel, and has one end attached to the bar **23** by means of a screw **25**. The free-end of the center spring-biased separator **24** curves inwardly and extends slightly below the bottom of the hopper into the elongated opening **20**. Such is to prevent more than one envelope from being moved from the hopper at a time. When an envelope is shifted through the elongated opening **20** the center spring-biased separator **24** rides on top of the envelope preventing another envelope from riding thereon. Additional spring tension side separators **26** are carried adjacent the front side of the U-shaped members **15** and **16** for preventing the ends of the envelope from folding up when such is moved from the hopper A onto the conveyor C. These spring tension side separators **26** are constructed of a thin piece of flat wire which extend from the hopper onto the conveyor.

The bottom of a hopper A is open and the bottom envelope **17** of the stack rests on the feeder blade B. The feeder blade B includes a thin flat plate **27** which when moved forward engages the flap **22** of the bottom envelope and moves the envelope forward into engagement with the feed rollers **28** and **29** forming a part of the conveyor C. The flat plate feeder blade **27** is secured by screws to a block **30** which is, in turn, secured by screws to a smaller block **31** which has a reduced portion **32** which extends through an elongated slot **33** in the base plate **14**. In operation the reduced portion **32** is reciprocated within the slot **33** causing the feeder blade **27** to engage the flap **22** of the bottom envelope **17** for moving the envelopes from the hopper to the conveyor. The block **31** has a dove tail portion **34** into which locking pieces **35** engage for guiding the feeder blade assembly when such is being reciprocated.

An envelope conveyor C is positioned adjacent the front of the hopper A for transporting the envelopes from the hopper to the printing head E. The conveyor includes the feed roller **29** which is driven by means of a belt **29***a*. A plurality of laterally spaced belts **36** are connected between the feed roller **29** and a delivery drive roller **37**. A conventional spring-biased tensioning roll **38** is in engagement with the belt or belt **36** for maintaining the proper tension therein. A delivery roller **39** is driven off the delivery roller **37** by means of belt **40**. Tension is maintained in the belt **40** by means of a spring-biased ten-

sioning roller **41**. The spring-biased tensioning roller **41** is journaled on the end of a pivotally mounted lever arm **42** which has its free-end connected to a screw **43** by means of a spring **44**. The belt **40** is carried adjacent the side wall so as not to interfere with the operation of the printing head E and the reciprocating stop guide D.

The feed roller **28**, which is carried directly above the feed roller **29**, is journaled between a pair of spaced vertical bearing posts **45** which have their lower-end anchored to the side walls **10** and **11**, respectively. A spring **46** engages a bearing **47** in which the shaft of the drive roller **28** is journaled and pulls such downwardly so that the drive roller **28** is in engagement with the drive roller **29** and rotates therewith. The lower-end of the spring **46** is anchored by means of a screw **48** to the side frame member **10**. The bearing **47** is allowed to move downwardly within a slot **47***a* and is held in such position by the spring **46**. The delivery roller **39** also has an engaging spring-biased roller **49** carried thereabove for rotating therewith.

After the envelope has been printed roller **37**, which is in engagement with the trailing edge of the envelope, forces such between the rollers **39** and **40**. The drive rollers **39** and **40**, in turn, eject the envelope into the receiving hopper F. The rollers **29**, **38**, **37** and **39** are journaled in side plates **50** and **51**, respectively. These side plates are secured to the side walls **10** and **11**. As shown in FIGURE 2, there are five belts **36** connecting the rollers **29** and **37** and a single belt **40** connecting the roller **37** to roller **39**.

When the envelope is being shifted forward on the conveyor C, ball bearings **52** inserted in an elongated carrier **53** ride on top of the envelope for maintaining such in contact with the conveyor belts **36**. There are two laterally disposed carriers **53** which are in turn, secured by screws **54** to a horizontal brace **55** having downwardly turned flanges **56** adjacent its outer ends for securing such to the side walls **10** and **11**, respectively. A horizontal metal plate **57** is carried between rollers **29** and **37** directly below the conveyor belt **36** for partially supporting the belt. The metal plate **57** is mounted on the side plates **50** and **51**, respectively. Another smaller metal plate **58** is carried between the rollers **37** and **39**, and forms a portion of the printing bed upon which the platen K is supported. The metal plate **58** is also carried between the side plates **50** and **51**, respectively. It is noted that the metal plate **58** is recessed sufficiently so that when the platen K is mounted thereon, the top of the platen K is level with the tapes carried by the conveyors.

A reciprocating stop guide D is provided for arresting the movement of the envelope adjacent one end of the conveyor for positioning the envelope on the platen K so that the printing operation can take place. The stop guide includes a pair of laterally spaced vertical arms **59**; the free-ends of which extend above the surface of the platen K for engaging the front edge of the envelope being carried on the conveyor and arresting such directly under the printing head E. The other end of the vertical arms **59** are secured to a shaft **60** which is journaled between the side plates **50** and **51**, respectively. Thus, when the shaft **60** is rotated approximately 45 degrees in a counterclockwise direction the vertical arm **59** is shifted to the dotted line position (FIGURE 5) out of the path of the envelope and the rollers **39** and **49** eject the envelope into the receiving hopper F. The manner in which the shaft **60** is rotated will be discussed more fully below in connection with the drive linkage.

A printing head E reciprocates in a substantially vertical path for printing indicia on envelopes and the like, when they are in the arrested position. The printing head E is cylindrical in shape and has a flat area adjacent the bottom in which the chase H is carried and a flat portion adjacent the front thereof. The printing head E is bolted to an angle-iron **61** by means of bolts **62** and the flat front portion is flush against the vertical portion of the angle-iron. The printing head in the embodiment illustrated is constructed of aluminum and has longitudinal bores **63** drilled therein, so as to decrease the weight of such.

A receiving hopper F is carried on the side walls **10** and **11**, respectively, for receiving envelopes being ejected by the delivery rollers **39** and **49**, respectively. The receiving hopper has a vertical side wall **64** being joined by a bottom **66**. A pair of guiding vertical arms **67** having their lower ends joined to the bottom **66** of the hopper extend upwardly adjacent the top of the hopper for directing the envelopes into the hopper when such strikes an inwardly inclined portion **68** adjacent the upper ends thereof. The side of the hopper F opposite the side wall **64** is open for removing the printed envelopes **17** while in operation.

All of the moving parts of the printing press are driven off a main drive shaft G, which is journaled between the side walls **10** and **11**. The shaft is rotated by an electric motor **69** mounted on the base plate **13**. A belt **70** couples the drive shaft of the electric motor to a fly wheel **71** fixed to the drive shaft G for rotating such. An eccentric cam **72** is fixed to the drive shaft G and has a groove on its perimeter in which a bearing wheel **73** rides. The bearing wheel **73** is journaled on the end of a pivotal linking arm **74** which pivots about a shaft **75** suitably mounted between the side members **10** and **11**, respectively. The upper-end of the linking arm **74** is coupled to the reduced portion **32** of the feeder blade by an adjustable linkage **76**. The connections made by the ends of the adjustable linkage to the reduced portion of the block **32** and the linking arm **74** are pivotal connections. Thus, as the drive shaft G is rotating the bearing wheel rides on the eccentric cam **72** and moves to the dotted line position shown in FIGURE 3, and then back causing the linking arm to pivot about shaft **75**. As the linking arm is reciprocated in a counterclockwise and clockwise direction the feeder blade is also reciprocated. Thus, on each revolution of the shaft G the feeder blade B is moved forward to engage the flap **22** of the bottom envelope **17** inserting such between the feed rollers **28** and **29**, and is then returned to its initial rearward position. A pair of springs **77** and **78**, respectively, maintain the bearing wheel **73** in engagement with the eccentric cam **72**. Spring **77** is connected between an upper-end of the linking arm **74** and an angle-iron **79** carried between the side walls **10** and **11**, respectively. Spring **78** is connected between the lower-end of the linking arm **74** and one of the cross-braces **12**.

When the upper-end of the linking arm **74** moves forward a spring-biased plunger **80** suitably mounted thereon engages a pivotally mounted linking arm **81** causing such to rotate in a clockwise direction from the full line position illustrated in FIGURE 5 to the dotted line position. The linking arm **81** is journaled on a shaft **82** and has a stud **83** attached adjacent the top thereof. An intermediate linking arm **84** has one end pivotally secured to the stud **83** and the other end pivotally secured to a stud **85** carried adjacent the lower-end of a linking block **86**. The linking block **86** is, in turn, attached to the shaft **60** so that as the pivotally mounted linking arm **81** is shifted from the full line position to the dotted line position the linking block **86** causes the shaft **60** to rotate approximately 45 degrees in the counterclockwise direction. Such causes the vertical arms **59** which forms a portion of the stop guide D to pivot rearwardly.

As previously mentioned, when the vertical arms **59** are allowed to pivot rearwardly, the envelope being printed is ejected by the rollers **49** and **39** into the receiving hopper F. A spring **87** is connected between a fixed portion of the frame **88** and the stud **83** for returning the stop guide and the linkage to the position shown in full lines in FIGURE 5. Thus, if the conveyor conveys an envelope under the printing head when the stop guide D is in the position shown in FIGURE 5 the vertical arm engages

the edge of the envelope and arrests such directly under the printing head E.

The main drive roller **29** of the conveyor C from which all of the rollers are driven is driven off of the drive shaft G by means of a belt **29***a* which rides on a pulley **89** carried on the drive shaft G. A spring-biased tensioning pulley **90** also engages the belt **29***a* for maintaining the proper tension therein. The pulley **90** is a conventional item and is shown in broken lines in FIGURE 1.

As previously mentioned, the printing head E is mounted on an angle-iron **61** which is, in turn, attached between the upper-ends of a pair of vertically reciprocating rods **91** and **91***a*, respectively. Each of the rods **91** and **91***a* are freely carried within a pair of bearing posts **92** and **93**, respectively, mounted on the side walls **10** and **11** so that the rods can reciprocate in a vertical direction. Pivotally attached adjacent the bottom portion of the rod **91** is a linking arm **94** which, in turn, has its free-end pivotally attached to a rotating arm **95**. The rotating arm **95** has its free-end fixed to the shaft G so that as the shaft G rotates such in turn causes the rod **91** to reciprocate in a vertical manner to carry out the printing operation. Thus, it can be seen that all of the moving parts of the press are synchronized since they are driven off the single rotating shaft G.

The printing head E (FIGURE 5) has a recess **96** in the bottom thereof for receiving the chase H. The chase has a pair of side walls **97** and **98**, respectively, being joined by a pair of end walls **99** and **100**, respectively, defining an opening therebetween. A tapering protrusion **101** extends outwardly from the side wall **97** and fits within a complementary recess in the printing head for aiding in holding the chase H within the printing head E. An elongated rectangular protrusion **102** extends outwardly from the side wall **98** and fits within a complementary rectangular recess within the printing head for aiding in holding the chase H therein. The protrusions **101** and **102** extending within the recesses in the head E prevent the chase H from moving in a vertical direction during the printing operation. The end wall **99** is integral with the side walls **97** and **98**, and the end wall **100** is removably secured to the side walls by means of screws **103** which extend through the end wall **100** into the side walls **97** and **98**. In order to place Linotype slugs and spaces within the chase the side wall **100** is removed. Flanges **104** and **105** extend inwardly from the end walls **99** and **100**, respectively, for accommodating the Linotype slugs I and the spaces carried therein. The Linotype slugs I have a top, bottom, and ends with type **106** carried on the bottom of the slugs projecting therefrom. A slot **107** is cut in each end of the slugs I and are substantially the same width of flanges **104** and **105** in the chase H for providing a snug fit when the slugs I are inserted on the flanges of the chase H. The slots **107** are cut into the slug with a conventional printers saw, and are two picas from the bottom of the slug providing a rigid portion above and below the slot **107** for retaining the slugs in the chase. The spacing slugs carried between the Linotype slugs I are of the same dimension as the Linotype slugs with the exception that they have no type on the bottom thereof, however, they have similar slots cut therein for retaining such within the chase. Since the slugs are locked within the chase by means of the flanges **104** and **105**, respectively, and the slots **107**, it is impossible for the slugs or spaces carried therebetween to work-up during the printing operation. It is important that a rigid connection between the slugs and the chase be made since the printing head is reciprocating at a relatively high rate of speed, and if there were any play they would tend to work-up.

A chase spring-loaded locking screw **110** is mounted on the angle-iron **61** and the end of the screw extends through an opening in the side wall of the printing head to engage an indention carried in the rectangular protrusion **102** of the chase for locking the chase within the printing head. In order to remove the chase from the printing head the locking screw **110** is pulled out.

An inking roll assembly J is provided for alternately rotating in a clockwise and counterclockwise direction so as to distribute ink being supplied from an ink fountain **111** over the surface of the printing head E and onto the type **106** carried on the slugs I, within the chase H. The inking roller assembly J is driven off of an inking roller drive shaft **112** journaled on bearings **112***a* carried within the printing head E. A pinion gear **113** is carried adjacent one end of the inking roll drive shaft **112** in fixed relation therewith. The pinion gear **113** is in meshed relation with the teeth of a stationary gear track **114** so that as the printing head is reciprocated in a vertical direction during the printing operation the engagement between the pinion gear **113** and the stationary gear track **114** causes the inking roll drive shaft **112** to alternately reciprocate in a clockwise and counterclockwise direction. The gear track **114** is mounted in a fixed relation by any suitable means to the side wall **10**. A pair of opposed spaced arms **115** and **116** have one of their ends fixed to the inking roll drive shaft **112** and the other ends extend beyond the periphery of the printing head E. Positioned between the outer-ends of the opposed arms **115** and **116** are a pair of spaced rectangular supporting plates **117** and **118**, respectively, in which a pair of inking rollers **119** and **120** are journaled within ball bearings (not shown). Each of the supporting plates **117** and **118** has a supporting pin **121** extending outwardly therefrom. A longitudinal slot **122** is disposed within the outer ends of the arms **115** and **116**. An elongated cylindrical slug **123** is slidably carried within each of the longitudinal slots **122**. A spring **124** is connected to the inner-end of each of the slugs **123** biasing them inwardly. The other end of the spring **124** is secured to a pin **125** carried within the arms **115** and **116**. A lateral slot **126** having closed ends extends through each of the arms **115** and **116** and intersects the longitudinal slot **122**. The supporting pins **121** extend through the lateral slot **126** and a small opening in the slug **123** so that the closed end **126***a* of the lateral slot **126** defines the movement of the inking rollers **119** and **120** during the printing operation. The outer closed end **126***a* prevents the rollers from moving beyond that point when such is being reciprocated.

A ready-made platen K (FIGURES 5, 6 and 7) is carried in a recess in the printing bed and is supported on the flat metal plate **58**. The platen K is secured to the plate **58** by a single screw **127** so that such can be readily changed and another platen from a suitable library can be substituted therefor. The platen K includes an elongated wooden member **128** having one edge of a tympan **129** secured to the edge of such by means of a screw **130**. The tympan **129** is stretched over the upper surface of the wooden member **128** and strips of paper **131** or the like, and secured in a groove **132** in the other side by means of an inverted L-shaped member **133** locking the tympan within the groove. The vertical portion of the L-shaped member **133** is secured to the side wall by means of a screw **134**.

In order to obtain a high quality of print the platen K should be built-up with strips of paper, such as illustrated at **131**, so that the thickness of the platen is the complement of the thickness of the envelope at any given point. For example, if the thickness of the envelope at a particular point is four sheets, then the thickness of the platen at that point may be zero sheets, whereas, at another point if the thickness of the envelope is three sheets of paper, then the thickness of the platen directly under that point would be one sheet in order to balance out the entire surface under the printing head.

The inking roller **119** receives ink from the ink fountain **111**. The ink fountain **111** is a conventional ink fountain which may be operated in any suitable manner from the printing press. The ink fountain is illustrated in schematic form, and includes an inking roller **135**

which is rotated by a conventional rachet wheel not disclosed. The ink feeding blade **136** is adjusted by means of the adjusting screw **137**. By rotating the screw **137** such causes the bottom edge of the feeder blade **136** to be displaced from the inking roller **135** to control the amount of ink being deposited on the roller. As the roller is rotated, such conveys the ink to the inking roller **119** of the inking roller assembly J when they are brought in contact.

In operation, the envelopes are loaded into the hopper A and the bottom envelope is carried on the feeder blade **27**. When the feeder blade **27** is moved forward as the main drive shaft G is rotated, such engages the flap **22** of the bottom envelope pushing such between the drive rolls **28** and **29** of the conveyor C. The envelope is transported by the belts **36** of the conveyor until such strikes the stop guide D. The envelope is positioned directly under the printing head by the vertical arms **59**. The printing head E is then moved downwardly into engagement with the envelope printing the heading on such. As the printing head E is raised the vertical arm **59** of the stop guide D is pivoted rearwardly and the roller **37** pushes the envelope into the rollers **39** and **49**. Rollers **39** and **49** eject the envelope into the receiving hopper F. It is noted that as the printing head E is moved up and down the pinion **113** engages the fixed gear track **114**, causing the inking roller assembly to alternately reciprocate in a clockwise and counterclockwise direction. As the inking roller reciprocates on the printing head E it distributes ink from the ink well **111** onto the type carried in the chase H.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit and scope of the following claims:

What is claimed is:

1. In a printing press for printing headings and the like on items such as envelopes comprising: a frame for the press, a feed hopper for carrying a stack of envelopes having their flaps facing downwardly, said hopper having an elongated opening adjacent the front bottom portion thereof and a slot in the bottom thereof permitting the flap of said bottom envelope of said stack to extend therein, a reciprocating feeder blade carried adjacent the bottom of said hopper, an envelope conveyor positioned adjacent the front of said hopper, means for continuously rotating said conveyor, said conveyor comprising, a pair of feed rollers, continuously driven belts, and a delivery drive roller, means for propelling said feeder blade forward for engaging said flap of said bottom envelope moving said envelope between said feed rollers and onto said belts, a reciprocating stop guide arresting the movement of said envelope adjacent one end of said belts for positioning said envelope for printing, a printing head, means for supporting said printing head on said frame, means for reciprocating said printing head in a substantially verticle path for printing indicia on said envelope when in said arrested position, means for supporting said envelope during printing, said means comprising a platen supported between said rollers and carried by the frame, a receiving hopper carried adjacent the end of said conveyor for receiving said printed envelopes, and means for moving said stop guide out of the path of said envelope following printing allowing said delivery drive roller to eject said printed envelope from said arrested position to said receiving hopper.

2. The printing press as set forth in claim **1** further comprising a rotating drive shaft; linkage means coupling said feeder blade, said stop guide, and said printing head to said drive shaft for synchronizing the movement of such relative to each other.

3. In a printing press for printing headings and the like on items such as envelopes comprising: a frame for the press, a feed hopper for carrying a stack of envelopes having their flaps facing downwardly; said hopper having an elongated opening adjacent the front bottom portion thereof and a slot in the bottom thereof permitting the flap of said bottom envelope of said stack to extend therein; a reciprocating feeder blade carried adjacent the bottom of said hopper; an envelope conveyor positioned adjacent the front of said hopper, means for continuously rotating said conveyor, said conveyor comprising a pair of feed rollers and continuously driven belts, said feed rollers being positioned adjacent the leading edge of said belts; means for propelling said blade forward for engaging said flap of said envelope moving said envelope between said feed rollers which deliver said envelope onto said belts; means for arresting the movement of said envelope adjacent one end of said belts for positioning said envelope for printing; a printing head, means for supporting said printing head on said frame, means for reciprocating said printing head in a substantially vertical path for printing indicia on said envelope when in said arrested position; means for supporting said envelope during printing, said last mentioned means comprising a platen carried by said frame and supported adjacent said belts for supporting said envelope when the printing head engages said envelope during printing; whereby said envelope travels in a straight path from said hopper under said printing head.

4. The printing press as set forth in claim **3** further comprising a rotating drive shaft; linkage means coupling said feeder blade, said stop guide and said printing head to said drive shaft for synchronizing the movement of such relative to each other.

5. The printing press as set forth in claim **4** wherein said hopper has a vertical portion terminating in a forwardly inclined portion; said envelopes carried in said vertical portion resting on the trailing edge of said bottom envelope in said inclined portion and said inclined portion permitting a large stack of envelopes to be carried in the hopper while permitting the bottom envelope to be easily removed therefrom.

6. The printing press as set forth in claim **4** wherein a recessed supporting member is carried below said printing head; a ready-made removable platen carried on said recessed supporting member; an upper surface of said platen being level with said conveyor for receiving envelopes therefrom and supporting said envelopes during the printing operation.

References Cited

UNITED STATES PATENTS

1,110,723	9/1914	Spiess	101—320
1,405,515	2/1922	Hughes	101—320
1,717,231	6/1929	Krell	101—287
1,879,964	9/1932	Whitlock	101—287
2,133,261	10/1938	Wolff	101—47 X
2,258,880	10/1941	Bobst	101—287 X
2,521,237	9/1950	Marvin	101—232
2,554,577	5/1951	Lauffer	101—232 X
2,615,392	10/1952	Sauermary	101—473
2,680,614	6/1954	Gibsory	271—44
3,010,716	11/1961	Hirst et al.	271—44
3,383,106	5/1968	Brown	271—44

WILLIAM B. PENN, Primary Examiner

U.S. Cl. X.R.

101—232, 316