B. F. UPHAM.

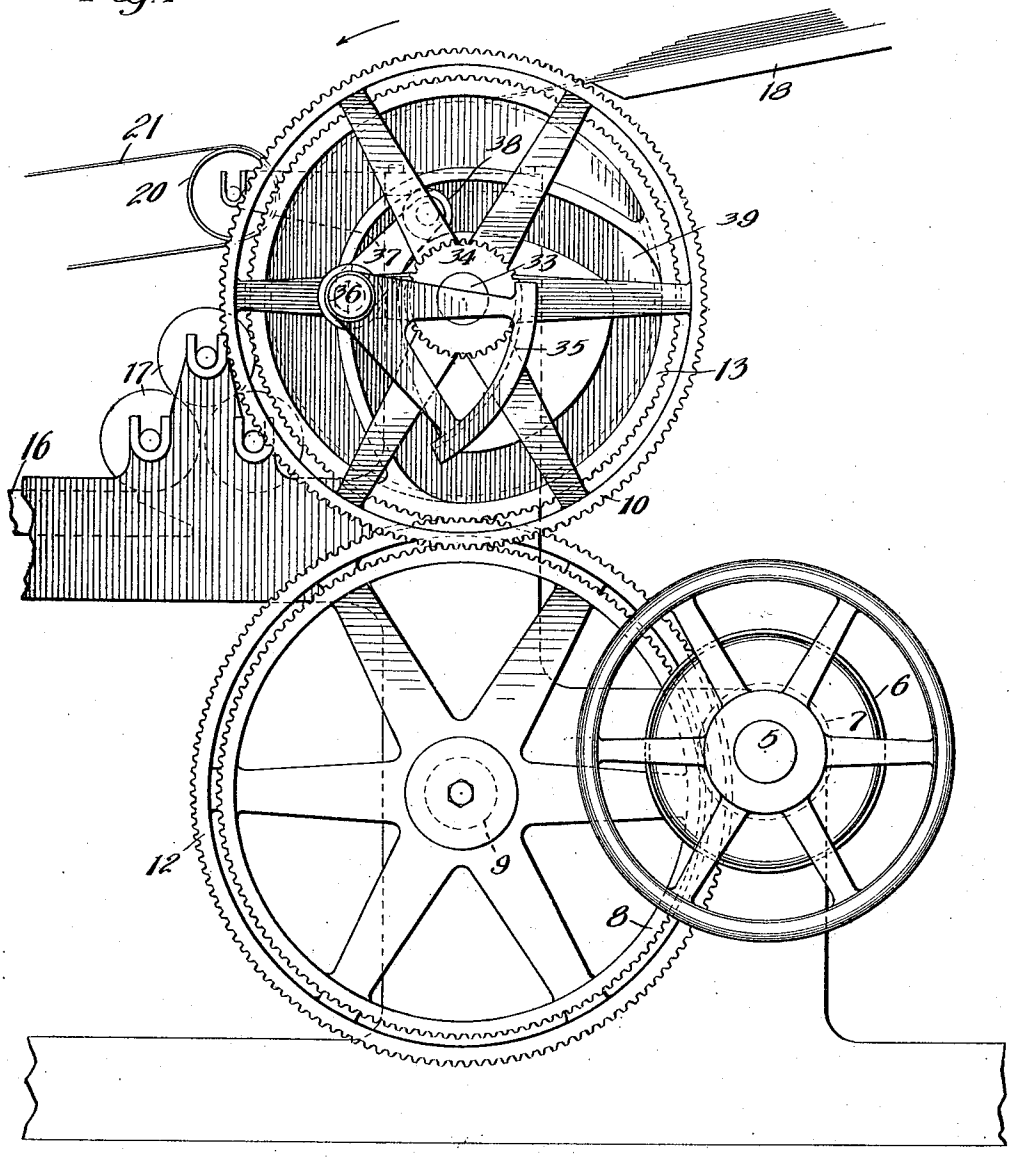
PRINTING PRESS.

APPLICATION FILED JUNE 30, 1911.

1,128,390. Patented Feb. 16, 1915.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:

Wm. Geiger

Esther Abrams

Inventor:

Burt F. Upham

By Munday Evarts Adcock & Clarke

His Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

B. F. UPHAM.

PRINTING PRESS.

APPLICATION FILED JUNE 30, 1911.

1,128,390.

Patented Feb. 16, 1915.

2 SHEETS—SHEET 2.

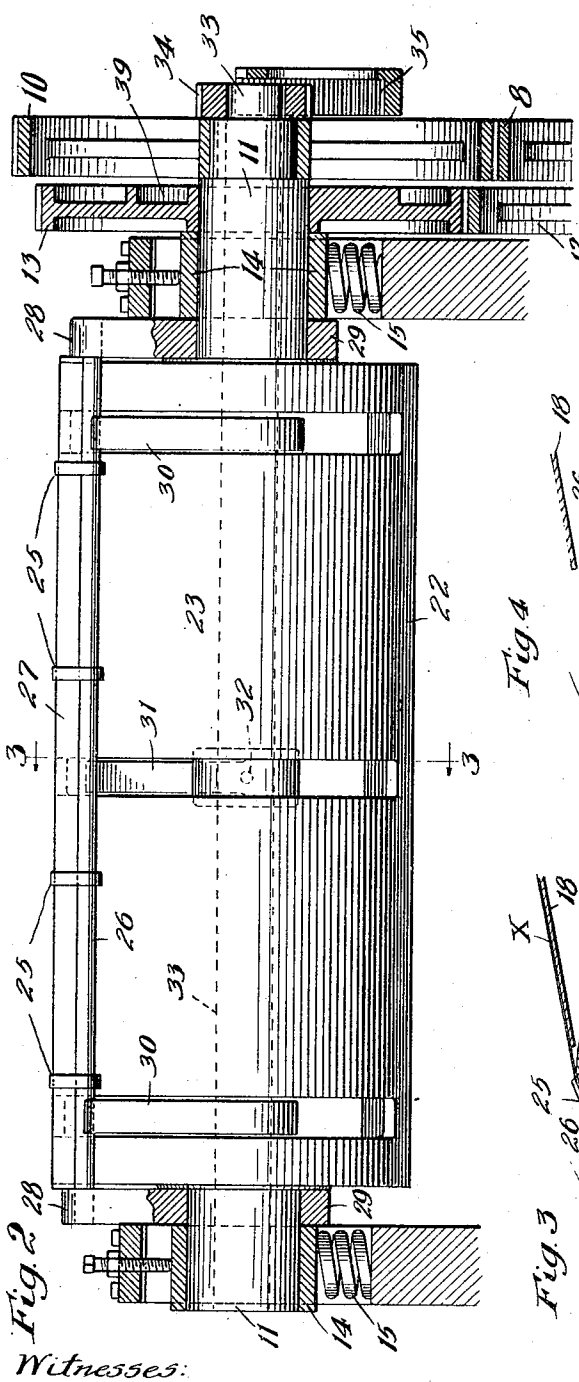


Fig. 2

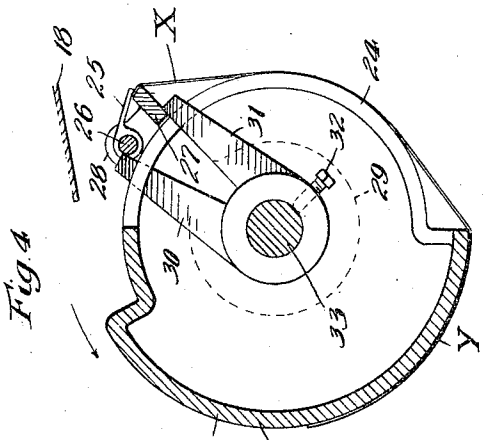


Fig. 4

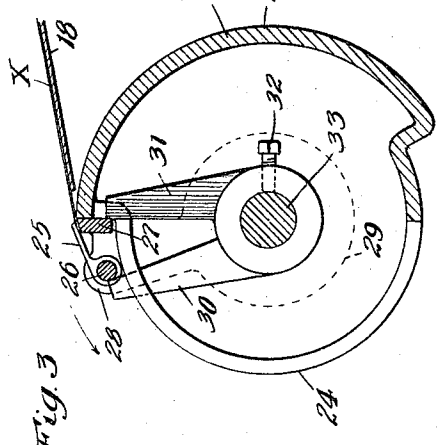


Fig. 3

Witnesses:

Wm. Geiger

Esther Abrams.

Inventor:

Burt F. Upham

By Munday Evarts Adcock & Clarke

his Attys

UNITED STATES PATENT OFFICE.

BURT F. UPHAM, OF CHICAGO, ILLINOIS.

PRINTING-PRESS.

1,128,390. Specification of Letters Patent. Patented Feb. 16, 1915.

Application filed June 30, 1911. Serial No. 636,205.

To all whom it may concern:

Be it known that I, BURT F. UPHAM, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Printing-Presses, of which the following is a specification.

This invention has for its object, an increase in the product of that class of printing press in which the paper is fed to the impression devices in the form of separated sheets. It has been devised more especially for use in what are commonly known as pony presses, though I do not wish to be limited to such presses nor to any particular size or construction of presses.

I have illustrated the invention in this application as applied to a two revolution press but it will be understood that the invention can be used in any other kind of press capable of making a plurality of impressions upon different parts of the sheet with only a single type form.

In this preferred form of the invention I provide the cylinder with grippers which after the making of one impression on the sheet will by an independent circumferential movement, shift the sheet around the cylinder so as to carry a fresh part thereof over the printing surface in readiness for a second impression. This second impression is then made during a succeeding revolution, so that the sheets when discharged each have two separate impressions instead of one, and are thus adapted to be severed and furnish twice the number of impressions which can be obtained from the press when used in the ordinary way.

The invention consists in the combination with the cylinder of grippers having a circumferential movement for shifting the sheet to present a fresh part thereof at the printing point for a second impression, and means for operating such grippers.

The invention further consists in the cylinder the grippers whereof are movable circumferentially around the cylinder thus adapting them to shift the sheet around the cylinder, in combination with a reciprocating type bed contacting with the cylinder at its different revolutions so that impressions may be made on different parts of the sheet, one before and the other after the shifting.

The invention further consists in the cylinder the grippers whereof are movable independently of the cylinder and circumferentially around the same thus adapting them to shift the sheet on the cylinder, in combination with means for printing the sheet at its initial position and for repeating the impression on a different part of the sheet after it has been shifted.

The invention further consists in the novel combinations of parts and devices, and novel construction of parts and devices hereinafter set forth.

In the accompanying drawing forming a part hereof, Figure 1 is a partial side elevation of a press embodying my invention. Fig. 2 is a transverse vertical section of the cylinder and its actuating gears. Figs. 3 and 4 are sections on the line 3—3 of Fig. 2, showing the parts in different positions.

In said drawing 5 represents the drive shaft, 6 the pulley mounted thereon which receives the driving belt, and 7 is the gear by which it actuates the press. The gear 7 meshes with a gear 8 on shaft 9, and gear 8 engages a gear 10 on one of the end journals 11 of the cylinder of the press, and through such gear drives the cylinder. Attached to the side of gear 8 and moving therewith is a second gear 12, somewhat larger than gear 8, and this gear 12 meshes with a gear 13 loose on journal 11 and somewhat smaller than gear 10. The gear 13 embodies a cam for controlling the grippers, and I call it the cam gear, and its rotation is preferably faster than that of gear 10, and desirably about one fourth faster. The journals 11 are supported in bearings 14, both of which rest on springs 15, permitting the cylinder to rise and fall in the manner usual in two revolution processes. The reciprocating type bed is shown at 16, and at 17 are the inking rollers therefor. The feed table for feeding the sheets is shown at 18, and at 20 is the take off roller which detaches the sheet after it has been printed and diverts it on to the discharge tapes 21.

As will be obvious, the foregoing structure will cause the bed and impression cylinder to be moved relatively to each other to thereby cause intermittent printing impressions on the sheets of paper, and that these impressions will be formed progressively in a direction along the surface of the sheet which is parallel to the line of movement of the reciprocating bed. It will also be apparent that other mechanisms might be substituted for those above described for ac-

complishing the same results without departing from the scope of the invention, as indicated in the claims appended hereto.

The cylinder of the press is indicated at 22 and is best shown at Figs. 2, 3 and 4. It is provided with a raised surface at 23 supporting the sheets at the points where the impressions are made. This surface extends nearly half way around the cylinder, and the balance of the surface 24 is sunken as shown to permit the circumferential travel of the grippers. The grippers are shown at 25, and they are mounted upon a rod 26 which is adapted to oscillate on its axis when the grippers are opened and closed, that movement being imparted to the rod at proper times by tumblers on the frame of the machine at the ends of the cylinder. These tumblers are not illustrated as their construction and use are well known. The gripper rod 26, and a rest bar 27 between which and the grippers the edges of the sheet are gripped, are both supported at the ends by arms 28 standing outward from rings or bands 29 loosely surrounding the journals 11. The position of the grippers and rest bar are changed at each printing operation, and these changes are effected by arms 30, 30, and 31 the ends of which are at opposite sides of the gripper rod and bar, the arms 30 being at the advance side and the arm 31 at the rear side. These arms are all mounted on a shaft 33 extending through the journals 11, and the arm 31 is secured rigidly to the shaft by screw 32 while the arms 30 are free thereon. The arm 31 is thus able to move the grippers circumferentially of the cylinder when motived by the shaft 33.

The actuating of shaft 33 is obtained by the following mechanism: On the end of shaft 33 adjacent to the gear 10 is a pinion 34, and meshing with pinion 34 is a toothed segment 35 pivoted at 36 to one of the spokes of gear 10. An arm 37, rigid with the pivot 36 of the segment, projects laterally from the same and carries a roller 38 which is entered in the channel cam 39 formed on the side face of the cam gear 13. This cam 39 is of the shape shown in Fig. 1 and is adapted to cause such motion of the shaft 33 as will cause the shifting of the grippers. This shifting carries the grippers from the position of Fig. 3 to that of Fig. 4, and in it the sheet is carried around the cylinder, thus transferring the part X on which the first impression was made to position over the sunken part of the cylinder, and positioning a fresh part Y of the sheet upon the raised part of the cylinder in readiness to receive the second impression. The grippers after releasing the sheet, are also returned to the position of Fig. 3 in readiness for another sheet.

The operation of the press has been sufficiently described above it is believed. It will be noted that the cam 39 rotating at a faster speed than the cylinder, is enabled to effect the shifting of the grippers between the impressing contacts with the type bed, and that it is also adapted to give periods of rest to the grippers between the shifting operations.

I have shown my improvements as embodied in a printing press in which is shown a reciprocating member for carrying the type forms, but it will be apparent that other structures of type form carrying members may be used equally as well with my improvements, and also that many changes may be made in the means for shifting the sheet circumferentially of the cylinder without departing from the spirit of my invention, and all such changes and variations are contemplated as fairly come within the scope of the appended claims.

I claim:—

1. In combination, an impression cylinder, sheet gripping means movable circumferentially of the cylinder, means for rotating the cylinder, a cam rotating faster than the cylinder, and means operated by said cam for shifting the said sheet gripping means.

2. The combination of an impression cylinder having a segmental impression surface and a complemental non-impression surface; with sheet gripping means movable circumferentially of the cylinder about the non-impression surface, means for rotating the cylinder, a cam rotating faster than the cylinder, and means operated by said cam for shifting the said sheet gripping means.

3. In combination, a cylinder; with sheet gripping means mounted upon the cylinder and movable circumferentially thereof, a rock shaft mounted in the cylinder and controlling said sheet gripping means; means for rotating the cylinder, and means for rocking said shaft during its rotation with the cylinder at predetermined intervals to shift the sheet gripping devices and move the sheet circumferentially of the cylinder to produce separated impressions thereon.

4. The combination of a cylinder having a segmental impression surface and a complemental segmental non-impression surface; with sheet gripping means mounted upon the cylinder and movable circumferentially thereof over the non-impression surface thereof, a rock shaft mounted axially of the cylinder and supporting said sheet gripping means; means for rotating the cylinder and said shaft, and means for rocking said shaft during its rotation with the cylinder at predetermined intervals to shift the position of the sheet gripping devices and move the sheet circumferentially of the cylinder to produce separated impressions thereon.

5. In combination, a cylinder, sheet gripping means mounted upon the cylinder and movable circumferentially thereof, a rock shaft mounted axially of the cylinder and supporting said sheet gripping means; means for rotating the cylinder, a segment mounted on said cylinder, a pinion on said shaft meshing with said segment, and means whereby said segment is operated so as to cause the shaft to shift the sheet gripping devices and move the sheet circumferentially of the cylinder to produce separated impressions thereon.

6. The combination of a cylinder having a segmental impression surface and a complemental segmental non-impression surface; with sheet gripping means mounted upon the cylinder and movable circumferentially thereof over the non-impression surface; a rock shaft mounted in the cylinder and supporting said sheet gripping means, a gear for rotating the cylinder, a cam, a segment pivotally mounted on said gear, a pinion on said shaft meshing with said segment, and means whereby said segment is operated by said cam to shift the position of the sheet gripping devices and move the sheet circumferentially of the cylinder to produce separated impressions thereon.

7. In combination, a rotatable cylinder, a shaft extending axially of the cylinder, sheet seizing devices carried by said shaft and movable circumferentially of the cylinder, a gear on the cylinder for rotating the same, a cam loosely mounted on the cylinder shaft adjacent said gear, means for rotating said cam, a pinion on the said shaft, a segment pivotally mounted on said gear and meshing with said pinion, and means on said segment engaging said cam whereby the sheet gripping means are caused to shift the sheet circumferentially of the cylinder to produce separated impressions thereon.

8. In combination, a rotatable cylinder, a shaft extending axially of the cylinder, arms on said shaft projecting radially of the cylinder, sheet seizing devices carried by said arms at the peripheries of the cylinder and movable by said arms circumferentially of the cylinder, a gear on the cylinder shaft for rotating the same; a cam loosely mounted on the cylinder shaft adjacent said gear; means for rotating this cam faster than the cylinder, a pinion on the said shaft, a segment pivotally mounted on said gear and meshing with said pinion, said segment having an arm engaging said cam whereby the sheet gripping means are caused to shift the sheet circumferentially of the cylinder to produce separated impressions thereon.

BURT F. UPHAM.

Witnesses:
EDW. S. EVARTS,
ESTHER ABRAMS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."