Oct. 18, 1932. P. J. CLARK 1,883,572

INKING DEVICE FOR PRINTING MACHINES

Filed May 9, 1930 3 Sheets-Sheet 1

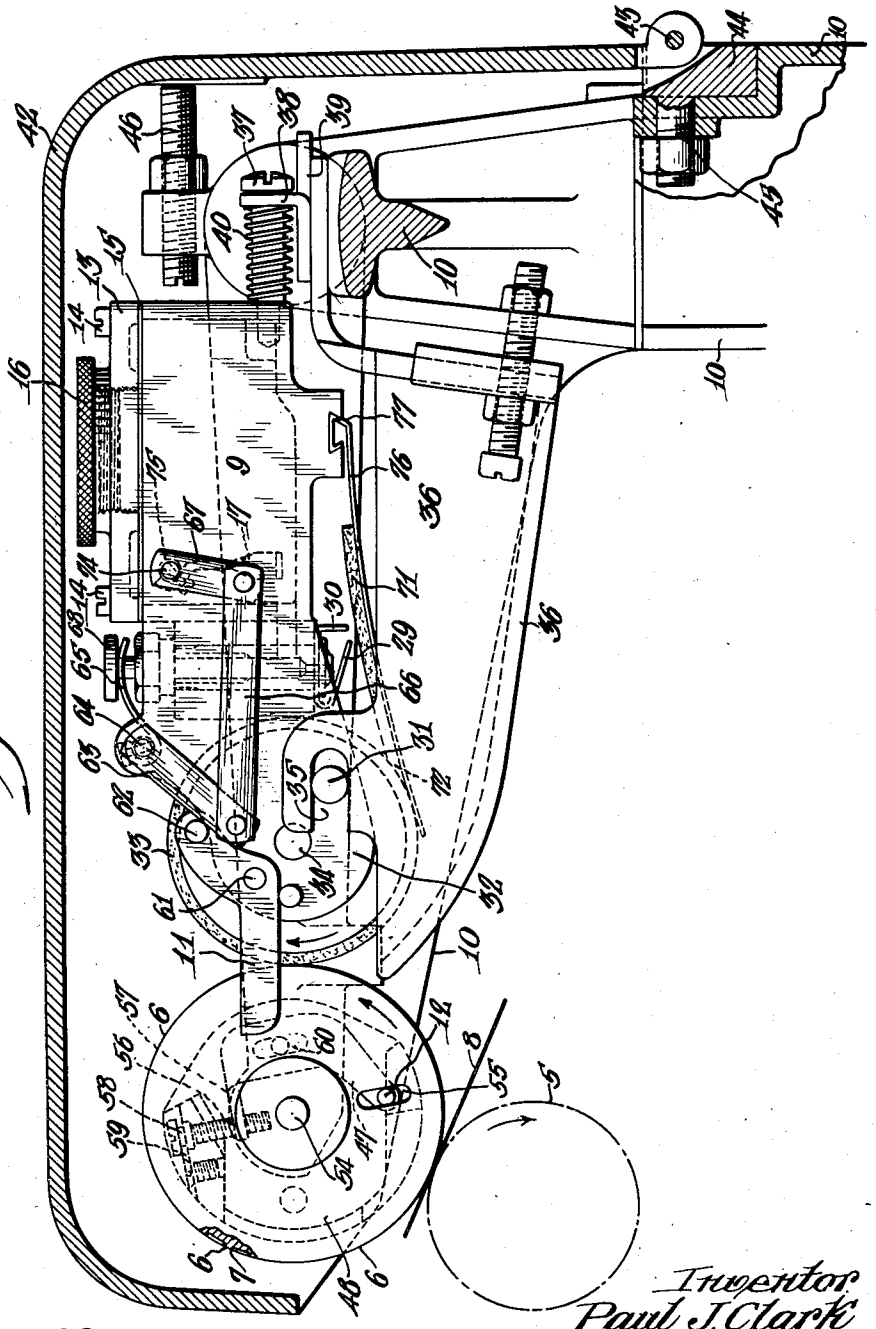


Fig. 1.

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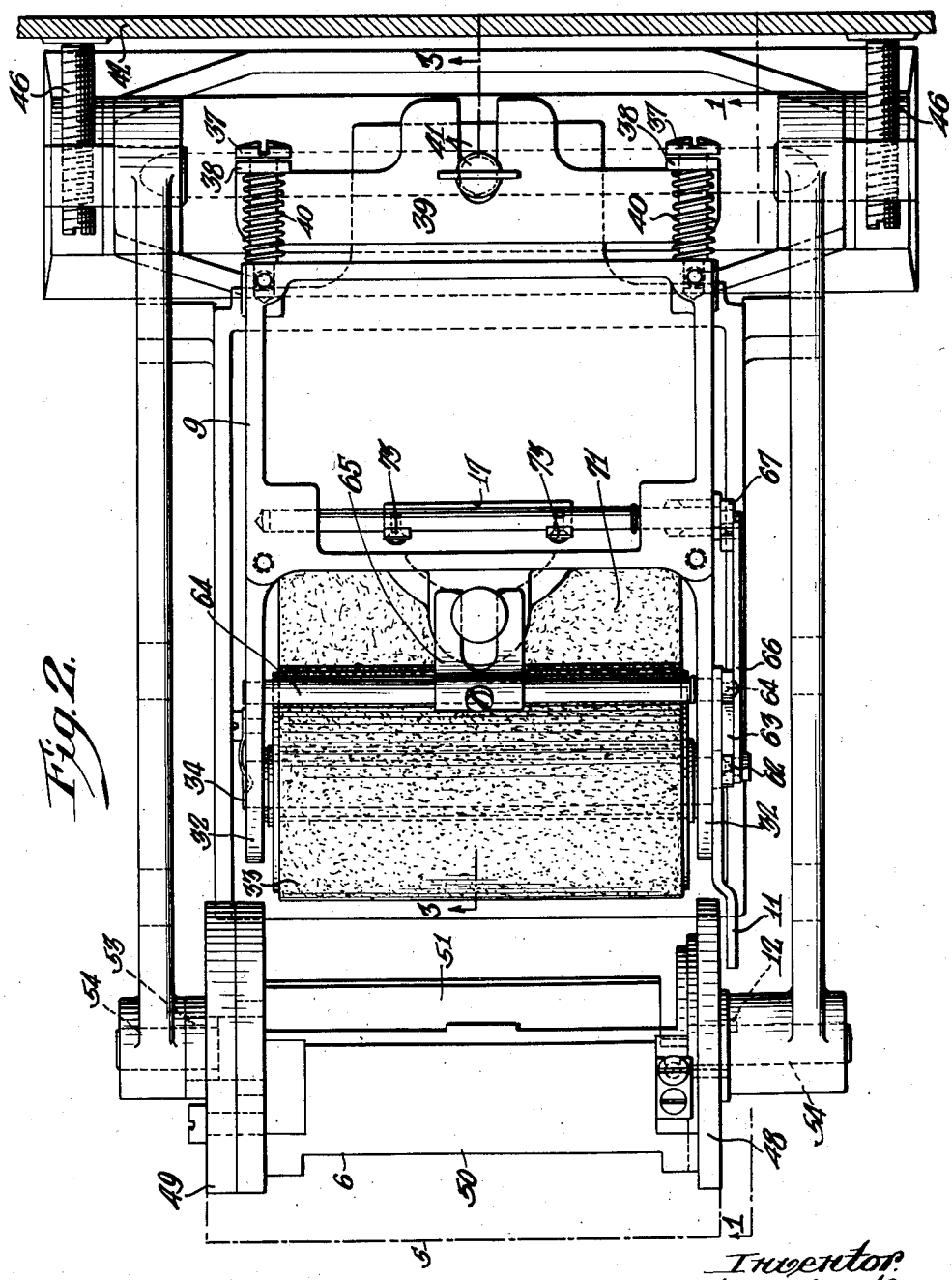


Fig. 2.

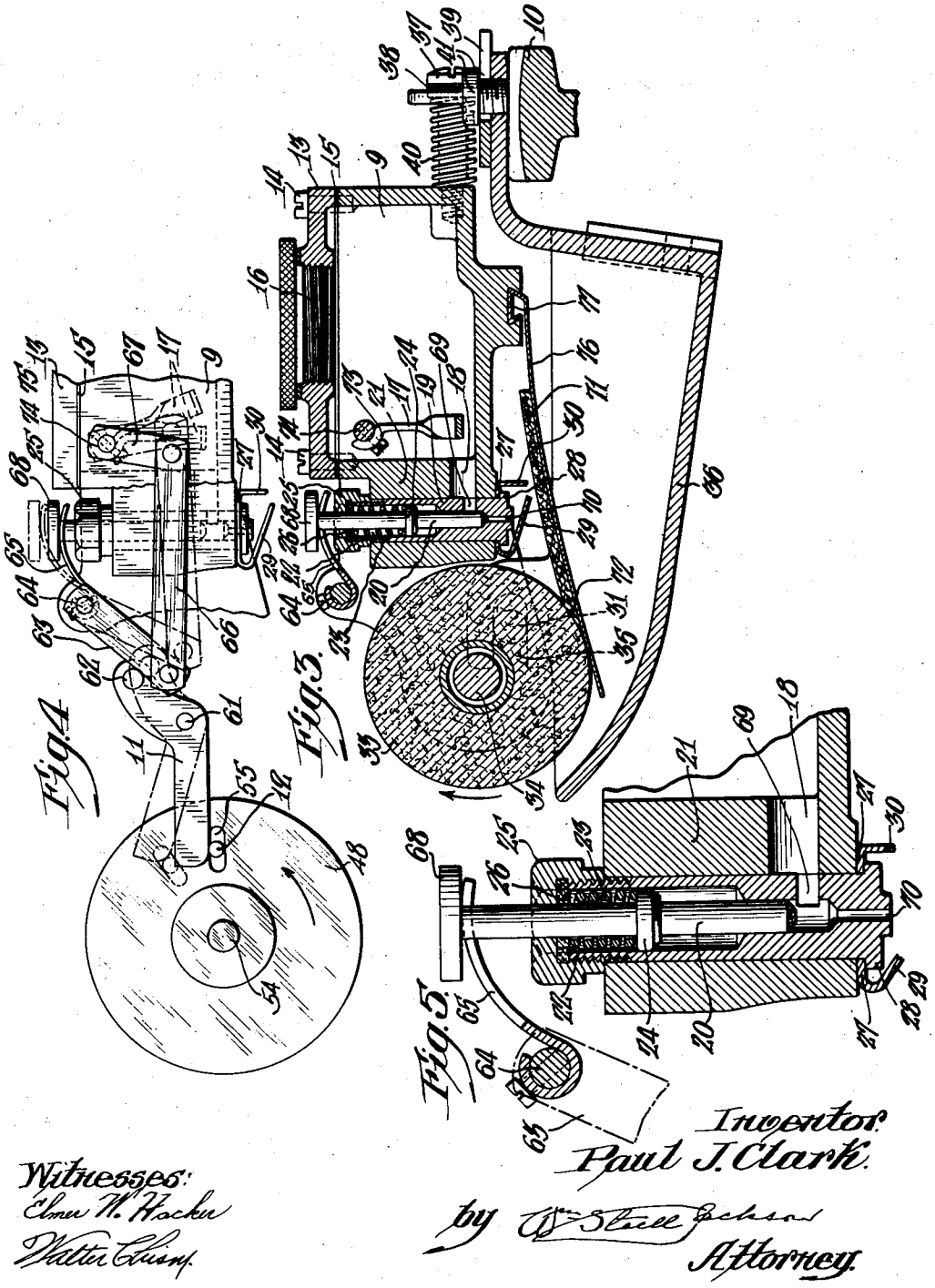
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INKING DEVICE FOR PRINTING MACHINES

Filed May 9, 1930. 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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INKING DEVICE FOR PRINTING MACHINES

Application filed May 9, 1930. Serial No. 450,921.

My invention relates to an inking device for use in automatically inking the type of rotary printing machines such as that disclosed and claimed in my U. S. Patent No. 1,709,897, entitled "Check endorsing machine", issued April 23, 1929.

The subject matter of the present invention is to some extent a development of that of my above patent, its widest application being perhaps in inking the printing (type carrier) rolls of the kind described in this patent. However I may apply my device to any rotary printing machine to which it may be applicable.

A purpose of my invention is to provide novel means for inking a printing roll during the operation of the roll that is well adapted to the needs of service and easy and inexpensive to manufacture.

A further purpose is to provide a machine of the type indicated that will hold ink in a sealed reservoir so that the machine may be handled without danger of spilling ink or of having it feed ink inadvertently.

A further purpose is to provide novel means adapting each rotation of a printing roll to effect a feed of ink for ultimate transmission to the type of the roll.

A further purpose is to operate an ink feed pump for a printing roll by the cooperating action of a spring retracted rocker axially offset from the roll and a longitudinal projection (preferably radially adjustable) upon the end of the roll, presenting an arm of the rocker in the path of the projection and using the deflection of the arm by the projection and its spring retraction to effect a feed of ink once during each rotation of the roll.

A further purpose is to feed ink for a printing roll by means of a plunger pump spring pressed toward closure and to provide an operating connection between the end of the roll and the pump adapting the pump to be retracted once during each rotation of the roll and then to effect a spring return for feeding the ink.

A further purpose is to provide novel means for easily adjusting the feed of ink to a printing roll from a closed reservoir.

A further purpose is to effect a stirring of the ink within a feed reservoir for supplying ink to a printing roll once during each rotation of the roll.

A further purpose is to deliver ink from an ink reservoir to an absorption pad, desirably felt, distributing the ink over the pad by absorption, and to transmit the ink from the pad to a printing roll by means of an ink applying roll engaging both the pad and printing roll and preferably also covered with an absorbing material such as felt.

A further purpose is to effect a splash feed of ink to an absorbing pad for subsequent delivery to a printing roll, the splash of the feed lessening the requisite pad extension to secure uniformity of ink distribution.

Further purposes will appear in the specification and in the claims.

I have elected to show one form only of my invention, showing it applied to mechanism of a check endorsing machine, disclosed and claimed in my patent above referred to and omitting parts of said mechanism irrelevant to the present invention.

Figure 1 is a side elevation, partly in section, of structure embodying a desirable form of my invention.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a fragmentary vertical section taken upon the line 3—3 of Figure 2.

Figure 4 is a view corresponding to a portion of Figure 1 but showing the parts in different position, the parts in full line being in position at which an end projection from the printing roll is about to engage a rocker member for effecting the feeding and stirring of the ink and the same parts in dot-and-dash lines showing the parts in position just before the rocker is released from the printing roll for spring retraction.

Figure 5 is an enlarged fragment of Figure 3 with the parts in different position from that of Figure 3, corresponding to the dot-and-dash position of Figure 4.

Like numerals refer to like parts in all figures.

Describing in illustration and not in limitation and referring to the drawings:—

The illustration represents my inking de-

vice embodied upon a machine for endorsing checks, the main machine with the exception of a portion of the framework and the platen and type carrier cylinder or printing roll not being shown but disclosed and described in the patent above referred to, this patent however illustrating a different form of inking device intended to be replaced by the mechanism of the present invention.

In machines of this type the checks or other workpieces that are to receive duplicate impressions are fed successively between a platen 5 and a printing roll (type carrier cylinder) 6, the feeding of each check or other workpiece (hereafter called paper) throwing in mechanism for effecting a single rotation of the roll 6 and thereby a printing engagement of its type 7 with the paper 8 as the type and paper simultaneously pass the platen, the platen and printing roll 6 being suitably resiliently pressed together.

The present invention provides novel means whereby each rotation of the printing roll 6, effected each time a paper is fed between the platen and cylinder, effects a feed of ink out of a closed ink reservoir 9 for ultimate transfer to the printing roll and also effects a stirring of the ink within the reservoir.

The casing of the main machine is shown at 10 and gives suitable journal support to the platen 5 and the printing roll 6.

My inking unit includes the ink reservoir 9, a pump for discharging ink from the reservoir, a stirrer for keeping the ink within the reservoir stirred, a spring retracted rocker 11 for operating the pump and the stirrer and a member 12 projecting from the end of the printing roll for deflecting the rocker for spring return once during each rotation of the roll 6.

The unit also includes means for transferring the ink discharged by the pump to the printing roll in a state of proper distribution to give clean impressions, the ink transfer means comprising a splash plate beneath the discharge port of the pump, a forwardly downwardly sloping absorbent pad and an ink transfer roll in contact with the pad and with the printing roll.

The reservoir 9 is closed at the top by a movable cover plate 13 shown held to place by screws 14 and sealed by a suitable gasket 15.

The cover plate 13 is provided with a screw stopper 16, the reservoir being normally filled with ink at this stopper, while the removable plate 13 provides, in case of need, easy access to the stirrer 17 inside the reservoir and also to the ink passage 18 connecting the bottom of the reservoir interior to the cylinder 19 of the plunger pump 20.

The cylinder 19 of the ink feed pump, mounted in a vertical bore through the suitably thickened forward wall 21 of the reservoir, is counterbored at 22 to receive a spring 23 which strongly retracts the plunger to closed position, being compressed between a flange 24 of the plunger and a gland nut member 25 that threads the upper end of the cylinder while loosely surrounding the upper end of the plunger.

The flange 24 of the plunger fits the counterbore of the cylinder.

A soft washer 26 between the nut 25 and the upwardly directed end of the cylinder gives a tight seal around the plunger insuring against any outward seepage of ink and at the same time permits pressure engagement between the bottom of the nut and the casing structure 21.

A plate 27 surrounds the lower end of the cylinder above a cylinder flange 28, being clamped to place between the flange 28 and the bottom of the structure 21. This plate is extended at its forward and rearward sides to form a splash member, its forward extension 29 being bent to slope downwardly and rearwardly and the rearward extension 30 bent vertically downwardly.

The ink unit has a horizontal slide connection with the casing structure of the main machine, outwardly extending pins 31 from the side members 32 that journal the ink transfer roll 33 at 34 seating in horizontal slots 35 presented by the upward extensions from the forward portion of a stationary basin 36 underneath the unit.

At its rearward end the unit carries rearwardly extending laterally spaced screw pins 37 which are rearwardly loosely surrounded by perforated stationary ears 38 being adapted to slide rearwardly and forwardly with respect to these ears which are in turn carried on a stationary plate 39.

Springs 40 around the pins 37 press the ink unit forwardly, the forward movement being stopped during one portion of each rotation of the printing roll 6 by the engagement between the ink transfer roll 33 and a portion of the printing roll carrying the type 7 and during another portion of each rotation by the heads of the screw pins 37 coming against the ears 38.

The stationary plate 39 has an adjustable slot and screw connection at 41 with stationary structure of the main machine.

I show the ink unit provided with a cover 42 which is hinged at 43 to a transverse bar 44 that is bolted at 45 to the casing of the main machine.

Laterally spaced forwardly and rearwardly extending screws 46, mounted in the stationary structure of the machine determine the forward position of the cover.

The basin 36 is normally empty but in the event that the ink feed has been set too high there may be drippings of excess ink, the basin then catching such drippings, the basin in normal operation however being empty.

The printing is normally provided with type 7 adapted to print against the platen during each revolution of the cylinder.

The mechanism of the type being irrelevant to the present invention has not been described, one such mechanism however is described in detail in the patent above referred to.

On one end of the printing roll 6 I provide a member 47 which presents the projection 12 that once during each revolution of the roll 6 engages the forward end of the rocker 11 for operating the ink feed and the ink stirring.

The illustrated printing roll as described in the patent above referred to includes cylindrical ends 48 and 49 and intermediate arcuate portions 50 and 51, the type 7 being removably mounted upon structure intermediate the arcuate portions 50 and 51.

There is normally an open space between arcuate roll portions 50 and 51 that gives easy access to the inner sides of the end portions 48 and 49, which are centrally perforated to receive bearings 53 for the spindle 54 upon which the roll turns.

I provide the cylindrical end 48 with a radial slot 55 which passes the projection 12 from the body portion of the member 47.

The body of the operating member 47 desirably lies flat against the inside of the cylinder end 48 with the projection 12 and an adjustment screw 56 alining with the slot 55 on opposite sides of the roll axis, the screw 56 threading an inwardly turned ear 57 of the member 47 and journaling at 58 in the body of the roll without freedom of longitudinal movement.

In the illustration an arcuate surface of a plate 59 fixed to the roll locks the screw from longitudinal movement by fitting at 58 into a circumferential groove of the screw.

The portion of the member 47 between the screw 56 and the projection 12 is given a suitably arcuate form in order to avoid the central shaft of the roll, and is provided with a slot and screw connection 60 with the inside of the cylinder end, the slot at 60 being substantially parallel to the radial slot 55.

It will be seen that the arrangement permits easy adjustment of the radial position of the projection 12.

In practice when used for endorsing checks with the same endorsement repeated on successive checks there will be normally little or no occasion for any change in the adjustment of the screw 56, but if the type 7 is changed and by reason thereof each printing operation requires a different quantity of ink, then it is desirable to make suitable adjustment in the radial position of the projecting member 12, this adjustment being effected by loosening the screw at 60 and then adjusting the screw 56 until the projection is in the desired radial position after which the set screw at 60 is again tightened.

During each rotation of the cylinder the member 12 projecting from the radial slot 55 engages the end of the rocker 11 which is pivoted at 61 upon side structure of the ink unit and presents a pin 62 against the surface of a second rocker 63.

This second rocker operates the ink plunger 20 and the ink stirrer 17, being rigidly fastened to a pivot pin 64 journaling in the side structure of the ink unit and carrying a curved arm 65 for operating the ink plunger and having a link connection 66 with a rocker 67 in rigid connection with the stirrer.

The curved arm 65 is bifurcated to engage the under side of the plunger head 68 on both sides of the body of the plunger 20, being preferably convexly curved upward as indicated in the figures.

The cylinder 19 of the ink feed plunger 20 is provided with inlet and outlet ports 69 and 70, the inlet port 69 connecting through the passage 18 with the interior of the ink reservoir 9 and the outlet port 70 being very small and directed downwardly toward the splash plate 29.

The ink is discharged from the port 70 at high velocity, splashing when it strikes the sloping plate 29 and spreading to considerable distance laterally before it drips down upon a pad 71.

The pad 71 slopes forwardly and downwardly and is preferably of absorbent material, desirably felt whereby the ink becomes distributed over the full width of the felt by the time it soaks down to the forward edge 72 where it is engaged by the transfer roll 33 which carries the ink from the pad to the type on the carrier cylinder 6.

Desirably both the pad and the roll 33 include an outer portion of felt or other absorbent material which I find secures a very even distribution of ink by the time it reaches the type on the printing roll 6.

The stirrer 17 comprises a paddle member that extends for any desired distance across the width of the ink reservoir and is mounted by spaced arms 73 upon the shaft 74.

One end of the shaft 74 is mounted in a bearing 75 that does not extend to the outside of the casing while the other end extends through the casing and carries the downwardly extending arm 67 which has the link connection 66 with the rocker 63.

The ink feed and ink stirring mechanisms are thus connected together, both operated by the rocker 63 which is in turn operated by the rocker 11.

When the type carrier cylinder 6 rotates the projection 12 engages the inner end of the rocker 11 which moves the rocker 63 against the action of the spring 23 of the ink feed plunger to raise the plunger 20 and to

forwardly move the ink paddle 17 in the ink reservoir.

As soon as the projection 12 on the carrier cylinder runs past the end of the rocker member 11 the rocker springs back by reason of the retraction of the spring 23, Figure 3, sending the plunger 20 down with a quick movement and effecting a quick discharge of whatever amount of ink has passed into the space below the plunger and also effecting a quick stirring movement inside the ink reservoir that is adequate to maintain the ink properly stirred.

The ink feed is regulated by adjustment of the screw 56 which varies both the duration and the extent of the vertical retraction of the ink plunger.

The absorbing pad 71 under the ink delivery pump is mounted upon a piece of sheet metal 76 which is provided with a dovetail connection 77 across the bottom of the reservoir as best seen in Figures 1 and 3.

In operation the platen and carrier cylinder rotate each time a check or other workpiece is fed between them, the rotation of the carrier cylinder effecting printing upon the paper by pressing down against the platen.

During the rotation of the carrier the projection 12 engages and upwardly deflects the rocker 11 which in turn rearwardly deflects the rocker 63 operatively connected to the ink feed plunger and to the ink stirrer.

When the projection 12 runs beyond the end of the rocker 11 the spring 23 effects sudden retraction of the rocker 63 and thereby of the rockers 67 and 11, feeding ink to the splash plate and effecting a stirring of the ink within the reservoir.

The ink in its discharge from the plunger pump splashes over the absorbing pad, and the splashing effects an initial spreading of the ink that permits a smaller pad than would otherwise be necessary.

The pad distributes the ink so that by the time the ink through a combined process of absorption and gravitation reaches the lower edge of the pad, it is distributed with a substantial uniformity.

At the lower edge of the pad the ink is picked up by the felt covered ink transfer roll 11 which is in resilient engagement with the type carrier cylinder during the portion of each rotation that presents the arcuate type carrying portions of the cylinder toward the roll 11, the whole ink unit being spring pressed forwardly at 40 and stopped from forward movement by its engagement with the type carrying portion of the carrier cylinder during one portion of each rotation, and at other times by the heads 79 of the screw pins 37 coming against the stationary ears 38.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a device of the character indicated, a type carrier roll, a reservoir for ink, a pump adapted to discharge ink from the reservoir, a stirrer adapted to stir the ink within the reservoir, operative connections between the roll and stirrer and pump, and means for transferring the ink discharged by the pump to the type on the roll.

2. In mechanism of the character indicated, a type carrier cylinder, an off-center end projection therefrom, a rocker adapted to be engaged and deflected by the projection once during each rotation of the cylinder, a sealed ink reservoir, a pump adapted to discharge ink out of the reservoir, means for transferring the discharged ink to the type and operative connections between the rocker and the pump adapting each rotation of the cylinder to effect a feed of ink out of the reservoir by deflecting the rocker.

3. In mechanism of the character indicated, a type carrier cylinder, a closed ink reservoir, a pump having an inlet connection with the reservoir and a discharge outlet, a spring normally pressing the pump into a position at which it relatively seals the inlet and outlet, means for transferring the discharged ink to the cylinder and operative connections between the cylinder and pump adapting each rotation of the cylinder to effect a retraction and release of the pump, the spring at said release returning the pump to its normal position.

4. In a device of the character indicated, a type carrier cylinder, a downwardly sloping absorbent pad, means for delivering a feed of ink on to the absorbent pad on a relatively high portion thereof and a transfer roll simultaneously engaging the lower edge of the pad and the carrier cylinder.

5. In a device of the character indicated, a type carrier cylinder, an absorbent pad, means for delivering a feed of ink on to the pad and a transfer roll having an absorbent cover in position to simultaneously engage the pad at a point distant from that at which it receives the feed of ink and engaging the cylinder.

6. In a device of the character indicated, a type carrier cylinder, a downwardly sloping absorbent pad, means for delivering a feed of ink on to a relatively high portion of the pad and a transfer roll having an absorbent surface simultaneously presented to the pad and cylinder and operating during the operation of the cylinder.

7. In a device of the character indicated, a type carrier cylinder, an absorbent pad, means for delivering a splash feed of ink on to one portion of the pad, a transfer roll having an absorbent face simultaneously engaging the pad at a portion thereof distant from the said first portion and engaging the cylinder and means for operating and for adjusting the extent of the splash feed.

8. In a device of the character indicated, a type carrier cylinder, an absorbent pad, an ink supply reservoir, a spring-operated pump adapted to deliver a feed of ink out of the reservoir on to the pad, means for retracting the pump, an adjustment for the extent of retraction, operative connection between the pump and cylinder and a transfer roll simultaneously engaging the pad and cylinder.

9. In a device of the character indicated, a type carrier cylinder, a sloping absorbent pad, a plunger pump, an ink supply reservoir, conduit connection out of the reservoir normally closed by the pump, a spring pressing the pump into the closed position, operative means connecting the cylinder and pump adapted to move the pump into position to open the feed conduit connection and to release the pump for spring closure thereof in order to discharge a feed of ink out of the reservoir on to the pad and a transfer roll simultaneously engaging a low portion of the pad and the cylinder.

10. A vertical cylinder having a flange and a downward discharge port at its lower end, a plate surrounding the cylinder above the flange and bent downwardly and rearwardly across and below the discharge port on one side and downwardly on the other, a casing structure bored to receive the cylinder, an ink reservoir, having a connection into the cylinder, a plunger pump operating in the cylinder, a spring pressing the pump into position to relatively seal the connection from the reservoir and the discharge port, a type-carrying cylinder, a rocker adapted during deflection to retract the plunger, a projection from the end of the type cylinder adapted to engage and deflect the rocker during each rotation of the cylinder and means for transferring the discharged ink.

11. In a device of the character stated, an ink reservoir, a plunger pump having a portion of its stroke in communication with the reservoir, a spring pressing the pump to discharge position, a train of feed from the pump including a cylinder, a printing cylinder engaged thereby, a projection carried upon one of the cylinders adapted to retract the spring of the plunger pump and means for adjusting the position of the projection to vary the feed.

12. In a device of the character stated, a reservoir, a plunger pump adapted to discharge a jet therefrom, spring means for pressing the pump to discharge position, a pad upon which the discharge is received, a cylinder taking up the feed from the pad, a second cylinder engaging the first cylinder, a projection on one of the cylinders, a lever system engaged by the projection to retract the spring of the plunger pump and means for adjusting the radial position of the projection to vary the extent of retraction.

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