

June 1, 1943.

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2,320,698

INKING DEVICE FOR PRINTING APPARATUS

Filed Feb. 5, 1941

2 Sheets-Sheet 1

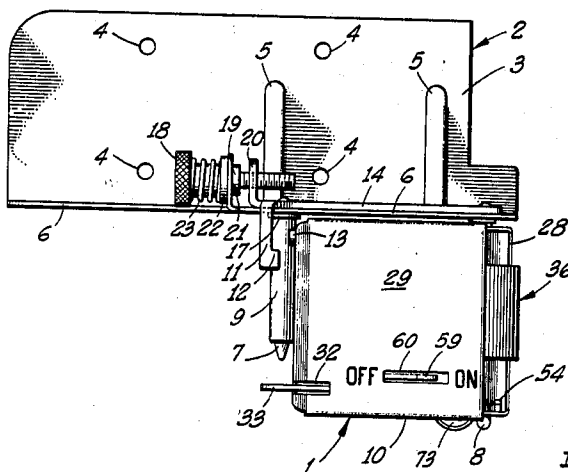


Fig. 1.

Fig. 2.

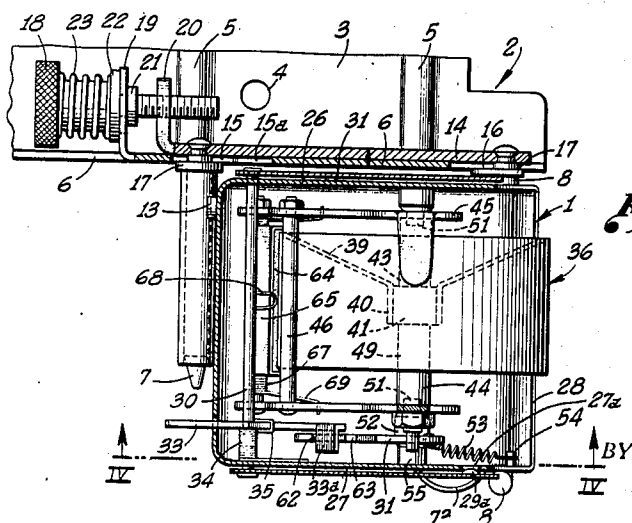
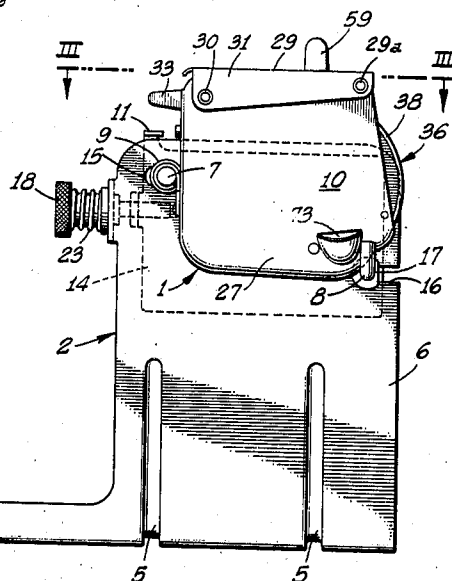


Fig. 3.

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2 Sheets-Sheet 2

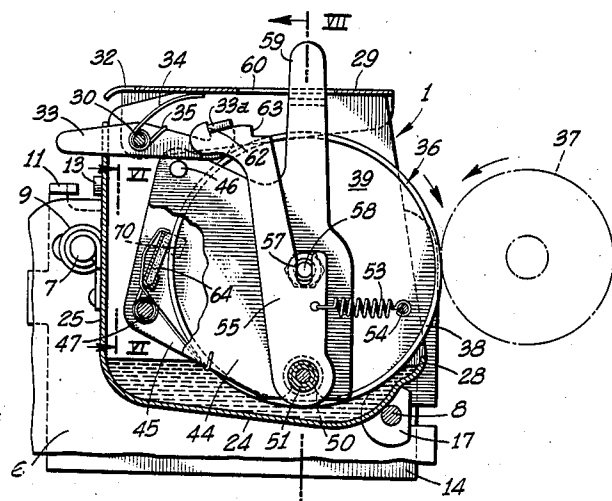


Fig. 4.

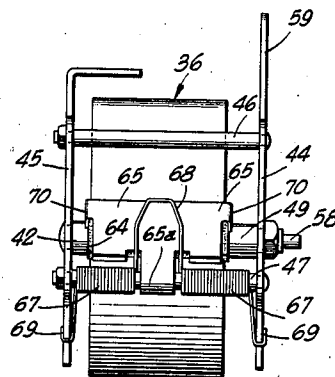


Fig. 6.

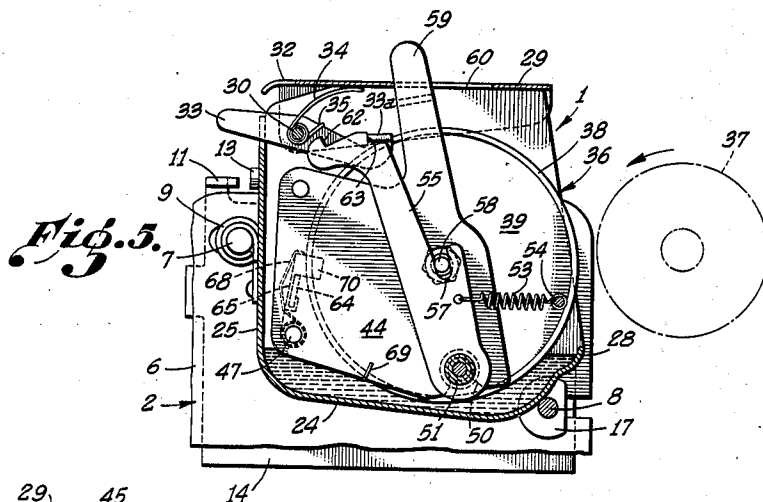


Fig. 5.

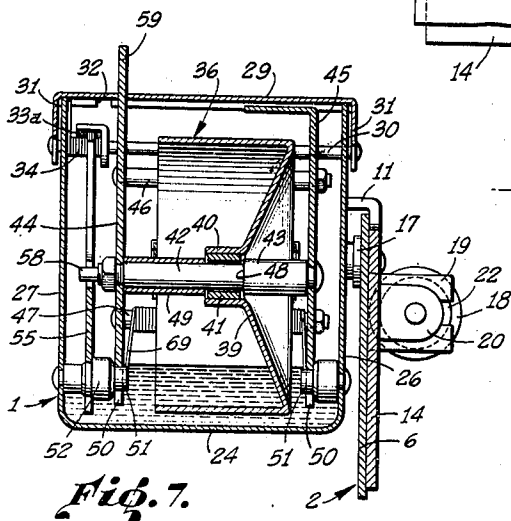


Fig. 7.

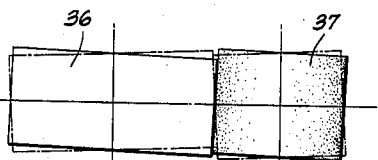


Fig. 8.

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INKING DEVICE FOR PRINTING APPARATUS

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Application February 5, 1941, Serial No. 377,420

12 Claims. (Cl. 101—363)

This invention relates to printing apparatus of the general type in which ink is transferred by means of rollers from an inkwell to a printing face, and is particularly useful in small printing devices such as, for example, postage printing machines for stamping postage on envelopes, and the like.

An object of the invention is to provide a particularly simple, inexpensive and practicable apparatus for containing a supply of ink and feeding it to an inking roller from which it may be transferred, either directly or indirectly to a printing surface.

Another object is to provide an inking device in which the amount of ink fed can be easily and accurately adjusted, and which can be easily dismantled for cleaning and servicing.

Other more specific objects and features of the invention will become apparent from the detailed description to follow of a preferred embodiment of the invention illustrated in the drawings, in which

Fig. 1 is a plan view of the device;

Fig. 2 is a side elevation;

Fig. 3 is a horizontal section taken in the plane III—III of Fig. 2;

Fig. 4 is a vertical section taken in the plane IV—IV of Fig. 3;

Fig. 5 is a vertical section, similar to Fig. 4, but showing the apparatus in a different position of operation;

Fig. 6 is an elevation of the inner assembly of the device, removed from the casing, the direction from which the view is taken being indicated by the arrows VI—VI of Fig. 4;

Fig. 7 is a vertical section taken in the plane VII—VII of Fig. 4; and

Fig. 8 is a schematic sketch illustrating the rocking movement of the inking rollers.

Referring to Figs. 1 and 2 of the drawings, the device includes an ink reservoir 1 detachably mounted on a frame 2, the latter being adapted to be supported in any suitable manner on the frame of the printing machine with which the inking device is to be employed.

The frame 2 comprises a horizontal base plate 3 having apertures 4 therein for mounting screws and having stiffening corrugations 5 formed therein. Formed integrally with the plate 3 and extending upwardly therefrom at one edge is a vertical plate 6 having a pair of pins 7 and 8 extending horizontally therefrom for supporting the ink reservoir 1. The latter has a ferrule 9 secured to its rear wall, which engages the pin 7 substantially throughout its length. The pin 8

merely engages against the underside of the ink reservoir, and supports it against downward rotation about the pin 7. The pin 8 preferably has its outer end upturned to engage the outer wall 10 of the reservoir 1 and prevent the reservoir from sliding outwardly along the supporting pins. However, the reservoir may be readily removed from the pins by first rocking it counter-clockwise (with reference to Fig. 2) about the pin 7 to carry it clear of the upturned end of the pin 8, and then pulling the reservoir away from the wall 6 so that the ferrule 9 slides off the pin 7. To limit counter-clockwise rocking movement of the reservoir to an angle insufficient to permit spilling of ink from the reservoir, a stop arm 11 is provided above the pin 7. This stop arm has a hook shoulder 12 at its outer end adapted to engage against a pin 13 in the rear wall of the ink reservoir if attempt is made to remove the reservoir while it is rocked too far counter-clockwise.

To permit forward and rearward adjustment movement of the reservoir with respect to the frame 2, for a purpose to be explained later, the supporting pins 7 and 8 and the stop arm 11 are adjustably mounted on the vertical plate 6. Thus they are rigidly secured to a plate 14 which lies against and is positioned on the opposite side of the wall 6 from the ink reservoir and is slidably secured against the plate 6 by the pins 7 and 8. Thus the latter pins project through slots 15 and 16 (Fig. 3) in the wall 6 and have flanges 17 formed thereon which bear against the plate 6. To facilitate assembly, the slot 15 is a keyhole slot having an enlarged portion 15a at its right end (with reference to Fig. 2) and the slot 16 extends clear to the right edge of the plate 6. It follows that the assembly, including the plate 14 and the pins 7 and 8, may be removed from the vertical plate 6 by first removing the ink reservoir 1 and then moving the plate 14 to the right until the shoulder 17 on pin 7 is in registration with the large end 15a of the keyhole slot 15, whereupon the flange can be passed through the keyhole slot and the whole assembly removed from the vertical plate 6.

Delicate adjusting movement of the plate 14 fore and aft may be accomplished by rotating a thumbscrew 18 which is rotatably supported in a slotted ear 19 bent out from the plate 6 and threadedly engages an ear 20 bent out from the plate 14. The thumbscrew 18 has a flange 21 thereon which bears against the front side of the ear 19 and has a washer 22 which is pressed against the other side of the ear by a helical

spring 23 compressed between the washer and the head of the thumbscrew. The spring 23 is relatively stiff and provides sufficient frictional resistance to retain the thumbscrew in any position of rotation to which it is adjusted, and at the same time maintains the ear 19 against the shoulder 21 to eliminate all lost motion of the thumbscrew with respect to the ear 19.

The ink reservoir 1 has a bottom wall 24 (Fig. 4), a rear wall 25 and side walls 26 and 27 (Fig. 3) but is open at the top and front except for a slight upward extension 28 on the bottom wall 24. As clearly shown in Fig. 4, the ink level is normal slightly below the upper edge of this wall 28. The top of the ink reservoir is adapted to be closed by a hinged lid 29 mounted on a hinge pin 30 which extends clear through the reservoir and engages downwardly extending flanges 31 (Fig. 7) on the cover 29. When in open position the cover 29 extends substantially vertically. When the cover is in open position, slot 32 in the rear edge of the cover receives a lever 33, which will be described later. The cover is yieldably urged toward open position by a torsion spring 34 which is wound around the pin 30 and has one end bearing against the underside of the cover 29 and the other end hooked over the lever 33, as indicated at 35. The cover is yieldably held closed by frictional engagement of a detent 29a in one flange of the cover, with a hole 27a in the reservoir wall 27.

As has been previously indicated, the front end of the reservoir is open above the short wall 28 and a portion of an inking drum 36 projects through this opening into contact with an inking roller 37 (Fig. 4), which constitutes a part of the printing machine with which the present invention is to be used. The ink may be transferred from the roller 37 to the printing face of the associated printing machine in any well-known manner. The function of the structure of the present invention is to supply ink in desired adjustable quantity to the roller 37. In accordance with well-known practice, the roller 37 has a resilient surface of absorbent material, such as felt, whereas the drum 36 is of rigid nonporous material, such as metal.

The drum 36 is constructed as shown in Fig. 7 and comprises a cylindrical rim portion 38 formed integrally with a reentrant end wall 39 which terminates in an inner cylindrical hub portion 40 substantially centrally located axially of the drum. The hub portion 40 is provided with a bearing bushing 41 fitted loosely on a reduced portion 42 of a supporting shaft 43, which in turn is supported in a frame consisting of a pair of side plates 44 and 45 interconnected by the shaft 43 and by a pair of bolts 46 and 47. Axial movement of the bushing 41 along the shaft 43 is limited by a shoulder 48 at the right end of the reduced portion and by a spacer sleeve 49.

To support the drum carriage in proper position within the ink reservoir, the side plates 44 and 45 of the carriage are provided with notches 50 extending upwardly from their lower edges, which notches engage a pair of stub pins 51 extending inwardly from the side walls 26 and 27 of the ink reservoir. The stub pins are provided with shoulders 52 which properly center the drum carriage axially within the ink reservoir.

The drum 36 is spring urged outwardly into engagement with the roller 37 by a tension spring 53 (Fig. 4) stretched between a pin 54 on the side wall 27 of the ink reservoir and an arm 55

which is pivotally supported on the pin 51 and has a notch 57 adapted to receive a reduced portion 58 on the end of the shaft 43.

When the inking device is not in use, it is desirable to retract the drum 36 away from the cooperating roller 37. To this end a handle 59 constituting an extension of the frame plate 44 is extended through a slot 60 in the cover 29. When the inking device is in condition for use, as shown in Fig. 4, the handle 59 is near the forward end 61 of the slot 60 and forward movement of the drum is limited by engagement of an ear 33a on the lever 33, previously referred to, against a shoulder 62 on the upper end of the arm 55. However, if the handle 59 is swung rearwardly, the drum and the arm 55 swing therewith about the axis of the pin 51 (Fig. 5) until the ear 33a on lever 33 drops into engagement with a second shoulder 63 on the upper end of the arm 55, thereby retaining it in its rear position. The torsion spring 34 constantly urges the lever 33 clockwise (with respect to Fig. 4) and causes the ear 33a to engage the shoulder 63, as described. When it is desired to release the drum into operative position against the roller 37, this can be done by simply depressing the rear end of the lever 33 to disengage the ear 33a thereon from the shoulder 63, permitting the spring 53 to advance the drum.

A leather wiper 64 (Fig. 4) is provided to distribute the ink in a uniform layer on the drum 36 as the latter rotates (rotation of the drum 36 being caused by rotation of the roller 37 thereagainst). This leather wiper 64 is supported in a stamped metal frame 65 which in turn is oscillatably supported on the pin 47, previously mentioned (Fig. 6). The wiper is urged against the drum by a pair of torsion springs 67 which are wound around the pin 47 and have their inner ends 68 bearing against the wiper frame 65 and have their outer ends 69 hooked over the edges of the carriage frame. The frame 65 has a pair of ears 70 which extend past the leather wiper 64 (Fig. 4) and loosely engage the edges of the drum 36 to center the wiper with respect to the drum. The two springs 67 are formed from a single piece of wire, their inner ends 68 forming a continuous loop and their outer ends extending past the frame 65, as shown in Fig. 4, and serve as a stop to prevent upward escape of the leather wiper 64 from the frame 65.

The ink supply in the reservoir can be conveniently replenished through a small opening 73 in the wall 27 (Fig. 2) formed by pressing a lip out of the wall. This opening 73 is slightly below the level of the short front wall 28 (Fig. 4) so that it is impossible to overfill the reservoir without overflowing the filler opening 73.

Applicants have discovered that the amount of ink supplied to a printing mechanism from an inking device of the general type herein described, can be adjusted by varying the pressure between the drum 36 and the take-off roller 37. This pressure is adjusted in the present device by shifting the entire reservoir toward or away from the roller 37 with the adjusting screw 18 (Fig. 1). When the reservoir is moved to the right, the spring 53 (Fig. 4) is stretched, increasing the pressure between the drum 36 and the roller 37. Contrariwise, when the ink reservoir is moved to the left (Fig. 1) by the screw 18, the tension is reduced on the spring 53 and the pressure between the drum and the roller is reduced.

An important feature of the present invention is the mounting of the drum 36 by means of the

relatively short, centrally disposed, loosely fitting bearing 41, which permits the drum to rock to a substantial degree about the shaft 43, and thereby accommodate itself to any unsymmetrical positioning of the roller 37. Thus Fig. 8 shows how the drum 36 can rock about its axis and make full transverse contact with the roller 37 even though the axis of the latter is substantially out of parallelism with the shaft 43. This self-aligning feature of the drum mounting makes it practicable to construct the apparatus by mass production methods and still obtain a device that is eminently satisfactory in service. This self-aligning feature is also inherent in the construction of the wiper assembly, involving the leather wiper 64. Thus the bearing between the spring member 65 (Fig. 6) and the pin 47 is constituted by an extension or tongue 65a on the member 65 which is bent around the pin 47 into loose fitting relation therewith, so that the wiper-holder is free to rock on the pin 47 and maintain the wiper in full contact with the drum, despite rocking movement of the drum of the type illustrated in Fig. 8.

Although for the purpose of explaining the invention a specific embodiment thereof has been described in substantial detail, it is to be understood that various changes may be made in the particular construction shown without departing from the invention, which is to be limited only to the extent set forth in the appended claims.

We claim:

1. Apparatus of the type described comprising an ink reservoir, a drum dipping into ink in said reservoir and adapted to bear against and frictionally engage a roller for transfer of ink thereto by capillary attraction, a carriage and means rotatably mounting said drum on said carriage, an oscillatable arm within said reservoir, means detachably connecting said carriage to said arm for oscillation therewith, and spring means urging said arm in such direction as to move said drum toward said roller.

2. Apparatus of the type described comprising an ink reservoir, a drum dipping into ink in said reservoir and adapted to bear against and frictionally engage a roller externally of the reservoir for transfer of ink to the roller by capillary attraction, a pair of pintles in said reservoir, a carriage rotatably supporting said drum, said carriage having slots for detachably engaging said pintles, an arm in said reservoir fulcrumed on one at least of said pintles, and cooperating pin and slot elements on said arm and carriage eccentrically disposed with respect to said pintles for causing said carriage and arm to rock in unison, and spring means urging said arm in such direction as to move said drum against said roller.

3. Apparatus of the type described comprising an ink reservoir, a drum dipping into ink in said reservoir and adapted to bear against and frictionally engage a roller externally of the reservoir for transfer of ink to the roller by capillary attraction, means supporting said drum from said reservoir for free rotation and for movement with respect to the reservoir toward and away from said roller, spring means interposed between said reservoir and drum for urging the latter toward said roller, said supporting means including a handle extending from said reservoir for manually rocking the drum into inactive position out of engagement with said roller, latch means for latching said drum in inactive position, said latch comprising a lever extending exteriorly of said reservoir, whereby

the latch may be released without opening said reservoir.

4. Apparatus as described in claim 3, including a hinged lid on said reservoir, said lid having a slot therein through which said handle extends and having side walls extending down in overlapping relation with the upper portions of the side walls of the reservoir, a hinge pin extending through said side walls of said cover and reservoir for hingedly supporting the cover on the reservoir, and said latch lever being fulcrumed on said hinge pin.

5. Inking apparatus comprising an ink reservoir, a drum dipping into ink in said reservoir and adapted to bear against and be rotated by a roller for transfer of ink from the drum to the roller, means for rotatably supporting said drum comprising a shaft and a single bearing on said drum engaging said shaft, said bearing being substantially shorter axially than said drum and being centrally disposed axially of the drum and being loosely fitted on said shaft, whereby said drum has freedom to rock in a plane extending through the axes of said drum and roller, to orient itself in parallel relation to said roller and make full contact therewith from end to end.

6. Inking apparatus comprising an ink reservoir, and a drum rotatably mounted therewithin and having a portion projecting exterior of the reservoir into contact with a roller for transfer of ink thereto by capillary attraction, a supporting plate, a first pin projecting from said plate, a ferrule on said reservoir engaging said first pin, a second pin on said plate for engaging and limiting gravitational rotation in one direction of said reservoir, the second pin having a hook on the outer end for normally preventing outward movement of said reservoir away from said plate while permitting such movement following rotation of said reservoir about said first pin sufficient to disengage the reservoir from said hook.

7. Inking apparatus comprising an ink reservoir, a drum dipping into ink in said reservoir and adapted to bear against and frictionally engage a roller for transfer of ink thereto by capillary attraction, means supporting said drum for rotation within said reservoir, comprising a frame including a pair of side plates and pins interconnecting said plates, at least one of said pins being exterior of the periphery of said drum, a drum wiper adapted to bear against the periphery of the drum and wipe excess ink therefrom, said wiper extending the full width of the drum and having a narrow central extension constituting a hinge member loosely, hingedly engaging said one pin and supporting said wiper for rocking movement about said pin, spring means urging said wiper against said drum for contact with the drum throughout the axial length thereof, said hinge member engaging said pin loosely and being substantially shorter than the axial length of the wiper whereby said wiper can contact the drum along its whole length, irrespective of inaccuracy of alignment of said pin with the drum axis.

8. In apparatus of the nature described, in combination, a support, an ink reservoir, an inking drum, a transfer roller, the surface of said inking drum being in contact with the ink in said reservoir and the surface of said transfer roller whereby said inking drum applies ink to said transfer roller, means mounting said inking drum on said reservoir for movement relative thereto, means resiliently urging said inking drum into

contact with said transfer roller, and means mounting said reservoir on said support for movement toward and away from said transfer roller whereby the contact pressure between said drum and said roller may be varied.

9. In apparatus of the nature described, in combination, a support, an ink reservoir, an inking drum, a transfer roller, the surface of said inking drum being in contact with the ink in said reservoir and the surface of said transfer roller whereby said inking drum applies ink to said transfer roller, a carriage mounting said drum on said reservoir for movement with respect thereto, means resiliently urging said carriage toward said transfer roller, and manually adjustable means mounting said reservoir on said support for movement toward and away from said transfer roller whereby the contact pressure between said drum and said roller may be varied.

10. In apparatus of the nature described, in combination, a support, an ink reservoir, an inking drum, a transfer roller, the surface of said inking drum being in contact with ink in said reservoir and the surface of said transfer roller whereby said inking drum applies ink to said transfer roller, a carriage mounting said drum on and for movement with respect to said reservoir, means resiliently urging said carriage toward said transfer roller, manually adjustable means mounting said reservoir on said support for movement toward and away from said transfer roller whereby the contact pressure between said drum and said roller may be varied, and latch means coacting with said carriage adapted to hold said inking drum out of contact with said transfer roller.

11. In an apparatus of the nature described, in combination, an ink reservoir, an inking drum, a transfer roller, the surface of said inking drum being in contact with the ink in said reservoir

and the surface of said transfer roller whereby said inking drum applies ink to said transfer roller, a carriage pivotally mounted on said reservoir, means pivotally mounting said inking drum on said carriage, spring means acting between said carriage and reservoir urging said carriage toward and thus said drum into contact with said transfer roller, and manually adjustable means for moving said reservoir toward and away from said transfer roller, whereby as said reservoir is moved toward said roller, the contact pressure between said drum and said roller increases and as said reservoir is moved away from said roller, the contact pressure between said roller and said drum decreases.

12. In apparatus of the nature described, in combination, an ink reservoir, an inking drum, a transfer roller, the surface of said inking drum being in contact with the ink in said reservoir and the surface of said transfer roller whereby said inking drum applies ink to said transfer roller, a carriage pivotally mounted on said reservoir, means pivotally mounting said inking drum on said carriage, spring means acting between said carriage and reservoir urging said carriage toward and thus said drum into contact with said transfer roller, manually adjustable means for moving said reservoir toward and away from said transfer roller, whereby as said reservoir is moved toward said roller, the contact pressure between said drum and said roller increases and as said reservoir is moved away from said roller, the contact pressure between said roller and said drum decreases, a lever on said carriage for moving said drum out of contact with said transfer roller, and latch means coacting with said carriage to hold said drum out of contact with said roller.

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Certificate of Correction

Patent No. 2,320,698.

June 1, 1943.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, first column, line 19, claim 9, for the word "said" second occurrence, read *and*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of September, A. D. 1947.

[SEAL]

LESLIE FRAZER,
First Assistant Commissioner of Patents.