Feb. 20, 1940. J. R. SWIFT ET AL 2,190,740

HAND OPERATED PRINTING PRESS

Filed Dec. 1, 1938 2 Sheets-Sheet 1

Fig. 1.

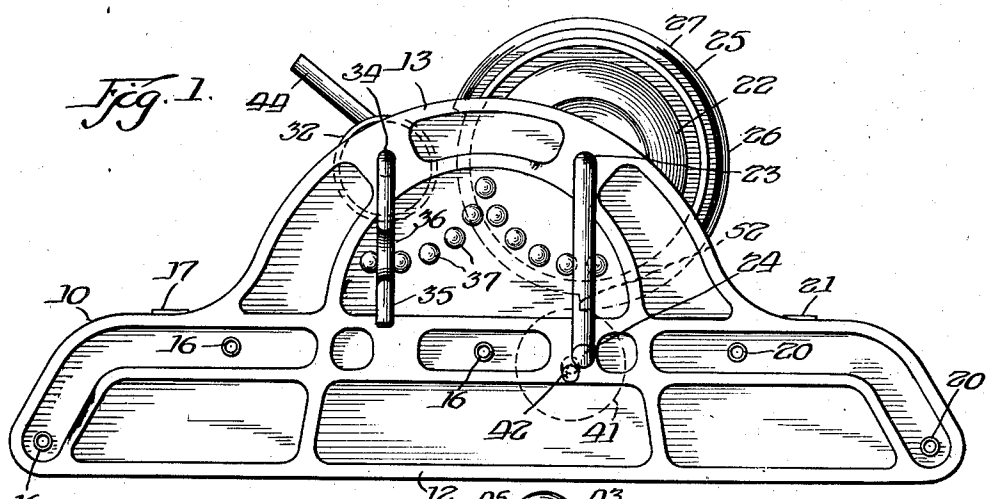


Fig. 2.

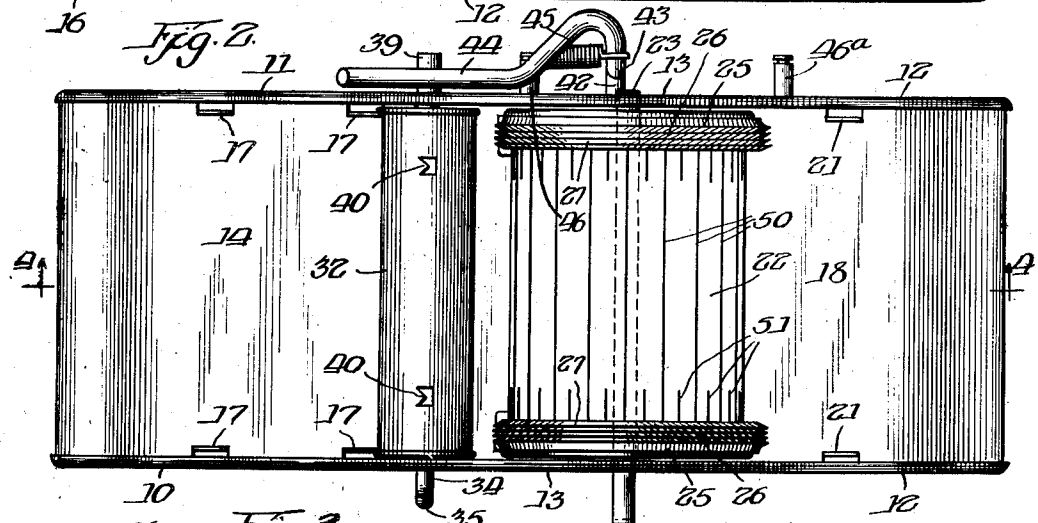


Fig. 3.

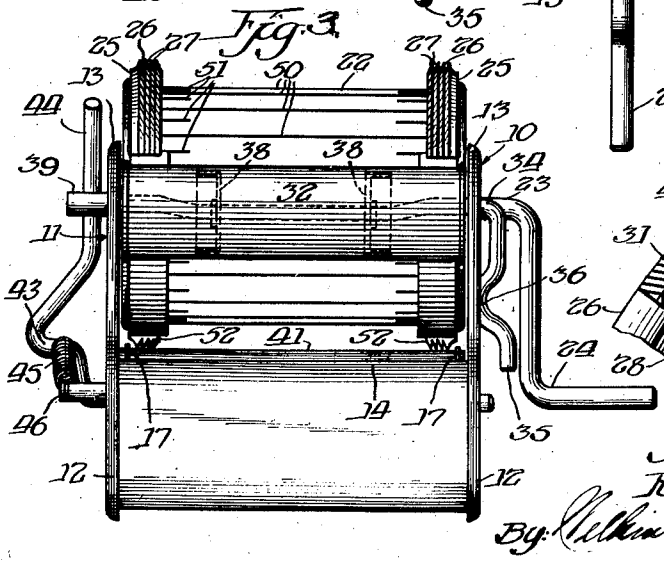
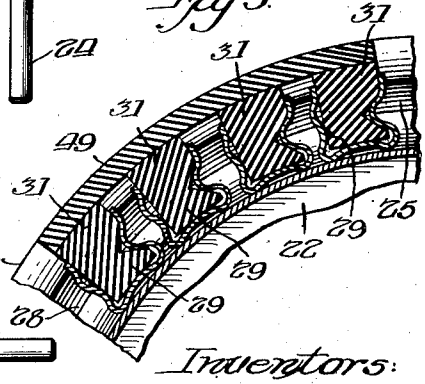


Fig 9.



Inventors:
Justin R. Swift &
Roy W. Redin.
By: Atkinson Huxley Byron & Knight
Attys.

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Fig. 4.

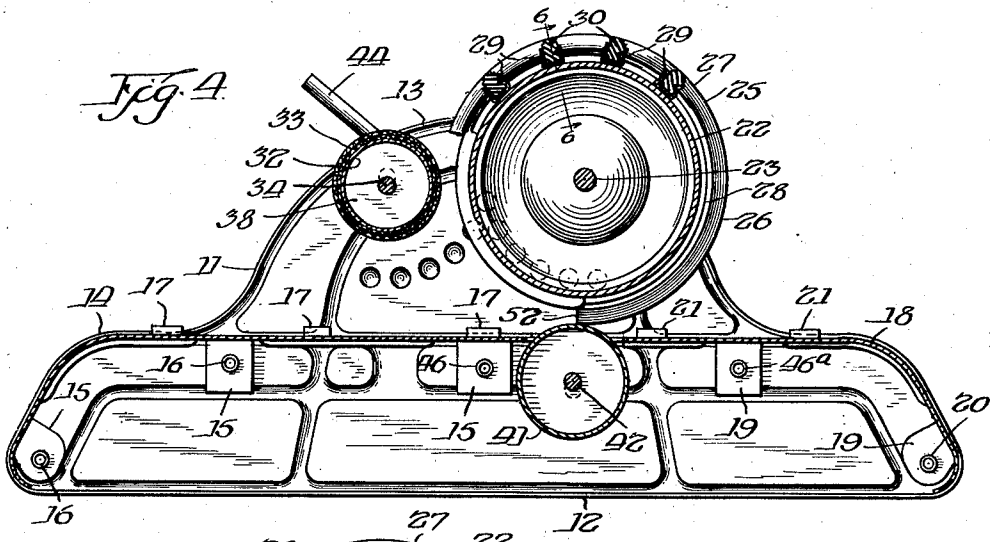


Fig. 5.

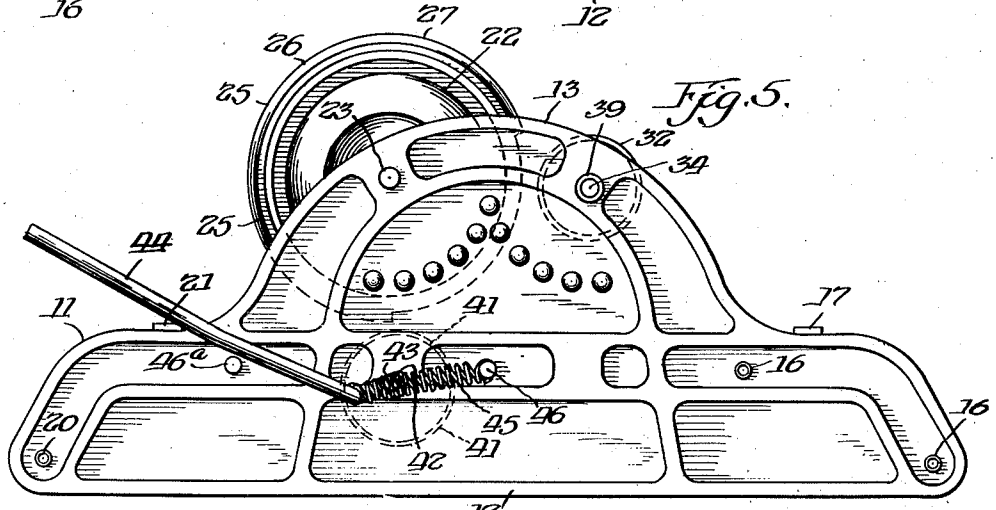


Fig. 6.

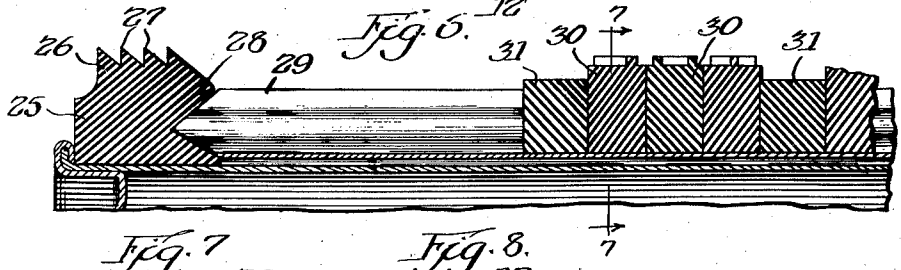


Fig. 7.

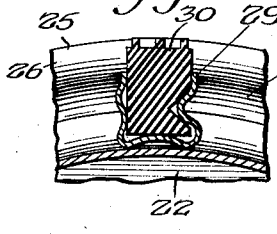
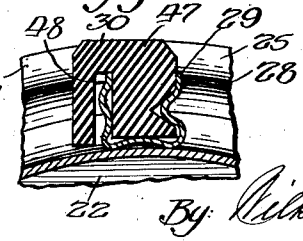


Fig. 8.



Inventors:
Justin R. Swift &
Roy W. Redin:

By: Wilkinson Huxley Byron & Knight
Attys.

Patented Feb. 20, 1940

2,190,740

UNITED STATES PATENT OFFICE

2,190,740

HAND OPERATED PRINTING PRESS

Justin R. Swift and Roy W. Redin, Chicago, Ill.

Application December 1, 1938, Serial No. 243,312

8 Claims. (Cl. 101—216)

Our invention relates to a hand operated printing press of the cylinder type. It is designed primarily for juvenile use as a toy, in homes, playrooms, and the like, but may be used by schools, organizations and other places where short notices are to be printed.

Another object of our invention is the provision of a hand operated printing press which is extremely simple in construction, easy and simple to operate, and so designed that various setups of type can be employed and miscellaneous and sundry compositions printed. The press can be manufactured and sold very cheaply to meet the demand of users in small places such as restaurants for printing menus, schools for printing announcements, and in various combinations of work for small organizations, as well as a toy which is both educational and instructive in the art of printing.

Another and further object of our invention is the provision of a printing press in which type bars are removably secured to the cylinder so that type may be set up in the type bars and type having various sizes of printing face used, or rubber dies having illustrations appearing thereon may be used, as may be desired, so that attractive effects can be produced by proper sizes of type and the spacing and arrangement of the bars and the like in connection with the operation of the press.

Another and further object of our invention is a press in which paper and other material of varying thickness can be used, the press working equally well with thin tissue as well as heavy cardboard.

Another and further object is a simple printing press in which color runs may be made either by changing the ink pad on the inking roller or by removing the inking roller and substituting a new roller therefor carrying a different color inking pad.

Another and further object of the invention is the provision of a press having a cylinder calibrated so that the makeup can be laid out to scale and the material planned in various attractive setups, or almost any kind of a setup may be used as the device prints a line at a time, so that the device presents almost limitless possibilities in use.

Another and further object of our invention is the provision of a small hand operated press which is effective and simple in operation, which is accurate, and in which varied compositions may be used if desired, and which has a simple and practical paper feed so that the printing thereon is accomplished in an attractive and desirable manner and the paper smoothed out and held in a taut and smooth position while it is being fed through the press.

These and other objects of our invention will be more fully and better understood by reference to the accompanying sheets of drawings, and in which—

Figure 1 is a side elevational view of our improved press;

Figure 2 is a top plan view of the press shown in Figure 1;

Figure 3 is an end elevational view of the press;

Figure 4 is a longitudinal sectional view taken on line 4—4 of Figure 2;

Figure 5 is a side elevational view of the press of the side opposite that shown in Figure 1;

Figure 6 is a fragmentary sectional view on line 6—6 of Figure 4;

Figure 7 is a transverse sectional view on line 7—7 of Figure 6;

Figure 8 is a sectional view showing a modified form of type with wide face; and

Figure 9 is a sectional view showing the use of a mat such as rubber or the like, carrying pictures or other insignia, secured to the faces of slugs which may be used, if desired.

Referring now specifically to the drawings, and in which like reference characters refer to like parts throughout, side members 10 and 11 are provided which form the main portion of the frame for the press. Each of these side members has a base portion 12 which rests upon a table or any other level place to support the press, and upwardly extending, integrally formed extensions 13, 13 upon which some of the operating parts of the press are mounted. A front plate 14 is provided which has ears 15, 15 thereon on each side through which hollow rivets 16, 16 are inserted which pass through the side members 10 and 11, respectively, with struckout upstanding portions 17, 17 at each side thereof on the upper face which form guides for the paper as it passes into the printing press, as hereinafter described.

A rear plate 18 is provided which has ears 19, 19 at each side thereof and through which hollow rivets 20, 20 pass, which also pass through each of the side frames 10 and 11, providing the frame at the rear portion thereof with supporting means for the paper, and also serving with the side members 10 and 11 and the front plate 14 to form a complete supporting frame for the press. It will be noted that the front plate 14 and the rear plate 18 are curved downward to conform to the contour of the ends of each of the side

members 10 and 11 and thus provide a neat appearing and suitable bed upon which the paper is received for printing and upon which the paper is received after it passes through the printing press. The rear plate 18 has struckup portions 21, 21 which serve as side guides for the paper after it passes through the press and while the printing operation is being performed thereon, in order to hold it in proper alignment with the printing press.

A printing cylinder 22 is provided, mounted upon an axle 23 which extends through and is mounted in the side frame members 10 and 11 and which is bent at one end into a crank portion 24 to be grasped by the operator in order to rotate the cylinder. The cylinder is mounted in fixed relation upon the axle 23 so that as the axle 23 is rotated the cylinder also is turned. Mounted on the cylinder 22 at each end thereof are tires 25, 25 preferably made of rubber or of other similar substance, which are held onto the cylinder by their elasticity and because of their shape and form perform five functions: First, means for holding the type bars in position upon the cylinder; second, frictional means for causing the rotation of the ink roller and impression roller; third, the spreading and holding of the paper as it passes between the cylinder and the pressure roller so that it is held in smooth position while being printed; fourth, the tires are so constructed that movement of the cylinder is conveyed to the ink roller and impression roller and they are rotated only during the printing operation; and fifth, the tires have tread portions thereon the ends of which form stops for the paper placed in the press so that printing is properly placed on the paper.

The tires 25, 25 have treads 26, 26 thereon which extend substantially three-quarters of the way around the tires and terminate abruptly forming shoulder portions at each end of the tread portions, one set of which forms a stop for the paper inserted in the press at the beginning of the printing operation. The outer peripheries of these treads 26 have ribs 27, 27 thereon extending circumferentially thereof, these ribs being formed with vertical faces on their outer sides and inclined faces on their inner sides extending outward to their edges which engage the paper as it passes beneath the printing cylinder when this cylinder is rotated and exert a lateral pull on the paper so as to hold it flat and taut during the printing operation, thereby preventing wrinkling of the paper and holding it in smooth position while the printing operation is being performed. As the edges of the ribs are compressed, there is a slight movement outward until the vertical faces of the ribs appear undercut. This movement is due to the long angle of the faces of the ribs on the inner sides and the vertical faces on the outer sides. The tread portions 26 also perform the function of contacting the inking roller and the pressure roller through the paper, hereinafter described, in driving them during the printing operation.

The tires 25, 25 also have V-shaped grooves 28, 28 in their sides oppositely disposed and inwardly opening and extending partially thereabout, within which the ends of U-shaped type slots 29, 29 are adapted to be received and held during the printing operation. These type slots 29, 29 have type such as 30, 30, with quads 31, 31 being provided to hold the type mounted therein, the type and quads being made preferably of rubber or the like, and of the character and kind described and claimed in Patent No. 2,041,499 of May 19, 1936. The ends of the U-shaped type slots 29, 29 are V-shaped to correspond to the contour of the grooves 28, 28 in the sides of the tires, with the type slots being of sufficient length to fit snugly in the tires and about the periphery of the cylinder 22. These type slots 29, 29 are placed in position on the cylinder by simply flexing the tires toward the outer ends of the cylinder and inserting the slots in the grooves 28, 28 in the sides of the tires, so that they are held in printing position upon the cylinder 22 and may be easily and quickly removed in the same manner.

An inking roller 32 is provided having the usual fabric or ink retaining member 33 thereon of substantially the same width as the length of the cylinder between the tires. The inking roller 32 is mounted on a bell crank axle 34 in the side members 10 and 11, respectively, and terminating in a crank portion 35 having an inturned portion 36 adapted to be received and held between struckup portions 37, 37 in the frame member 10. The inking roller 32 has a pair of drums 38, 38 on the crank portion of the axle 34 so that as the axle 34 is rotated the roller 32 is moved toward or away from the cylinder 22 and held in frictional engagement with the tread portions 26 of the tires so that as the cylinder 22 is rotated the ink roller 32 is rotated at the same peripheral travel, thereby inking the faces of the type which are of a proper height to press firmly against the inking member 33 and receive a supply of ink therefrom and without smearing the face of the type.

The proper positioning of the inturned portion 36 between the struckup portion 37 of the frame holds the ink roller 32 in proper adjusted position both with respect to engagement with the tread portions 26 of the tires and also to engage the type 30. The free end of the bell crank axle 34 has a rubber sleeve 39 fitted thereover to hold it in position, the sleeve member being fitted tightly over the end and frictionally engaging the end of the axle member 34 to hold it in position in the frame to prevent slipping of this member out of the frame, and also for a cushioning member for the operating lever for the impression roller, as hereinafter described, and also for the purpose of removing the ink roller to substitute a roll with a different color ink retaining member. The ink roller has struckout portions 40, 40 pointed at their ends and on to which one end of a strip of suitable ink absorbing fabric is secured and thereafter wrapped onto the ink roller 32 so that a plurality of layers of material are provided to form the ink carrying and retaining member 33. This member is easily removed from the roller 32 if desired for purposes of cleaning or supplying a different color ink, or the entire roller can be removed by taking the rubber sleeve 39 off the end of the axle 34 and drawing this member free of the frame and the entire roller 32 removed from the axle and a new or different roller placed on the axle 34.

A pressure roller 41 is mounted upon a crank axle 42 which has a right angle crank portion 43 at one end thereof and terminates in a handle portion 44 which normally in printing position of the pressure roller extends upwardly in a vertical direction alongside of the side member 11 and rests against the sleeve 39 on the free end of the axle 34, being held in this position by a spring 45, one end of which is secured to the crank portion 43 of the axle 42 and the other end anchored

to a pin 46 mounted in the side frame member 11. The spring 45 is under tension in two positions, one as described when the pressure roller is in operative position with respect to the cylinder as shown in Figure 2, and in inoperative position with the pressure roller 41 lowered as shown in Figure 5, and out of engagement with the cylinder 22. When the lever 44 is turned to inoperative position the crank portion is beyond the center of the axle 42, the handle rests upon a stud 46a in the side member 11 and the lever is held in this position by a spring 45. The eccentric portion of the axle 42 provides means whereby the pressure roller 41 may rotate freely and at the same time provides means for the automatic operation of the press with respect to thickness of paper, from thin sheets to cardboard, with the printing pressure kept constant throughout this range of thickness. As shown in Figure 3, the tires are spaced upward from the table a sufficient distance to allow for the insertion of any paper, however thick, and a constant uniform pressure is maintained by the spring 45 on the paper during the printing operation, regardless of its thickness. As the press is rotated for the purpose of inking the type, the pressure roller is lowered so it is clear of the type so as to prevent inking the roller when paper is not fed through the press.

In operation of the device type and type slots 29 of the form shown in Patent No. 2,041,499 are used, with the exception that the type slots are pointed at each of their ends to fit into position in the grooves 28 of the tires 25, as heretofore described, around the periphery of the printing cylinder 22. In addition to the kind of type shown and described in the above named patent, type 47 may be used having a slot 48 therein extending upward from the base thereof, with one side of the type slots extending into the slot 48 as shown. This type provides a larger printing face and may be provided with larger letters, characters or the like, as may be desired. Also a plurality of quads, such as 21, may be provided having a face 49 cemented or otherwise secured thereto, on which may be a pictorial illustration, a comic character, or any other attention directing or arresting illustration, which may be fitted into the combination to make the printing more attractive or desirable.

The cylinder 22 is calibrated with lines 50, 50 extending the length of the cylinder and other lines 51, 51 of lesser length placed midway between the lines 50, 50, the spacing of the lines 50, 50 being such that when translated to the printed sheet they represent one-half inch and the shorter lines 51, 51 represent one-quarter inch. This provides an accurate means of scaling the layout for the printed material. The type bars may be placed in slightly angular position on the face of the cylinder to form lines of printing appearing diagonally on the printed page for attention directing or grotesque presentation if desired.

The inking roller 32 has had the ink carrying material applied thereto, with a suitable quantity and color of ink, and the crank portion 35 of the ink roller 32 is set so that the tread portions 26 of the tires engage the periphery of the inking roller and the inking portion of the roller is in contact with the type. If desired, the cylinder may be rotated a few times in order to secure proper adjustment and to ink the type sufficiently. When the type has been properly inked and the adjustment of the inking roller made to cause it to function properly, the lever 44 is moved into the position shown in Figure 2 of the drawings, thus bringing the pressure roller 41 up in printing position as shown in Figure 3. The cylinder 22 is rotated to a point just short of where the tread portions of the tires are about to engage the inking roller, in which position the opposite ends 52, 52 of the tread portions of the tires are slightly behind and abut against the pressure roller 41 to form stops for the paper to be inserted in the press. In the normal operative position of the press only the tread portions of the tires engage the inking roller 32 and pressure roller 41. This abutting relationship of the tires against the pressure roller secures accurate registry of the paper in the press, and also enables accurate registry of the paper if it is desired to print in two or more colors by running the paper through the press after the inking roller has been changed and a different type set-up made.

The paper on which the printing is to be done is placed on the forward plate 14 and slipped under the printing cylinder. The operator then grasps the crank 24 and turns the cylinder in a counterclockwise direction. As the cylinder is rotated the tread portions of the tires engage first the inking roller and cause it to rotate, inking the type, and as it passes downward engages the paper over the pressure roller. At the same time the forward line of type comes in contact with the paper, the pressure roller 41 forming also an impression base for the type as it passes over the paper, so that as the cylinder is rotated the paper in effect is pulled between the roller 41, which thus acts both as a feed and a pressure roller. The printed paper is carried through over the rear plate 18 between the guides 21, 21 provided thereon, and ejected at the back side of the press. For other impressions the cycle of operation described above is repeated as often as may be desired, with, of course, the necessary quantity of ink being added to the inking roll as occasion may demand in order to secure proper legibility of the printing.

Both the type and the quads are preferably of rubber or some other resilient material similar thereto, and various kinds and sizes of type can be provided, with various miscellaneous characters, quads and the like, so that endless amounts and kinds of compositions can be set up and reproduced on the small press at a minimum of cost and exceedingly cheap in operation, both in the cost of the press and the materials used in its operation.

While we have described more or less precisely the details of construction, we do not wish to be understood as limiting ourselves thereto, as we contemplate changes in form and the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of our invention.

We claim:

1. A hand printing press comprising, in combination, a pair of side members, cross plates secured thereto forming a bed for the press, a cylinder rotatably mounted in said side members, an inking roller rotatably mounted in said side members and movable relative to said cylinder, and impression roller rotatably mounted in said frame and movable with respect to said cylinder, flexible tires on said cylinder having tread portions thereon, type guides on said cylinder held in position by the said tires, and type in said guides, the tread portion of the said tires

acting as frictional drive means for the inking roller and the impression roller.

2. A hand printing press comprising, in combination, a pair of side members, cross plates secured thereto forming a bed for the press, a cylinder rotatably mounted in said side members, an inking roller rotatably mounted in said side members and movable relative to said cylinder, an impression roller rotatably mounted in said frame and movable with respect to said cylinder, flexible tires on said cylinder having tread portions thereon, type guides on said cylinder held in position by the said tires, and type in said guides, the tread portion of the said tires acting as frictional drive means for the inking roller and the impression roller and for holding the paper in flat position on the bed of the press.

3. A hand printing press comprising, in combination, a pair of side members, cross plates secured thereto forming a bed for the press, a cylinder rotatably mounted in said side members, an inking roller rotatably mounted in said side members and movable relative to said cylinder, an impression roller rotatably mounted in said frame and movable with respect to said cylinder, flexible tires on said cylinder having tread portions thereon, type guides on said cylinder held in position by the said tires, and type in said guides, the tread portion of the said tires acting as frictional drive means for the inking roller and the impression roller and having offset ends whereby to act as paper stops for the positioning of the paper in the press.

4. A hand operated printing press comprising, in combination, a frame, a cylinder rotatably mounted in said frame, flexible tires on each end of the said cylinder having tread portions extending partially therearound, the tread portions having circumferentially extending ribs thereon with respect to said tread portions, the tires having oppositely disposed channels in the sides thereof, type guides on said cylinder having their ends mounted in the channels in the said tires, type in said guides, an inking roller movably and rotatably mounted with respect to the said cylinder, and an impression roller rotatably and movably mounted with respect to the said cylinder.

5. A hand operated printing press comprising, in combination, a frame, a cylinder rotatably mounted in the said frame, flexible tires on each end of the said cylinder having tread portions extending partially therearound, the tread portions having circumferentially extending ribs thereon with respect to said tread portions, the tires having oppositely disposed V-shaped channels in the sides thereof, type guides on said cylinder having V-shaped ends mounted in the channels in the said tires, type in said guides, an inking roller movably and rotatably mounted with respect to the said cylinder, and an impression roller rotatably and movably mounted with respect to the said cylinder.

6. A hand operated printing press comprising, in combination, a frame, a cylinder rotatably mounted in the said frame, flexible tires on each end of the said cylinder having tread portions extending partially therearound, the tread portions having circumferentially extending ribs thereon with respect to said tread portions, the tires having oppositely disposed channels in the sides thereof, type guides on said cylinder having their ends mounted in the channels in the said tires, type in said guides, an inking roller movably and rotatably mounted with respect to the said cylinder, and an impression roller rotatably and movably mounted with respect to the said cylinder, the said inking and impression rollars being intermittently operable by the tread portions of the said tires.

7. A hand operated printing press comprising, in combination, a frame, a cylinder rotatably mounted in the said frame, flexible tires on each end of the said cylinder having tread portions extending partially therearound, the tread portions having circumferentially extending and outwardly and oppositely disposed ribs thereon with respect to said tread portions, the tires having oppositely disposed channels in the sides thereof, type guides on said cylinder having their ends mounted in the channels in the said tires, type in said guides, an inking roller movably and rotatably mounted with respect to the said cylinder, and an impression roller rotatably and movably mounted with respect to the said cylinder, the said inking and impression rollers being intermittently operable by the tread portions of the said tires.

8. A hand operated printing press comprising, in combination, a frame, a cylinder rotatably mounted in the said frame, flexible tires on each end of the said cylinder having tread portions extending partially therearound, the tread portions having circumferentially extending ribs thereon with respect to said tread portions, the said ribs having vertical faces on their outer sides and diagonally extending faces on their opposite sides, the tires having oppositely disposed channels in the sides thereof, type guides on said cylinder having their ends mounted in the channels in the said tires, type in said guides, an inking roller movably and rotatably mounted with respect to the said cylinder, and an impression roller rotatably and movably mounted with respect to the said cylinder, the said inking and impression rollers being intermittently operable by the tread portions of the said tires.

JUSTIN R. SWIFT.
ROY W. REDIN.