Oct. 23, 1945. A. E. GOODWIN 2,387,390

INKING MECHANISM FOR DUPLICATING MACHINES

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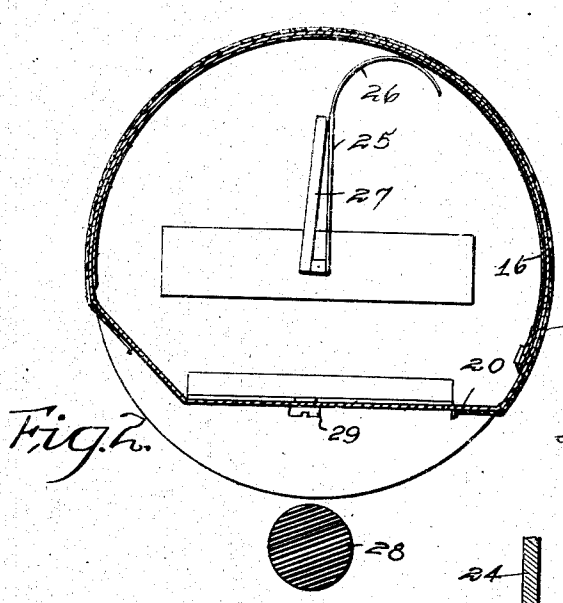


Fig. 2.

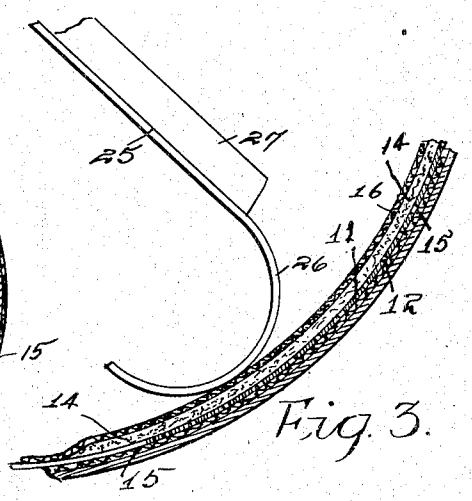


Fig. 3.

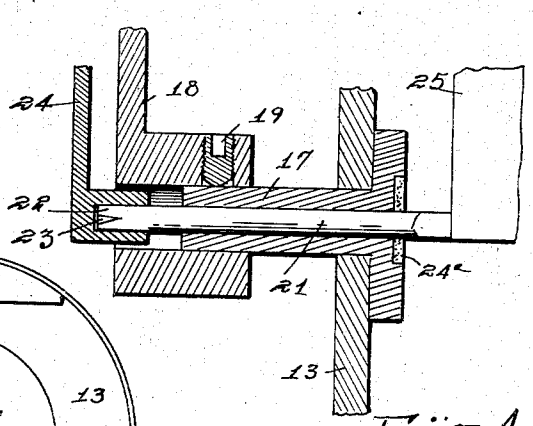


Fig. 4.

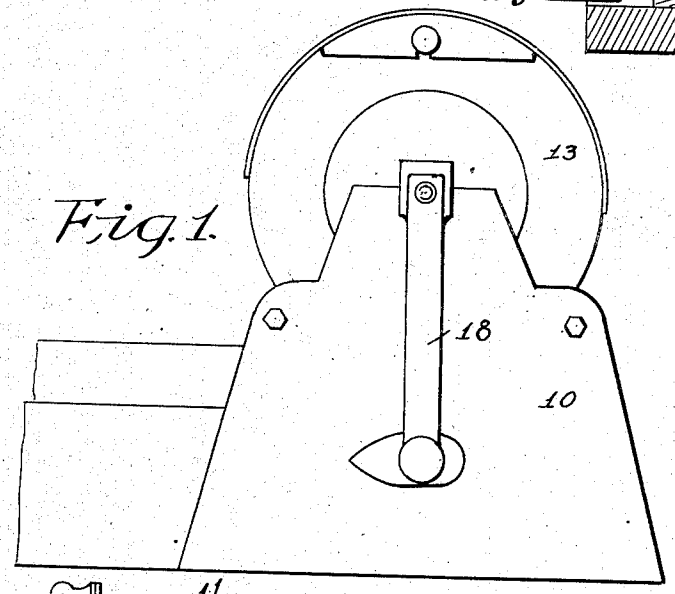


Fig. 1.

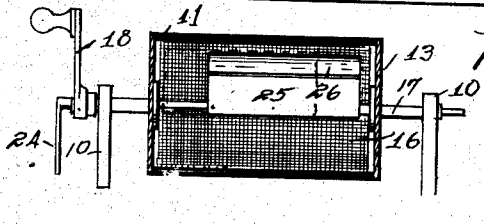


Fig. 5.

Inventor
Alfred E. Goodwin
by Owing & Hague, Atty's

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INKING MECHANISM FOR DUPLICATING MACHINES

Alfred E. Goodwin, Ottumwa, Iowa

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2 Claims. (Cl. 101—120)

My invention relates to that class of duplicating machines in which there is a hollow cylindrical roller having a porous cylindrical surface through which the ink passes to an outer cylindrical stencil having small openings through which the ink passes to effect a printing operation. With the duplicating machines now in use a considerable amount of time and effort by an operator is required in obtaining a uniform distribution of ink throughout the perforated portion of the stencil, and the printed sheets frequently have heavy and light printing in places, instead of the desired uniformity.

My object is to provide an inking mechanism of simple, durable and inexpensive construction in which a large supply of ink may be placed in the printing cylinder, thereby avoiding the necessity of frequently stopping work to add small quantities of ink.

A further object is to provide means for uniformly spreading ink upon the inner surface of the ink-retaining pad, which may be easily operated by a crank on the exterior of the machine, thus making it unnecessary for the operator to open the cylinder for such purpose.

In the accompanying drawing:

Figure 1 shows a side elevation of a part of a duplicating machine having my improvement;

Figure 2 shows an end view of the printing cylinder and ink reservoir, with the cylinder end removed. The printing cylinder is shown in section;

Figure 3 shows an enlarged detail sectional view of a portion of the printing cylinder and the ink spreading and wiping blade;

Figure 4 shows an enlarged sectional view of the shaft projected from the cylinder, the crank attached thereto, and the adjustable ink spreading and smoothing device thereon; and

Figure 5 shows a longitudinal sectional view of the printing cylinder and associated parts.

The machine base is indicated generally by the reference numeral 10.

The combined printing cylinder and ink reservoir comprises a sheet metal cylinder 11. The upper portion, approximately half of the cylinder, is provided with perforations 12. The closed ends of the cylinder are marked 13.

At that part of the interior of the cylinder adjacent the perforations I have applied a mat 14 of ink-retaining material, such for instance, as animal wool. This mat is contained between an outer layer of cloth 15, and a layer of flexible wire screen 16 is applied to the inner surface of the mat 14.

The cylinder is provided at each end with a hollow bearing shaft 17, and a crank 18 is detachably secured to the crank by a set screw 19.

The lower portion of the cylinder is formed flat, as shown at 20 in Fig. 2, and the sides of the cylinder extend from said flattened portion to the perforations 12, also the ends of the cylinder, are made liquid tight, thereby forming an ink receptacle within the cylinder. When the cylinder is in its position at rest, as shown in Fig. 2, the ink is held in the space below the perforations 12, and when the cylinder is rotated, as when printing, some of the ink flows over a portion of the perforated portion of the cylinder and returns by gravity when the cylinder is resting.

For the purpose of evenly distributing ink throughout the entire area of the ink pad I have provided a shaft 21 having its ends extended through the hollow shaft members 17, having at one end an angular extension 22 on which is formed an indicating notch 23. A crank 24 is detachably fitted to said angular end, by which the shaft may be rotated and also moved longitudinally within its bearings. At the interior of the printing cylinder the ink distributing and smoothing blade is fixed to the shaft 21. This blade has its body portion extended radially at 25 and its outer end portion is formed with a curved portion in the form of a half circle, 26, as shown in Fig. 3. The blade is made of thin, flexible material and yieldingly engages the screen 16. Its straight portion is braced by the brace 27 fixed to the blade and to the shaft. The length of the blade is substantially less than that of the cylinder, as shown in Fig. 5, so that it may be adjusted longitudinally of the shaft to engage only selected areas of the screen 16.

An ink-sealing disc 24*a* of fibrous material surrounds the shaft 21 and is set into the enlarged inner end of the shaft 17.

The usual printing roller 28 is mounted below the printing cylinder.

An ink filling opening is formed in the flat bottom portion, and a screw plug 29 is seated therein.

In practical use I select an ink having a mineral oil base and which does not congeal on the screen wire or wool mat. This is applied through the filling opening when the cylinder is in an inverted position, opposite from that shown in Fig. 2. When the cylinder is in normal position this ink will be retained within the bottom of the cylinder and does not reach the perforations 12. When the ink is thus applied, then, and in order to freely and easily supply an equalized layer of ink to the entire printing surface of the outer

cloth, first, the cylinder is rocked back and forth or rotated until the ink has impregnated the entire surface of the mat **14** and the cotton cover **15** on the exterior of the cylinder. Then the cylinder is moved to the position shown in Fig. 2 and the major portion of the ink returns by gravity to the receptacle at **20**. Then the operator grasps the crank **24** and moves the blade backwards and forwardly, in yielding pressure with the entire inner surface of the screen **16**, and thereby applies a yielding pressure to the packing **14** to force ink into the mat **14** in a uniform manner and throughout the area of the perforated portion of the roller.

For example, when the cylinder is moved from its normal position, as shown in Fig. 2, the ink flows through the screen **16** and upon the mat **14** which, being of fibrous material, causes the ink to be distributed throughout it by capillary action. This distribution of the ink is further advanced by pressure of the roller **28** upon the outer surface of the cylinder. The pressure of the ink distributing and smoothing blade upon the inking pad retards the flow of ink from the point where said blade engages the inking pad to the rear end of the pad, and thereby prevents the flow of ink from the rear end of the pad to the outer surface of the cylinder. When this has been done the duplicating machine is operated in the ordinary manner. A large number of prints may be made before it is necessary to press more ink into the ink pad **14**. When this is necessary the operator simply revolves the cylinder for a few turns and then operates the ink distributing and smoothing blade for a few times. This process may be continued until all of the ink contained in the cylinder has been used.

With my improvement ink need only be supplied at long intervals, and smooth and uniform printing is effected.

It is not always necessary to rock the cylinder back and forth to bring the ink into contact with the mat or fibrous material, since the cylinder is revolved in an anti-clockwise direction in the course of operation which necessarily causes the ink to flow from the reservoir over the front end of the mat and is carried by capillary attraction plus the action of the roller on the outside to the point where the blade prevents it from flowing on to the unused portion of the pad. This is continuous. The blade is used to hasten the above action, to arrest the flow of ink, and to replenish and evenly distribute the ink when the rotation of the drum and the capillary attraction fail to supply the ink sufficiently. It is not necessary to always rotate the drum in addition to the rotation of its regular operation or even invert it to increase the ink on the outer pad since the fibrous material (except when the reservoir has been allowed to become dry) always contains a quantity of ink and it is only necessary to oscillate the yielding blade at the point where ink is needed, even though the cylinder be in such position that the reservoir is at the bottom. The pressure of the yielding blade squeezes the fibrous material which retains a quantity of ink. The ink is thus forced to the outer surface pad when and where needed.

When it is desired to print from a selected portion only of the printing cylinder, say for instance, one end portion extending to near the central portion, then the blade **25** is moved longitudinally to the selected portion and operated to force the ink into and through the selected portion of the perforated wall and inking cloth. The portions of the inking pad not operated upon by the blades will not have the ink forced through the perforated wall and into the inking cloth, and when it is desired to print from the entire surface of the printing cylinder, the blade is moved over the entire interior of the cylinder for forcing the ink from the retaining pad and through the perforated cylinder and the cloth **15**.

When in use it is desirable to have the ink spreading blade in about the position shown in Fig. 2, and this may be done by the operator by referring to the indicating mark **23** which is positioned at right angles to the blade **25**.

I claim as my invention:

1. In a duplicating machine, a rotatable cylinder for receiving and supporting a stencil over the outer surface of a section thereof, said section being perforated, an ink-retaining well in said cylinder, with said perforated section constituting a wall for said well, an ink-retaining and absorbing pad supported against the inner surface of said perforated section to absorb ink from said well as said cylinder is rotated, yieldable means within said cylinder manually movable independently of said cylinder in pressing engagement over said pad to squeeze ink therefrom through selected portions of said perforated section, and means supporting said yieldable means for pivotal movement and for movement axially of said cylinder.

2. In a duplicating machine, a rotatable cylinder having a perforated peripheral portion adapted to support a stencil on its outer surface, an ink well within said cylinder, said perforated portion constituting a wall for said ink well, a compressible ink-retaining pad supported against the inner surface of said peripheral portion, with ink from said well being supplied to said pad as said cylinder is rotated, manually operated means rotatable within said cylinder and yieldably supported against and movable over the inner surface of said pad to compress the pad and squeeze ink therefrom through said perforated portion, said yieldable means being normally rotatable with said cylinder and positionable relative to said ink pad to prevent the passage of ink between the portions of the pad at opposite sides of said yieldable means.

ALFRED E. GOODWIN.