

Dec. 24, 1940.

K. KLINGLER

2,226,311

DEVICE FOR INKING IN THE COPPER CYLINDER IN INTAGLIO PRINTING

Filed March 12, 1938

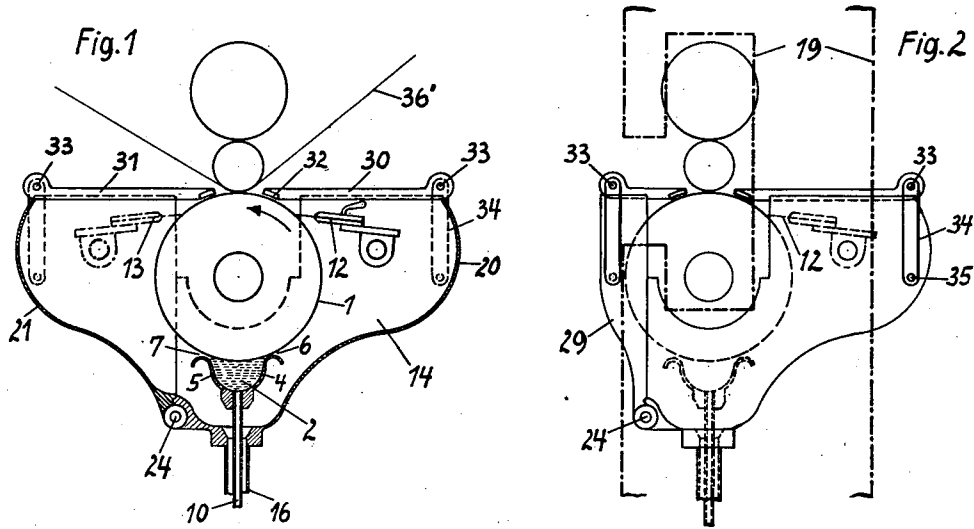
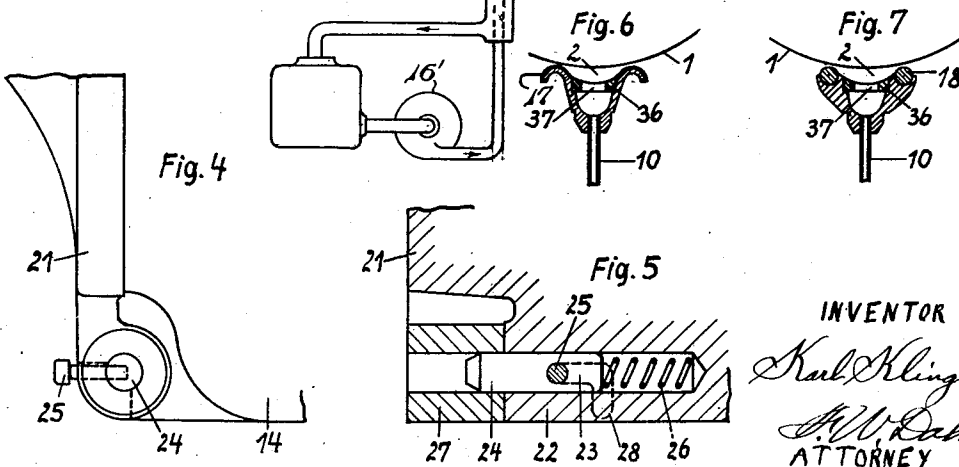
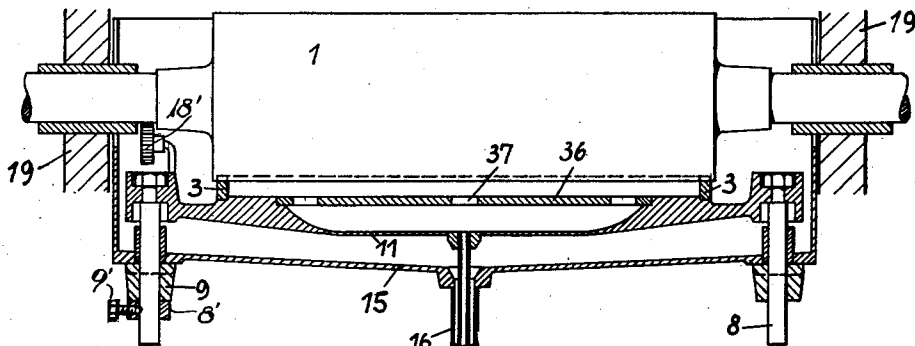


Fig. 3



INVENTOR

Karl Klingler,
Attorney

UNITED STATES PATENT OFFICE

2,226,311

DEVICE FOR INKING IN THE COPPER CYLINDER IN INTAGLIO PRINTING

Karl Klingler, Wurzburg, Germany, assignor to the firm Schnellpressenfabrik Koenig & Bauer, Aktiengesellschaft, Wurzburg, Bavaria, Germany

Application March 12, 1933, Serial No. 195,661
In Germany October 23, 1936

11 Claims. (Cl. 101—157)

This invention refers to intaglio or undersurface printing machines and particularly to a device for inking in a copper intaglio printing cylinder, from which, while it is rotating, the surplus ink is stripped off by a doctor which is axially moved to and fro.

With a general known device of this kind, the copper cylinder dips in an ink trough arranged underneath same opposite to the printing line.

Another method for inking in the copper cylinder is to transmit the ink to the copper cylinder by means of a long nozzle into which the ink is led by pressure.

The present invention is based on the idea to provide a method of supplying and apparatus for supplying ink to the printing surface in such a manner that the advantages resulting from inking in by liquid over-pressure are combined with the advantages of a copper cylinder bathing in an ink trough.

A further object of the invention is to provide means to avoid wear of the printing form in the case where the ink is transmitted to the copper cylinder by liquid pressure.

A further object of the invention is to provide a mechanism to avoid, when using a copper cylinder that dips in an ink trough, that too much ink is led to the doctor which would cause streaks to appear in the printing.

A further object of the invention is to provide means which make it possible to use the inking in device for running the copper cylinder in both directions.

A further object of the invention is to provide means, for preventing any access of air to the ink on its way from the ink reservoir to the form cylinder, i. e.; until after the ink has been applied to the form cylinder, by which an evaporation of the ink in the dipping trough and by this a detrimental alteration in the composition of the ink is avoided. Besides this invention allows the quantity of the ink in the ink trough to be small.

A further object of the invention consists in the provision of an inking in device facilitating the use of copper cylinders of varying diameters.

Further objects, features and advantages will be more clearly understood in connection with the accompanying drawing.

Fig. 1 is a schematic sectional elevation of the inking-in device if one doctor is arranged at each side of the copper cylinder.

Fig. 2 represents a side elevation of the inking-in device with only one doctor.

Fig. 3 indicates a partial section of Fig. 1, taken through the axis of the cylinder.

Fig. 4 shows the swing axis of the longitudinal wall of the ink housing which can be moved down or removed altogether.

Fig. 5 is a segmental view in section, taken through the swing axis of Fig. 3.

Figs. 6 and 7 illustrate each a cross section through the ink trough.

Underneath the copper cylinder 1 is arranged an ink trough 2. The two longitudinal walls 4 and 5 of the ink trough are distant from each other by 3" at least and are raised so far up to the circumference of the copper cylinder that there is a corresponding gap 6 and 7 produced between the copper cylinder and the longitudinal walls 4 and 5 of the ink trough, equal to the desired thickness of the ink film. The height of this gap 6 and 7 may be adjusted by raising and lowering the ink trough 2. For this purpose the ink trough 2 is connected with a bolt 8 on each side. Each bolt 8 is lodged in a stationary bearing 9 and may be adjusted in the height by adjusting means, such as worm and worm gear, which may be minded from outside the press frames or by means, of a collar 8' held by a setscrew 9' as shown.

The two concave end walls 3 of the ink trough (Fig. 3) are not tightly touching the copper cylinder, but leave a very small gap between copper cylinder and end wall. These end walls 3 replace special ink strippers at the ends of the copper cylinder, because they prevent splashing of the ink.

The ink-feed to the ink trough 2 is done by a piping 10 which runs into the bottom 11 of the ink trough 2. Midway of the height of the trough is arranged an intermediary wall 36 (Fig. 6). This intermediary wall has a series of holes 37, so that the ink is uniformly distributed all over the length of the copper cylinder. The ink is fed under constant and adjustable pressure as by a pump 16 so that the ink trough 2 is under liquid pressure. The copper cylinder dips into the ink under liquid over-pressure. Thereby the ink, by the rotating cylinder, is drawn into the gap which is formed by the copper cylinder and round bar 18 of the longitudinal wall of the ink trough. The so produced return ink causes the ink to come into a close contact with the copper cylinder.

A certain part of the ink will overflow at the contractions 6 and 7 between copper cylinder and ink trough under the effect of the over-pressure. This ink flowing downwards, as well

as the ink surplus stripped off by the doctors 12, 13 from the copper cylinder, is gathered in a special housing 14 which encloses the ink trough 2 and the copper cylinder. The bottom 5 15 of the housing 14 is provided with an outlet piping 16, so that the surplus ink may return to the ink mixing box. This device is preferably so arranged that the ink piping 10 is located inside the ink outlet piping.

10 The new inking in device allows also the use of copper cylinders of very different diameters. When using a smaller copper cylinder than shown on the sketch, the height of the ink trough is adjusted accordingly.

15 The half-cylindrical bent upper ends of the two longitudinal walls 4, 5 of the ink trough 2 are provided with a protecting cap 17 made of Bakelite or any other soft material (Fig. 6). It is also possible to form the two upper ends of the 20 ink trough of a round bar 18 of Bakelite or pressed material made of artificial resin. In this manner a damage of the printing surface of the copper cylinder is made impossible even in the case of negligent minding of the device.

25 On the two ends of the ink trough 2 may be arranged stops or distance rolls 18' which, in the working position, touch the shaft of the cylinder 1 and so avoid that the necessary smallest distance of the ink trough from the copper cylinder is fallen short of. The adjustment in the height 30 of the ink trough may be read on a scale which is connected with means (not shown in the drawing) for adjusting the trough 2 in its height.

With the device as in Fig. 1 two doctors 12, 35 13 axially moved to and fro are provided of which one is always out of operation according to the turning direction of the copper cylinder. The doctor 12 may be arranged either in the housing 14 or in the press frame 19. The doctor 13 can 40 only be lodged in the side frames of the housing 14, as usually there is no frame 19 at this point, as Fig. 2 shows.

One or both longitudinal walls 20, 21 of the ink trough housing 14 are made shiftable so that 45 the accessibility to the inside of it is facilitated and removal of the copper cylinder 1 is made possible. For this purpose the longitudinal wall 21 is connected with the bottom of the housing 14 by hinges 24.

50 If the two longitudinal walls 20 and 21 of the housing are made exchangeable, it is sufficient to provide for one doctor only, even in the case of changing the turning direction of the copper cylinder. In this case an indentation in the 55 shape of a bayonet lock 23 is provided (Figs. 4 and 5) in the boss 22 of the swing wall 21. This serves for taking up a stop pin 25 lodged in the joint bolt 24. When the swinging wall 21 is to be raised, the joint bolt 24 is moved axially 60 against the pressure of the spring 26 until it gives free the lodging 27 of the housing 14. Then the stop pin 25 is moved in the part 28 of the indentation so that it is fixed in its axial position. After this the longitudinal wall 21 may be en- 65 tirely removed, without any difficulty.

If the machine is provided for only one turning direction, it is necessary to arrange for a room-saving, flat closing wall 29, on that side 70 of the copper cylinder on which there is no doctor. As soon as, however, in connection with a supplement of the machine made later on, another doctor lodging is necessitated at this point, this housing wall 29 may be exchanged without any trouble against another 21 which contains a 75 doctor lodging.

If desired, the housing wall may also be closed very tightly on the upper side whereby the doctor is located inside the housing. In order to be in a position to use also copper cylinders with varying diameters in spite of this, the two upper closing walls 30 and 31, as well as the tightening bars 32 which are very near to the copper cylinder 5 are arranged to swing upon the journals 33. The bolt journals 33 are supported by arms 34 which are arranged to swing upon stationary journals 10 35.

In this manner the lid 11 may be tangentially pushed back when raised before it is moved upwards, without being hampered by the paper web 15 36'.

The objects of the invention may be manifold and may vary and the above description and the drawing show only certain embodiments of the invention.

What I claim is:

1. In an intaglio machine, the combination of a printing cylinder with an ink trough arranged underneath the cylinder into which trough the cylinder dips, and a protecting member of material softer than that of the cylinder on the upper portions of the walls of the ink trough to prevent contact of such wall portions with the cylinder. 20

2. A device as in claim 1, said member being made of artificial resin. 25

3. In an intaglio machine the combination of a printing cylinder with an ink trough arranged underneath the cylinder into which trough the cylinder dips, said trough being adjustable toward and from the cylinder, and means whereby 30 engagement of the upper margins of the trough with the surface of the cylinder is positively prevented.

4. In an intaglio machine, the combination of a printing cylinder with an ink trough arranged underneath the cylinder into which trough the cylinder dips, said trough being adjustable toward and from the cylinder, and means for preventing damage to the cylinder by contact of the upper margins of the trough with the surface 35 of the cylinder.

5. In an undersurface printing machine, the combination of an ink trough, a rotary printing cylinder above said trough and dipping into it, said trough extending over a substantial distance 40 circumferentially of said cylinder and having the upper portions of its longitudinal walls at an interval from said cylinder corresponding to the desired thickness of the film of ink to be applied to the cylinder and means to maintain the ink 45 in said trough under pressure against said cylinder.

6. In an undersurface printing machine, the combination of an ink trough, a rotary printing cylinder above said trough and dipping into it, 50 said trough extending over a substantial distance circumferentially of said cylinder and having the upper portions of its longitudinal walls at an interval from said cylinder corresponding to the desired thickness of the film of ink to be applied 55 to the cylinder and said trough having a round spindle of compressed fiber forming the upper margin of each longitudinal wall of said trough.

7. In an undersurface printing machine, the combination of an ink trough, a rotary printing 60 cylinder above said trough and dipping into it, said trough extending over a substantial distance circumferentially of said cylinder and having the upper portions of its longitudinal walls at an interval from said cylinder corresponding to the 65 70 75

desired thickness of the film of ink to be applied to the cylinder, a housing for said cylinder and trough, a side wall of said housing being pivotally mounted adjacent the bottom of the housing, a doctor on said wall, and means whereby said wall may be readily set up at either side of the housing, so that a single doctor serves for either direction of rotation of the cylinder.

8. In an undersurface printing machine, the combination of an ink trough, a rotary printing cylinder above said trough and dipping into it, said trough extending over a substantial distance circumferentially of said cylinder and having the upper portions of its longitudinal walls at an interval from said cylinder corresponding to the desired thickness of the film of ink to be applied to the cylinder, a housing for said cylinder and trough, a doctor on a side wall of the housing, and means for supporting said side wall pivotally adjacent the bottom of the housing, including retractible hinge pintles permitting ready removal of said wall from said housing.

9. An undersurface printing press comprising a rotary intaglio printing cylinder, means cooperating therewith for printing upon rotation of the cylinder in either direction including an ink trough having its sides so constructed and arranged as to control the thickness of the film of ink applied to said cylinder in either direction of its rotation, means for maintaining a body of ink in said trough under pressure against said cylinder, and means for adjusting said trough bodily toward and from said cylinder to vary the thickness of the film of ink applied to the cylinder.

10. An undersurface printing press comprising an intaglio printing cylinder that prints directly on the paper by means of small ink-filled depressions in its periphery, an ink trough below said cylinder into which said cylinder dips, the distance between the upper walls of said trough and the periphery of said cylinder corresponding to the desired thickness of the film of ink to be applied to said cylinder, said walls being at least three inches apart so that the trough extends about and covers a substantial circumferential part of said cylinder, means for causing the ink in said trough to be held under pressure against said cylinder, and a constantly reciprocated doctor bearing against the surface of the cylinder to remove all ink except that in the depressions in its periphery.

11. An undersurface printing press comprising an intaglio printing cylinder that prints directly on the paper by means of small ink-filled depressions in its periphery, an ink trough below said cylinder into which said cylinder dips, the distance between the upper walls of said trough and the periphery of said cylinder corresponding to the desired thickness of the film of ink to be applied to said cylinder, said walls being at least three inches apart so that the trough extends about and covers a substantial circumferential part of said cylinder, means for causing the ink in said trough to be held under pressure against said cylinder, and means for adjusting said trough toward and from said cylinder to vary the thickness of the film of ink applied to said cylinder.

KARL KLINGLER. 35