Jan. 17, 1939. W. KLINE 2,143,885

INKING DEVICE FOR PRINTING PRESSES

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FIG. 1.

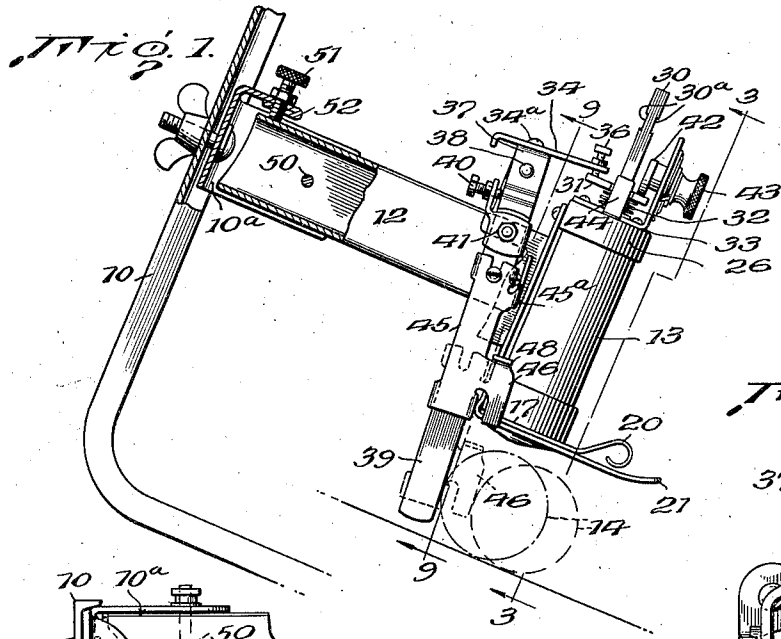


FIG. 2.

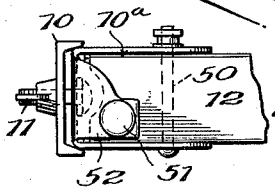


FIG. 9.

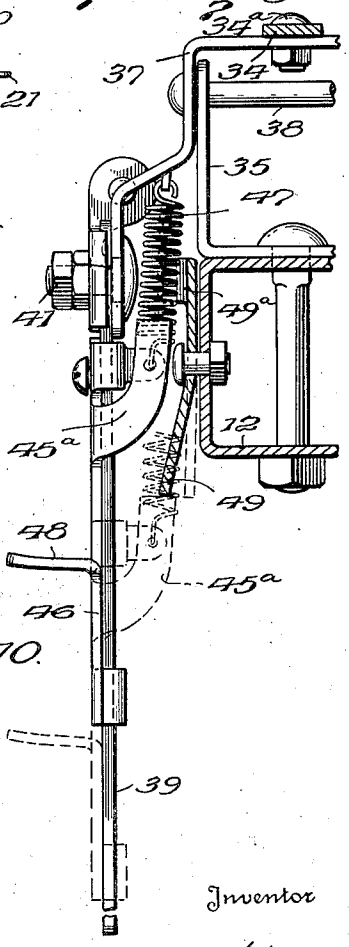


FIG. 3.

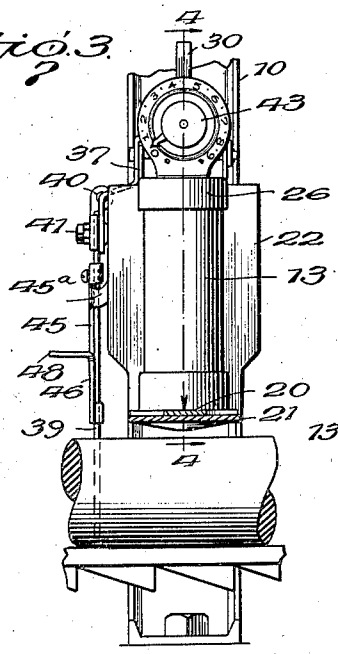


FIG. 10.

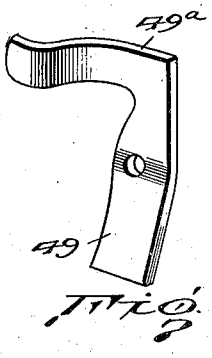
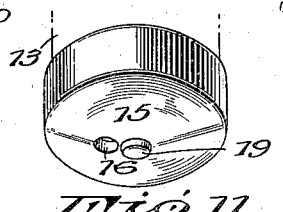


FIG. 11.



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Fig. 4

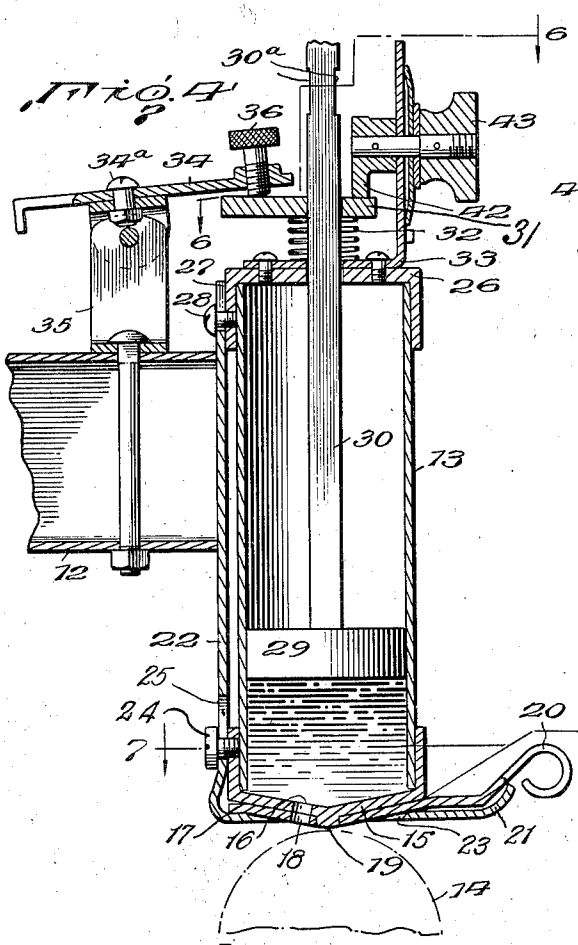


Fig. 5

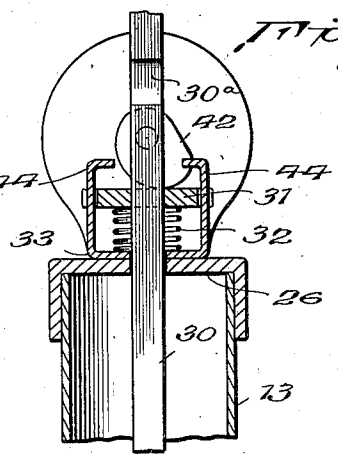


Fig. 7

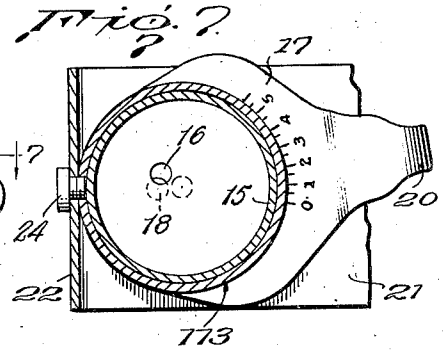
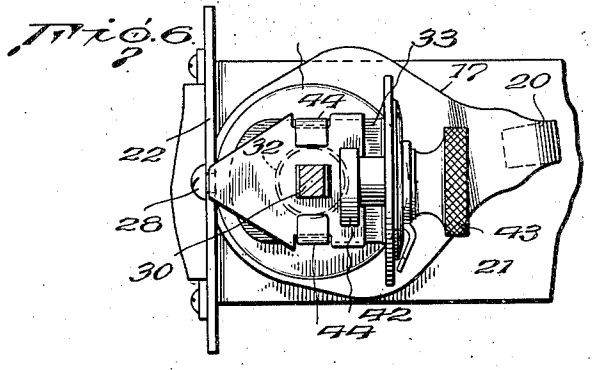


Fig. 6



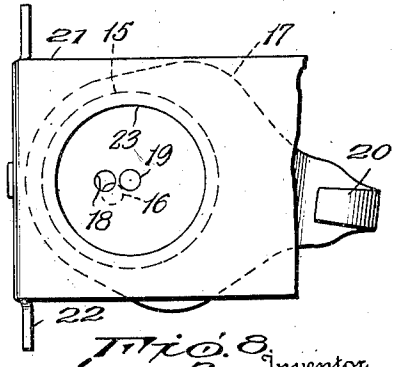


Fig. 8

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FIG. 12.

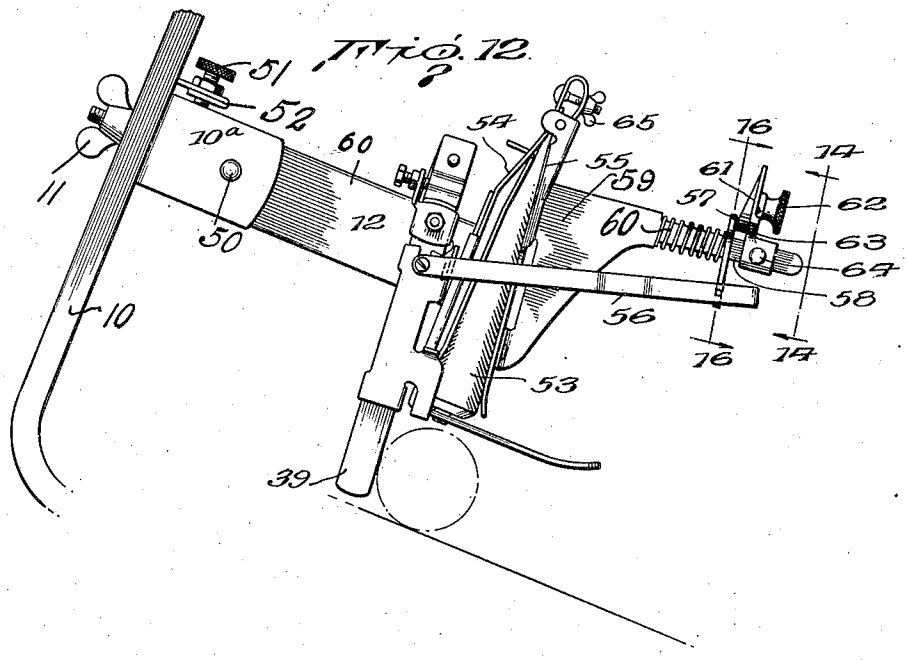


FIG. 13.

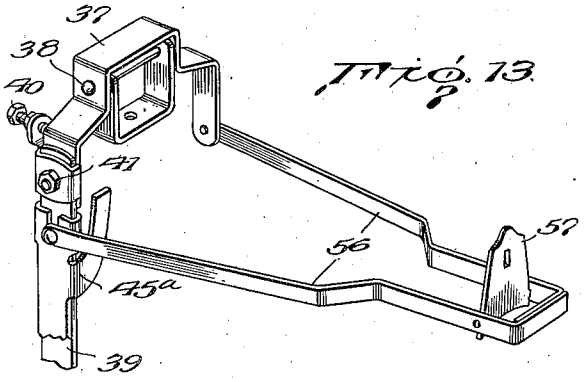


FIG. 16.

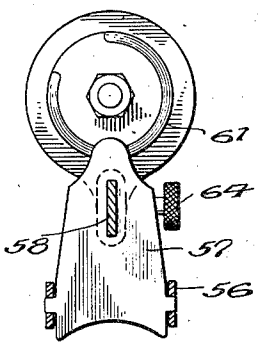


FIG. 14.

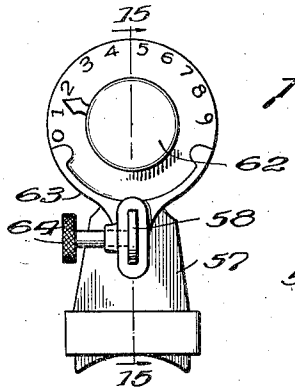
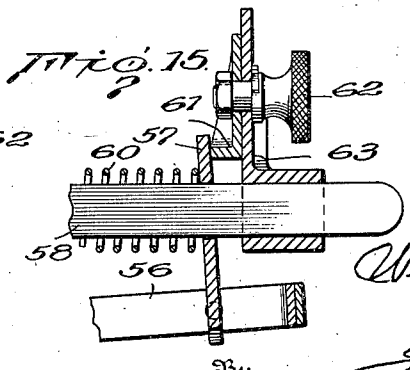


FIG. 15.



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Patented Jan. 17, 1939

2,143,885

UNITED STATES PATENT OFFICE

2,143,885

INKING DEVICE FOR PRINTING PRESSES

William Kline, Roanoke, Va.

Application December 21, 1936, Serial No. 117,067

24 Claims. (Cl. 101—366)

For good printing, there must be a proper supply of ink to the inking mechanism, so that, for platen presses, for example, just the requisite, quantity for high class, uniform impressions or imprints means be delivered by the ink rollers to the type. To secure this result, and secure it with the minimum expenditure of cost-adding time and labor, human agencies in the supply of ink to the inking mechanism must be eliminated or reduced to the minimum and as far as possible automatic, or mechanically acting devices must be employed for delivering ink from a reservoir, or source of supply, to the ink transferring instrumentalities of the press, which in platen presses, include an ink-receiving plate in the form of a rotating disk and to and fro moving composition rollers which traverse the disc and the type or form and carry a thin film of ink from disk to type. Ink-feeding mechanism, that satisfactorily achieves the ends to which I have just adverted forms the subject of my Patent No. 1,965,596, July 10, 1934, and my present invention embodies the same general characteristics of the invention of said patent, but in mechanical embodiments which more satisfactorily secure the nice supply of ink from the reservoir or source of supply and which enable the necessary adjustments or manipulations of the parts of the mechanism to be more readily and efficiently performed.

The ink reservoir or source of supply may be a compressible tube, whose walls to expel the ink, as needed, are squeezed or collapsed, by externally applied pressure, or it may be a cylinder with rigid walls, from which, by pressure suitably applied to the contained ink the latter may be expelled, and I illustrate herein, embodiments of my present invention for utilizing both these types of reservoirs or containers.

My invention consists in whatever is described by, or is included within the terms or scope of the appended claims.

In the drawings:

Fig. 1 is a side elevation, with parts in section, of an embodiment of my invention in which the ink reservoir is a solid walled cylinder, with a reciprocating piston to apply expelling pressure to the ink.

Fig. 2 is a detail top plan view of one end portion of the vertically adjustable supporting arm for ink cylinders and piston pressure producing means.

Fig. 3 is a section on line 3—3, Fig. 1.

Fig. 4 is a vertical section through the ink cylinder on line 4—4, Fig. 3.

Fig. 5 is a like view of the upper portion of the ink cylinder by taking it substantially at right angles to Fig. 4.

Fig. 6 is a horizontal section on line 6—6, Fig. 4.

Fig. 7 is a horizontal section on line 7—7, Fig. 4.

Fig. 8 is a detail, bottom plan view of the bottom of the ink cylinder.

Fig. 9 is a section on line 9—9, Fig. 1.

Fig. 10 is a detail view, in perspective of the latch for the vertically shiftable ink roller engaging slide, shown best in Fig. 9.

Fig. 11 is a detail view in perspective of the bottom of the ink cylinder.

Fig. 12 is a side elevation of an embodiment of my invention in which the ink reservoir is a collapsible tube.

Fig. 13 is a perspective view of a portion of the collapsible tube-squeezing mechanism.

Fig. 14 is a front view of the spring tension adjusting device of said squeezing mechanism.

Fig. 15 is a section on line 15—15, Fig. 14.

Fig. 16 is a section on line 16—16, Fig. 12.

I will describe, in detail, first the embodiment of my invention shown in Figs. 1 to 11.

For the convenient attachment to and support of the mechanism from the printing press, an L-shaped member 10 is provided, as in my patent above-mentioned, with a vertical arm that reaches upward at the rear edge of the ink disc. To such arm, near its upper end is secured, by a screw-clamp 11, a hollow open ended or forked bracket 19a, with parallel, vertical side walls, that are connected at the top by a cross piece 52 between which lie the rear end portion of a tubular, or hollow, forwardly projecting, downwardly inclined supporting arm 12, parallel with the upper face of the ink disc. At its forward end said arm 12 has attached to it the vertically extending ink cylinder 13, and the mechanism by which expelling pressure is produced on the contained ink for delivery of the nice amount of ink required, to the composition rollers but one of which 14, is shown in Figs. 1 and 3.

The cylinder bottom 15 is dished inward and downward to the center and near the center is the ink outlet formed by a vertical hole 16, that discharges to a rotary valve plate 17, on the outside of bottom 15, and having a vertical hole 18, adapted by turning of the valve, either to be placed wholly out of alinement with hole 16, or to be more or less out of alinement therewith, and thus either to completely cut off outflow of ink to the inking roller 14, when below it, or to

adjust the actual size of ink outlet to a close or nice degree. The valve plate is pivoted to a central stud 19, on the bottom 15, and has a radial finger or handle 20, to swing it, and a scale or index (see Fig. 7) for its accurate adjustment.

The ink cylinder is supported at the bottom by a horizontal arm 21, with which the valve plate contacts, which arm is at the lower end of a vertical bar 22, that extends alongside the cylinder from the end of the arm 12, to which it is secured. The arm 21, has a hole 23 for down flow of ink from valve hole 18, and said hole 23 is sufficiently large to receive the flaring or funnel shape, lower central portion of the valve plate. This arrangement assures a better delivery of ink to the ink rollers, and, the large hole in arm 21 will better accommodate the discharge or neck end of a collapsible ink tube which may be used in place of the cylinder 13.

The cylinder bottom 15 has an upwardly projecting flange that snugly fits about the lower end of the cylinder, and serves to attach the bottom to the cylinder, a set screw 24 passing through a vertical key-hole slot 25 in the vertical supporting bar 22, and through the flange securing detachably, the bottom to the cylinder.

The top of the cylinder is closed by a head 26, having a downwardly extending flange that fits over the upper end of the cylinder, and through which and through a vertical slot 27 at the top of the bar 22, a set screw 28, passes, to secure the head detachably to the cylinder. The vertical slots 25 and 27 are provided to allow vertical movement of the cylinder to place it in, or remove it from supporting connection with bar 22 when an empty cylinder is to be replaced by a filled one, or for other reasons cylinders are to be changed.

In exchanging cylinders, of course, the piston is taken out from the one to be removed and placed in the one then installed, the removability of the cylinder head allowing this. The detachability of the cylinder bottom enables the same bottom to be used with different cylinders.

From the piston 29 within the cylinder extends upward through the head 26, a rod 30, upon which is a spring-supported clutch plate 31, the spring 32, being placed between said plate and the cylinder head or a plate 33 secured thereto by screws, or rivets.

The clutch plate is sufficiently loose on the rod so that it may rock slightly on the rod, upon pressure applied to its upper face, eccentrically of the rod, and thus cramp or bind at its hole sides on the rod, and under continued downward pressure, will cause the piston through its rod to exert downward ink-expelling pressure on the ink below the piston. Such pressure on the clutch plate is produced by the rocking of a lever 34, pivoted to a bracket, 35, fixed to the top of arm 12, and which lever, at one end overlaps the clutch plate, and by a screw 36 has an adjustable bearing on the plate. The lever 34, has a laterally and downwardly extending arm 37 through which the lever pivot 38 passes, and to which below said pivot is bolted the upper end of a vertical bar 39 that reaches downward to a point below the ink cylinder far enough to be in the path of the forward inking roller 14, or a tracking roller, and to be swung by such roller, as it moves, and thereby rock the clutch plate engaging lever 34 in the direction to actuate the same and exert pressure on the piston to expel ink to such roller 14 for the latter will be beneath the cylinder ink outlet when it has moving contact with the lever rocking bar 39. Adjustment to properly position the lower roller contacting end of bar 39 for contact by the roller is afforded by a set screw 40 carried by the upper end of the bar 39 and engaging the edge of the lever arm 37 above the bolt 41 which connects lever arm 37 and rocking bar 39. When adjustment has been made by screw 40, bolt 41 is tightened to hold bar 39 in its adjusted position.

As lever arm 37 and bar 39 hang from the pivot at an angle, gravity acts to return the bar 39 to normal, roller-engaging position after it has been swung by the roller therefrom, and the roller recedes. Of course, a spring could be used, if desired.

The clutch plate is vertically adjustable to vary the distance between its top and the contacting end of lever 34 (screw 36), so that the latter will travel more or less before it engages and moves the clutch plate downward and thus vary the downward travel of piston 29 and change the quantity of ink fed out from the holder. If lever screw 36 engages the clutch plate immediately after the screw end of the lever moves downward, obviously there will be greater travel downward of the clutch plate and of the piston and greater feed of ink, than if, by reason of the downward adjustment of the clutch plate screw 36 does not contact with the plate until after the lever has moved a substantial distance before the screw contacts with the clutch plate. To thus adjust the clutch plate, a rotary snail cam 42 is provided that bears on the top of the plate, which cam when revolved in one direction depresses the clutch plate against the spring pressure, and when revolved in the opposite direction allows the spring to lift the clutch plate. The cam is mounted to turn in a vertical extension of plate 33, secured to the top of head 26. The cam has a turning knob 43 and an index for a scale on the face of the plate extension that serves to show the quantity of ink to be fed at various adjustments and thus provides for nice and repeated adjustments. The numerals of the scale run from 0 to 9, and with 0 at the index, the clutch plate is depressed so far that the swing of lever 34 is practically spent, or ended, before it contacts with the clutch plate and thus little or no ink be fed, while with 9 at the index, the maximum quantity of ink will be fed, as the maximum down travel of the piston will be imparted by the clutch plate acting on the piston rod.

When the clutch plate is at its highest adjustment and with swinging arm 39 at its full reach toward the approaching rollers 14, the lever set screw 36 should be adjusted to contact with the clutch plate, as that will result in causing the clutch plate to tilt and clutch the piston rod and move the latter to effect maximum ink feed. Should that maximum ink feed not take place, because the roller engaged feeding arm 39 falls short of its proper forward position for engagement by the first roller 14, then adjustment of said arm 39 to proper position can be effected by manipulation of bolt 41, and set screw 40, so that arm 39 may be swung on pivot bolt 41, as above explained.

The spring 32 pushing upward on the clutch plate rocks the lever 34 to its original position after an ink feeding movement of the piston 29, and also serves to help swing the roller-engaged lever 39 to its forward roller-engaging position when the clutch plate is at its highest adjustment. When the clutch plate is adjusted to a lower posi-

tion, the spring will act on the feeder arm 39 for a less portion of its forward swing to meet the front inking roller 14.

As best shown in Figs. 5 and 6, the clutch plate has notches in opposite edges that receive vertical guide arms 44, which, above the plate are inturned thereover to provide stops for the plate under upthrust of the spring 32.

As shown in Figs. 1, 4 and 5, notches 30a are made in the sides of piston rod 30 at a suitable height above the piston so that when thereat the clutch plate will not grip the rod when the piston has reached the cylinder bottom and thus no strain will fall on the working parts by down pressure on the piston.

Upon ink roller contacting bar 39 is a vertical slide 45, that normally is above the lower roller contacting end of bar 39 and upon the lower end of said slide is a vertical finger 46 that, when the slide is lowered is forward of the roller-engaging part of said bar 39, and in position to be engaged by the moving roller, when the latter, as shown in Fig. 1 by dotted lines, stops its travel short of a point to contact with the bar 39 and thus assures depression of the clutch plate and the piston and issue of ink to the roller when below the cylinder. This is desirable to supply ink to the disk in case the press is run when the impression is off, that is, without taking impressions, or printing, and the upward travel of the rollers over the disk is shortened.

A spring is connected at its lower end to the upper end of the slide 45 and connected at its upper end to the lever arm 37, normally holds the slide in its lifted and inactive position. By a finger 48, projecting from the slide (see Fig. 9) the slide may be pushed downward against the pull of the spring, and when the slide is in its lowest position it is locked there by a latch 49, pivoted to the side of arm 12, that may be rocked to latching position by a lateral offset 49a, forming a handle over its pivot. See Figs. 9 and 10. The latch engages the top of a finger 45a on the slide.

The spring 47, when stretched by lowering the slide, bears against the latch above its pivot, and acts to press and yieldingly hold the latch in slide-latching position as shown in full lines, Fig. 9. The latch is released from the slide, when printing is resumed because the roller 14 in its full travel presses against the slide finger, moves it from the latch, and the spring lifts the slide to normal position.

Should it be desired to stop ink feed, while printing continues, as toward the end of a run or job when there is plenty of ink on disk and rollers to finish the job, feed can be stopped by downward adjustment of the clutch plate by turning the scale to 0; or by closing the ink outlet from holder 13; or by swinging lever 34 on a pivot 34a to clear the clutch plate.

Said lever 34 is made of spring metal so as to yield in case of over-pressure upon the clutch plate in excess of pressure for proper expelling of ink from the holder 13.

Nice, or close adjustment of the position of the ink outlet at the cylinder bottom, and the roller 14 at the time ink is discharged, and the fixing or holding of such relative position are important to secure that accuracy of ink supply to the inking mechanism of the press which is the aim of my invention. To accomplish this, I pivot the arm 12 to the bracket 11 by a horizontal pivot bolt 50 (see Figs. 1 and 2), and employ a set screw 51, mounted in the cross-piece 52 on the bracket 10a, which set screw 51 bears on the top of the arm 12 to the rear of the pivot bolt 50 to act on the arm 12 for vertically adjusting the level of the ink outlet 16 in cylinder bottom maintaining such outlet at the desired level.

As shown in Fig. 2 the set screw and finger 52 are offset to one side to clear a notch in the top of arm 12 (shown in dotted lines Fig. 2) which is provided to clear head of bolt 11, when the arm 12 is swung upward on its pivot to give access to rollers and ink disc for cleaning.

Describing now what is shown in Figs. 12 to 16, it will be found that the substantial or essential difference from what is shown in Figs. 1 to 11, is in the employment of a collapsible ink tube 53, instead of the solid wall ink cylinder, and the employment of appropriate squeezing devices for such tube. The tube is placed vertically between a fixed clamp plate or jaw 54, fixed to the supporting arm 12, projecting from the bracket 10a, to which it is pivoted by a horizontal bolt, and a movable clamp or jaw 55 pivoted at its upper end to the fixed clamp, and a yoke-form link or pitman 56 (see Figs. 12 and 13), is connected at one end to the lever rocking bar 39, and at the other end engages a rockable clutch plate 57 upon the rod or shank 58 of an arm 59, projecting from jaw 55, and on the rocking of the bar 39 by impact of the inking roller therewith, the movable clamp squeezes the tube and expels the desired quantity of ink. The clutch plate bears on one side against a spring 60, and on the opposite side, for clutch plate adjustment as in Figs. 1, 3, 4 and 5, is engaged by a circular or segmental cam 61, rotatable by a knob 62, by reference to a scale and index (see Figs. 14 to 16). The cam and knob are rotatably supported by a bracket 63, that has a base slotted to pass over the shank 58, and adjustably secured thereto by a set screw 64.

A screw clamp 65 holds the tube at its upper end against the fixed jaw of the tube squeezer. See Fig. 12. The details of construction of the tube squeezing devices are not necessary to be further shown and described herein but can be learned from my copending application, Serial No. 117,066, filed concurrently herewith, and in which claims therefor are mare.

Of course, my invention may have other embodiments than those shown and described and I, therefore, do not restrict myself thereto.

The collapsible tube form of ink holder possesses certain advantages, such as convenience in handling, but there are occasions when ink in bulk is preferably used, as when remixing of the inks is required for certain jobs, and when different kinds and colors of inks are required. It is to meet these requirements that I embody my invention in forms available for the collapsible tube containers and the rigid wall cylinders. The rigid wall cylinders are especially advantageous, when different colors or kinds of ink may be required and as convenient holders for left-over inks that may be later used. Thus a number of such cylinders can be supplied with simple removable caps to close both ends of the cylinder that serve to keep the ink fresh and clean and are removed when the cylinder is installed in the feeder and is used with the special bottom with the ink outlet, or any special cap or cover, which the design of the machine requires. With some machines, no cover, or cap is required for the cylinder, so that as installed in the machine, the container is a simple, rigid wall straight tube

whose lower end only needs be closed with a cup form bottom with an appropriate ink outlet.

What I claim is:

1. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, and mechanism to subject ink in the holder to expelling pressure, including a to and fro moving bar situated to be engaged and actuated by said to and fro moving element, and a horizontal pivot suspending said bar in a substantially vertical position with its lower part in the path of said element.

2. An ink feeder for a printing press and having means to exert expelling pressure on ink in an ink holder including a movable pressure exerting device, a to and fro moving member adapted to receive motion from a moving part of the press, and clutch means to transmit motion from said member to said pressure-exerting device.

3. An ink feeder for a printing press and having means to exert expelling pressure on ink in an ink holder including a movable pressure exerting device, a to and fro moving member adapted to receive motion from a moving part of the press, and clutch means to transmit motion from said member to said pressure-exerting device, said clutch means comprising a rockable plate, and a part of the pressure exerting device on which it is rockably mounted.

4. An ink feeder for a printing press and having means to exert expelling pressure on ink in an ink holder including a movable pressure exerting device, a to and fro moving member adapted to receive motion from a moving part of the press, clutch means to transmit motion from said member to said pressure-exerting device, said clutch means including a rockable plate, a spring exerting pressure on said plate at one side thereof, and said member having rockable bearing contact with said plate on the side opposite the spring.

5. An ink feeder for a printing press and having means to exert expelling pressure on ink in an ink holder including a movable pressure exerting device, a lever of two pivoted parts, one of which is in the path of a moving part of the press, said part being adjustable on its pivotal connection with the other part, and means to transmit motion from said lever to said pressure exerting means.

6. An ink-feeder for printing presses comprising an ink-holding cylinder having an ink outlet, a support for said cylinder at the outlet end thereof, and a valve plate having an ink passing hole and situated between the cylinder and its support.

7. A printing press as in claim 2 in which the clutch means include an adjustable plate, and having plate adjusting means provided with a scale.

8. An ink feeder as in claim 2, in which the clutch means is a spring pressed plate, and having plate adjusting means.

9. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, a supporting arm to which such holder is attached that extends substantially at right angles therefrom above the inking mechanism, a press-supported frame member to which said arm is pivoted to allow swinging movement of said holder towards and from the inking means, and an adjusting and holding screw carried by said frame member and engaging said arm at a point on the opposite side of the arm pivot from the holder, and acting to restrain movement of the holder towards the inking means.

10. An ink feeder for a printing press having a press inking mechanism that includes a to and fro moving element, said feeder comprising a stationary ink supporting means, an ink container removably mounted on said supporting means, means for expelling ink from said container to said inking mechanism, a depending swingable arm mounted on said supporting means and arranged in the path of movement of said to and fro moving element of the inking mechanism to be actuated thereby and further arranged to contact said ink expelling means in at least one of its swinging movements.

11. An ink feeder for a printing press as set forth in claim 10, further characterized by said ink supporting means being movable to and away from operative position and including means for adjusting said container vertically with respect to said press inking mechanism.

12. An ink feeder for a printing press as set forth in claim 10, further characterized by means for adjusting the position of said swingable arm with respect to the to and fro moving element of the press inking means.

13. An ink feeder for a printing press as set forth in claim 10, further characterized by said pressure expelling means including a rod, and a member actuated from said swingable arm and having frictional clutching contact with the rod when said arm is operated in one direction by said to and fro moving element of the press inking mechanism.

14. An ink feeder for a printing press as set forth in claim 10, further characterized by said pressure expelling means including a rod, a member actuated from said swingable arm and having frictional clutching contact with the rod when said arm is operated in one direction by said to and fro moving element of the press inking mechanism, and means for adjusting the position of said rod clutching member with respect to said rod and said swingable arm.

15. An ink feeder for a printing press as set forth in claim 10, further characterized by said pressure expelling means comprising a pressure exerting member, a rod carried thereby, a friction clutch member slidably mounted on the rod and actuated to frictionally bind on the rod by the movement of said swingable arm in one direction, a spring means operating on said clutch member in opposition to said swingable arm, and means on the rod rendering the frictional contact of said member inoperative when a predetermined limit of movement of the pressure member has been reached.

16. An ink feeder for a printing press as set forth in claim 10, further characterized by said pressure expelling means comprising a pressure exerting member, a rod carried thereby, a friction clutch member slidably mounted on the rod and actuated to frictionally bind on the rod by the movement of said swingable arm in one direction, a spring means operating on said clutch member in opposition to said swingable arm.

17. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, and mechanism to subject ink in the holder to

expelling pressure, including a to and fro moving member situated to be engaged and actuated by said to and fro moving element, and means suspending said member in a substantially vertical position with its lower part in the path of said element, said to and fro moving member having two alternately usable bearing parts for contact with the to and fro moving element, one of which is normally in a non-contacting position.

18. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, and mechanism to subject ink in the holder to expelling pressure, including a to and fro moving member situated to be engaged and actuated by said to and fro moving element, and means suspending said member in a substantially vertical position with its lower part in the path of said element, said to and fro moving member being a bar that carries a slide with a bearing that is shiftable to and from position in the path of the to and fro moving element.

19. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, and mechanism to subject ink in the holder to expelling pressure, including a to and fro moving member situated to be engaged and actuated by said to and fro moving element, and means suspending said member in a substantially vertical position with its lower part in the path of said element, said to and fro moving member being a bar that carries a slide with a bearing that is shiftable to and from position in the path of the to and fro moving element, and a spring holding said slide normally out of said path.

20. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, and mechanism to subject ink in the holder to expelling pressure, including a to and fro moving member situated to be engaged and actuated by said to and fro moving element, and means suspending said member in a substantially vertical position with its lower part in the path of said element, said to and fro moving member being a bar that carries a slide with a bearing that is shiftable to and from position in the path of the to and fro moving element, a spring holding said slide normally out of said path and a latch to hold said slide in said path against the pull of the spring.

21. An ink feeder for a printing press having an inking mechanism that includes a to and fro moving element, said feeder comprising an ink holder with an outlet for ink to the inking means, and mechanism to subject ink in the holder to expelling pressure, including a to and fro moving member situated to be engaged and actuated by said to and fro moving element, and means suspending said member in a substantially vertical position with its lower part in the path of said element, said to and fro moving member being a bar that carries a slide with a bearing that is shiftable to and from position in the path of the to and fro moving element, a spring holding said slide normally out of said path and a latch to hold said slide in said path against the pull of the spring, said spring situated to exert pressure on the latch to hold it in latching position.

22. An ink feeder as in claim 6, wherein the support has an enlarged opening at the outlet end of the cylinder and said valve plate has a dished portion extending into said enlarged opening and is rotatable with respect to the outlet end of said cylinder whereby the discharge of ink may be varied.

23. An ink feeder for printing presses as set forth in claim 6 wherein the ink holding cylinder is removable from its support and is provided with a detachable bottom having an ink outlet, and means detachably holding the cylinder in working position.

24. An ink feeder for printing presses, comprising an ink-holding cylinder having an ink outlet and having a removable head-cap, a piston within the cylinder having a reciprocable rod passing through said head-cap means to apply pressure to the rod, a support for the cylinder with which it is detachably connected, and pressure regulating means supported on said head-cap, the outlet of said cylinder being in a removable bottom, a valve plate having an ink passing hole therein to cooperate with said cylinder outlet, whereby the ink discharged therefrom may be shut off or regulated.

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