Aug. 7, 1945. E. W. WORTHINGTON 2,381,093

PRINTING PRESS

Filed Jan. 30, 1943 2 Sheets-Sheet 1

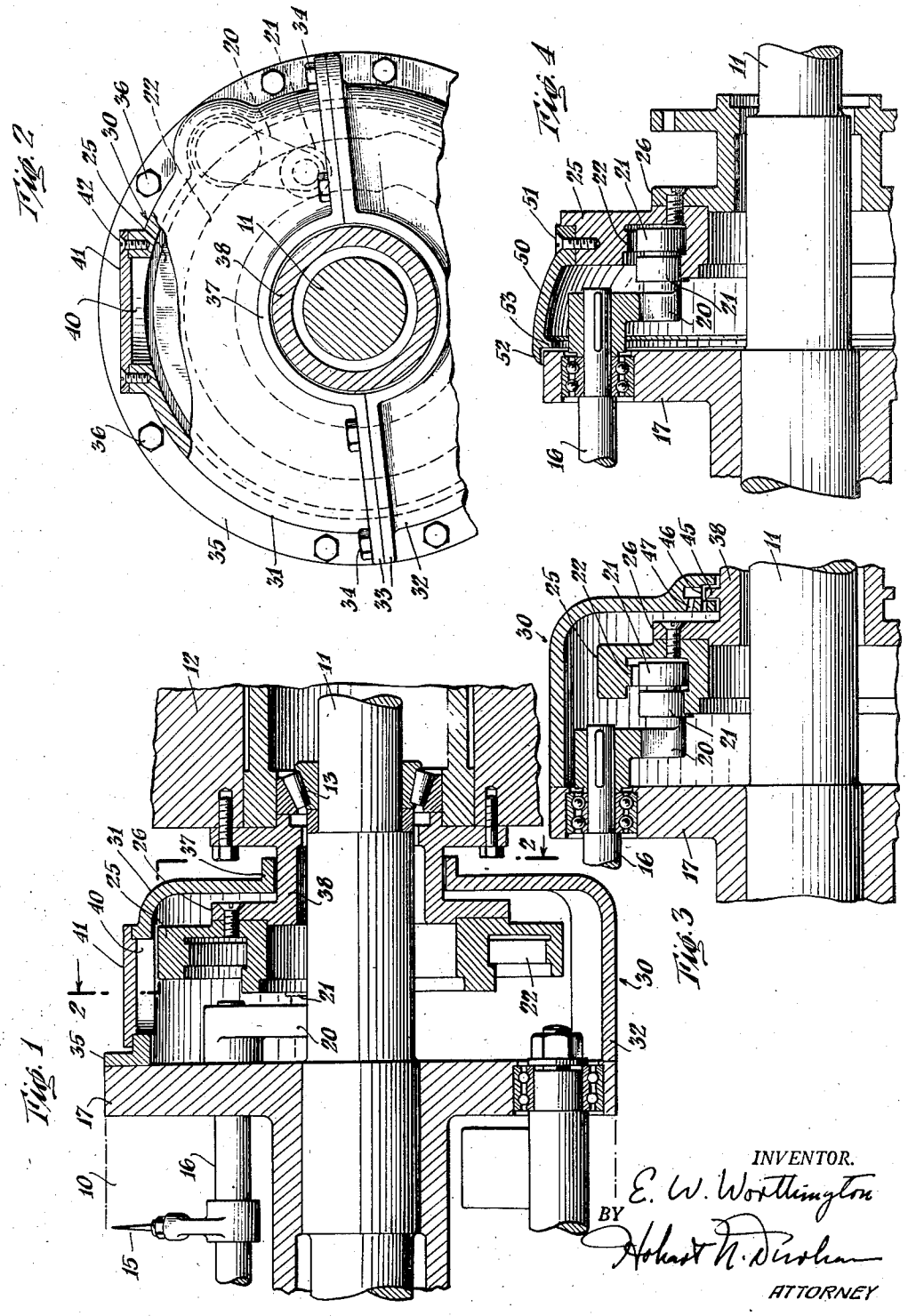


Fig. 1

Fig. 2

Fig. 3

Fig. 4

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Fig. 6

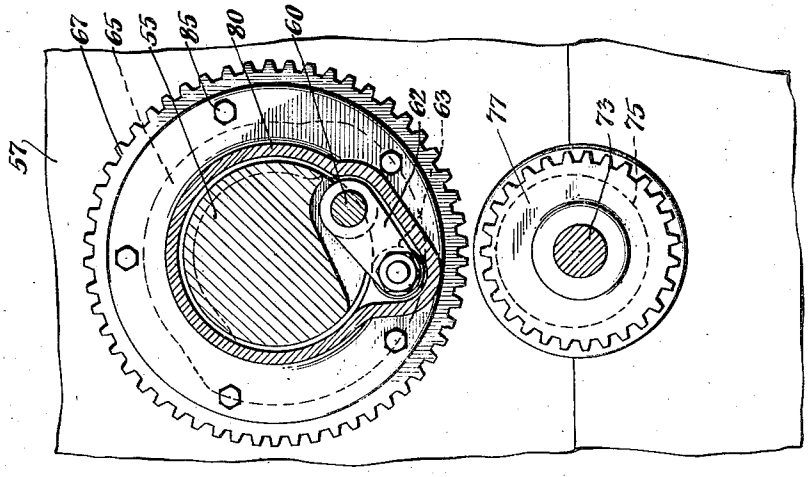
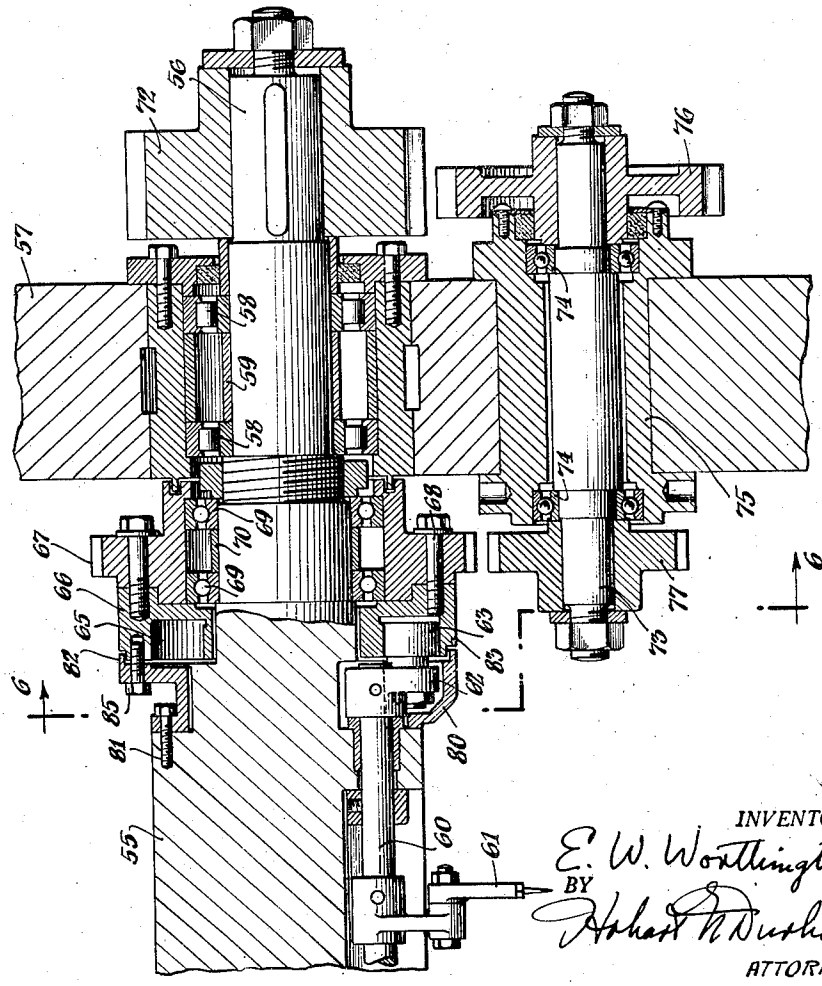


Fig. 5



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PRINTING PRESS

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Application January 30, 1943, Serial No. 474,071

2 Claims. (Cl. 101—409)

The present invention relates to printing presses, and more particularly to certain cylinders of printing presses having paper gripping, taking or securing mechanism thereon.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations, and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description serve to explain the principles of the invention.

It is an object of the present invention to provide means for preventing paper dust and other debris from impairing the proper operation of the actuating or cam mechanism customarily used with sheet and web gripping, taking or securing cylinders on a printing press. A further object is the provision of means for insuring the proper lubrication and hence the long wear of such actuating or cam mechanism. The invention provides an enclosure about such mechanism the object being to close off the mechanism from substances which ordinarily settle there and impair the efficient operation of the press, and to retain lubricant about the mechanism. The invention further provides such closure means which are easily installed and removed and which permit inspection and adjustment of the mechanism without removal. Still another object is the provision of an efficient closure about such a mechanism having a movable or rotatable cam race and which may also be utilized to lock the cylinder and cam race carrying member together when the gripping or securing mechanism is not to be operated.

Of the drawings:

Fig. 1 is a longitudinal cross sectional view of a typical and illustrative embodiment of the present invention as applied to a folding cylinder of a newspaper printing press;

Fig. 2 is a transverse cross sectional view of the embodiment of the invention shown in Fig. 1 and taken along line 2—2 of Fig. 1;

Fig. 3 is a longitudinal cross sectional view of a modified embodiment of the present invention as applied to the cylinder shown in Fig. 1;

Fig. 4 is a longitudinal cross sectional view of a further embodiment of the invention as applied to the folding cylinder shown in Fig. 1;

Fig. 5 is a longitudinal cross sectional view of another typical and illustrative embodiment of the invention as applied to the cutting and collecting cylinder of a rotary printing press; and

Fig. 6 is a transverse cross sectional view taken along line 6—6 of Fig. 5.

Referring now to an illustrative embodiment of the invention as shown by way of example in the accompanying drawings, there is provided in the folding mechanism of a newspaper printing press a folding cylinder having impaling pins and actuating mechanism therefor of a generally customary design. The impaling pins are mounted on a shaft which is mounted for rotary movement within the cylinder in order to thrust the pins beyond the surface of the cylinder and withdraw them within the cylinder. A stationary member is provided at one end of the cylinder having a cam race in its face adjacent the end of the cylinder, and this race receives a cam follower eccentrically secured to the end of the shaft in order to actuate the impaling pins at predetermined times.

An annular cover plate is provided to enclose the cam actuating mechanism at the end of the cylinder, and, in one embodiment of the invention, the cover plate is secured at one periphery to the end of the folding cylinder adjacent the stationary cam race member and extends over the cam follower and cam race, having its other periphery closely adjacent to the stationary member. In another embodiment of the invention the cover plate is secured to the stationary member and extends closely adjacent to the folding cylinder at its other periphery, also providing an effective protection for the cam mechanism.

A further embodiment of the invention provides an oil seal between the cover plate and the member to which it is not attached, whereby lubricant may be more effectively retained about the cam mechanism. An aperture is perferably provided in the cover plate of the embodiments of the invention and an inspection cover is removably secured thereover, allowing access within the cover plate for adjustment and repair of the cam mechanism or for the introduction of lubricant.

In another illustrative embodiment of the invention a protective cover plate is provided for the cam mechanism of a cutting and collecting cylinder of a printing press, and this cylinder, as in the embodiments mentioned, is provided with impaling pins mounted on a shaft which is actuated by cam mechanism at the end of the cylin-

der. In this embodiment a cam race is provided in a member at the end of the cylinder which is rotatably mounted coaxially with the cutting and collecting cylinder. Means are provided for driving this member at a different speed than the cylinder when the cylinder is collecting products, and for not driving the member when the cylinder is being operated straight run, or not collecting.

A substantially cylindrical cover member is provided, secured to the rotatable cam race carrying member and extending closely adjacent to the end of the cylinder, covering and protecting the cam race and the cam follower. Means are provided for securing the cover member to the cylinder as well as the cam race carrying member when it is desired to operate the cylinder straight run and the impaling pins are not to be actuated.

It will be observed that in the construction above described the sealing space between the cover and cylinder members or cover and cam members is formed by and between opposed portions of the members which overlap longitudinally or in the direction of the axis of the cylinder, which portions are closely arranged but lie out of abutting contact to prevent friction between the relatively rotating members, which is important, while at the same time providing a sealing space containing a very thin sealing layer of lubricant. This space in each case opens at its inner side into the cover and at its outer side to the atmosphere. In the relative rotation of the members, lubricant automatically feeds into this space very slowly but at such rate as to keep the space constantly sealed against the possible indraft of paper dust or other debris by suction, while allowing a small amount of lubricant to escape or to be exuded from time to time to permit removal of that at the outer side of the space which may have gathered dust from the atmosphere and to prevent possible indraft of the thus contaminated lubricant. The lubricant which is allowed to escape may be periodically wiped off. By this means friction between the moving parts and access of dust to the cover are not only prevented, but the grease or other lubricant forming the seal in the sealing space is kept in a cleanly state and prevented from becoming contaminated by particles liable to cause friction between the moving parts. Each construction described also provides a cover which obviates the use of packing and its attendant disadvantages, which by being out of contact with any relatively movable part prevents heating and binding of parts and the production of sparks liable to cause fires, and which ensures the constant and automatic sealing by lubricant of the space or channel between opposed relatively movable surfaces to exclude dust and to keep the surfaces cool.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the illustrative embodiments of the present invention shown in the accompanying drawings, and referring first to the embodiment of Figs. 1 and 2, the folding mechanism of a rotary newspaper printing press is provided with a folding cylinder 10 of a customary construction which is well understood by those skilled in the art. As embodied, the cylinder 10 has an axially extending shaft 11 which is mounted in the sturdy side frames 12 of the printing press or folder by means of tapered roller bearings 13. Means (not shown) are provided for driving the shaft 11 whereby cylinder 10 is rotated for operation in the folder of the press.

A plurality of impaling pins 15 are mounted on a shaft 16 which is positioned within the cylinder and mounted for rotary movement in the ends 17 of the cylinder to thrust the pins 15 beyond the surface of the cylinder or to withdraw them within it. An arm 20 at one end of shaft carries a cam follower 21 which is received within a cam race or groove 22. The cam race 22 is of a configuration to actuate the impaling pins 15 at desired and predetermined times, thrusting them out of the cylinder 10 to pierce and carry with the cylinder the traveling web and withdrawing them when the sheet is to be released. The cam race 22 is formed in the face of an annular cam member 25, which is secured to a cam carrier member 26, this member in turn being firmly secured to the frame 12.

An annular flared cover member 30 is provided about the cam mechanism which has been described. The cover plate 30, as seen in Fig. 2, is composed of two halves 31 and 32, each having abutting radially extending flanges 33 which are secured together by a plurality of screws 34.

The outer periphery of the cover plate 30 has an outwardly extending flange portion 35 by means of which the plate is secured to the end 17 of the cylinder 10 with a plurality of tap bolts 36, the plate thus being fixed to rotate with the cylinder. The inner periphery of the cover plate is formed in an axially extending flange portion 37, and the inner cylindrical surface of this portion is positioned to surround a cylindrical portion 38 of the cam carrier member 26. The flange portion 37 and the cylindrical portion 38 are very closely adjacent to each other but not in touching relationship, as the members are relatively rotatable and frictional contact is to be avoided.

It is apparent that the cover plate 30 completely surrounds the cam mechanism for actuating the impaling pins 15, preventing the settling of paper dust and other press room debris upon the cam mechanism to impair its accurate and efficient operation. A circular aperture 40 is provided in the cover plate 30 and an inspection cover 41 is removably secured thereover by screws 42, whereby access may be had to the cam mechanism for adjustment and repair, and lubricant may be inserted within the cover plate. A substantial amount of lubricant may be kept within the cover at all times to insure the thorough lubrication of the cam mechanism, as it will fall into the outer portion of the cover plate when the folding cylinder is not rotating, and will be retained and distributed about said outer portion by centrifugal force when the press is in operation. The loss of lubricant through the small annular aperture between the flange 37 and the cylindrical portion 38 will thus be of negligible proportions.

Referring now to the illustrative embodiment of Fig. 3 of the drawings, means are provided for forming an oil retaining joint between the cover plate 30 and the cam carrier member 26. As embodied, a rib 45 extends circumferentially of the cylindrical portion 38 of the cam carrier member and projects into a corresponding circumferential groove 46 in the inner periphery of the cover plate 30. Drain holes 47 are provided to permit

drainage of any lubricant which may accumulate in the groove 46.

The embodiment of the invention shown by way of example in Fig. 4 of the drawings provides a substantially cylindrical cover plate 50 to prevent the accumulation of dirt, dust and other debris about the cam mechanism. The cover plate 50 is secured to the annular cam member 25 at its outer periphery by means of screws 51, and extends to a position closely adjacent the end 17 of cylinder 10, having a portion 52 to slightly overlap the outer surface of the cylinder and a substantially vertically disposed flange portion 53 to face the cylinder end 17.

Referring now to the embodiment of the invention shown by way of example in Figs. 5 and 6, the cutting and collecting cylinder 55 of a printing press has the shaft 56 by which the cylinder is rotatably mounted in the printing press or folder frame 57 by means of roller bearings 58, the bearings being held in spaced relationship and being held in axial position by means of a collar 59 secured to frame 57.

A shaft 60 is mounted within the surface of cylinder 55 for rotary motion and carries the impaling pins 61 which may be actuated to extend out of the surface of the cylinder or be withdrawn therewithin. An arm 62 is secured to the end of shaft 60 and has a cam follower 63 mounted thereon. The cam follower 63 is received within the cam race 65 provided in the face of cam member 66 adjacent cylinder 55.

The cam member 66 is mounted for rotation about the shaft 56 of the cutting and collecting cylinder, being secured to a gear 67 by means of tap screws 68, the gear being rotatably mounted on the shaft by ball bearings 69. These bearings are held in axial position by means of a collar 70 on shaft 56.

The shaft 56 of the cutting and collecting cylinder 55 is driven through a gear 72 at its end from the main drive train of the printing press (not shown), and this gear is also utilized to drive the cam member 66 when the cylinder is to be run collect and the impaling pins 61 actuated to grip the web. A shaft 73 is rotatably mounted by roller bearings 74 in an eccentric carrier 75 in the frame 57. The shaft 73 carries at its outer end a gear 76 and at its inner end a gear 77, these gears being engageable with gears 72 and 67 respectively when the eccentric carrier 75 is turned in frame 57. When these gears are engaged the cam member 66 will be rotated at substantially one-half the speed of the cylinder 55, and the cylinder is then adapted to collect sheets cut from the traveling web.

An annular cover plate 80 is provided to protect the cam race and follower from pressroom dust and debris and to retain lubricant about the cam mechanism. This plate is secured by means of a plurality of tap screws 81 to the end of cylinder 55 and rotates therewith. The other end of the plate extends closely adjacent to the cam member 66, having an axially extending portion 82 which extends into a corresponding circumferential indentation 83 of the cam member.

When the cylinder 55 is not to be utilized as a collecting cylinder and the impaling pins 61 are not to be actuated from the cam mechanism, the eccentric carrier 75 will be turned to bring gears 76 and 77 out of mesh with gears 72 and 67 respectively. When the cylinder is thus to operate straight run, the cover plate 80 is secured to the cam member 66 by a plurality of tap screws 85, whereby the cylinder, cover plate, cam member 66 and gear 67 all have correlative rotation and the cam mechanism is not in operation.

Although the invention has been shown and described in connection with certain cylinders in the folding mechanism of a printing press, it will be apparent that the invention is applicable and useful in connection with other rotating cylinders in a printing press having means for operating upon the web or sheets or products of the press which means have actuating or cam mechanism at the end of the cylinder. An example of such use of the invention would be in connection with the stitcher mechanism utilized for forming signatures and actuated by cam mechanism at the end of a rotatable cylinder.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In a printing press, in combination, a rotatably mounted cylinder having a shaft mounted therein for rotary movement to actuate paper gripping mechanism, means for driving said cylinder, a cam follower eccentrically mounted on said shaft at one end of the cylinder, a rotatably mounted member at the same end of the cylinder having a cam race to receive said cam follower, means for selectively driving said member at a different speed than said cylinder and for disengaging said members from the driving means, cover means secured to the cylinder and extending closely adjacent to said member and enclosing said cam follower and cam race, and means for securing said member to said cover means when said member is not being driven.

2. In a printing press, in combination, a rotatably mounted cylinder having a shaft mounted therein for rotary movement to actuate paper gripping mechanism, means for driving said cylinder, means for driving said shaft including a rotatably mounted member and connecting means between the same and the shaft located at one end of the cylinder, means for selectively driving said member at a different speed than the cylinder and for disengaging said member from the driving means, cover means extending closely adjacent to said member and secured to said cylinder and enclosing said connecting means, and means for securing said member to said cover means when said member is not being driven at said different speed.

EMORY W. WORTHINGTON.