June 5, 1956 W. J. HANSON ET AL 2,748,698

INKING DEVICE

Filed Feb. 5, 1952 3 Sheets-Sheet 1

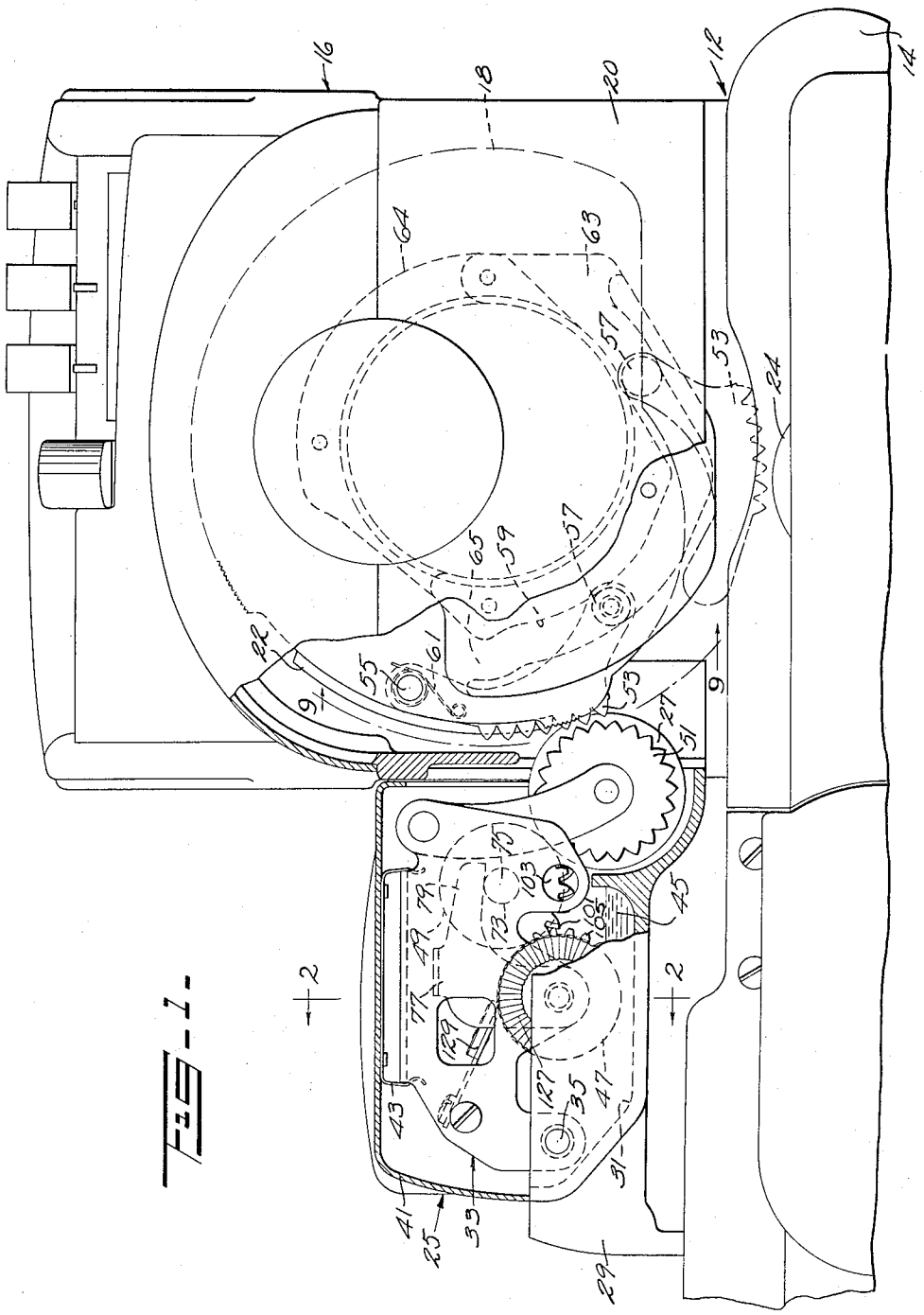


FIG. 1.

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Filed Feb. 5, 1952 3 Sheets-Sheet 2

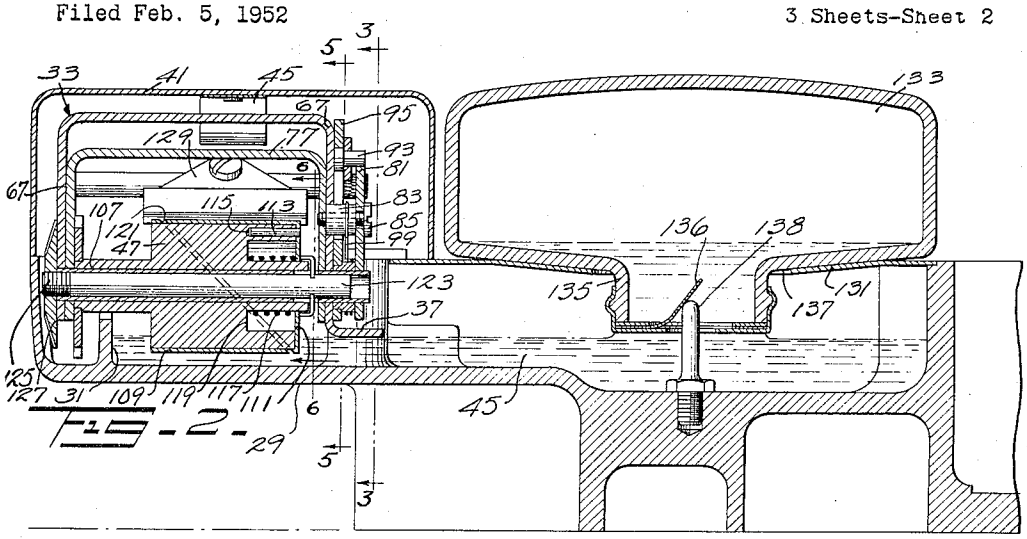


FIG-2-

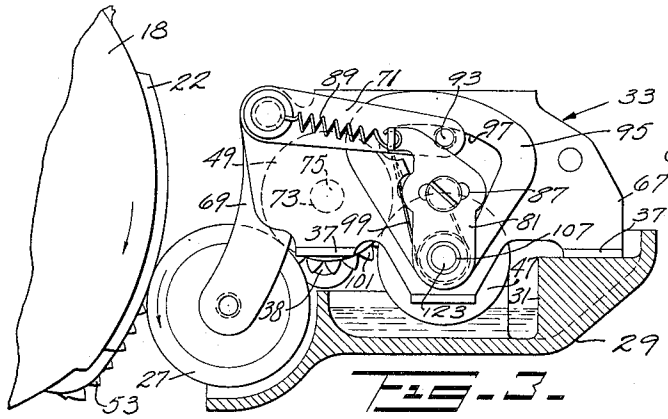


FIG-3-

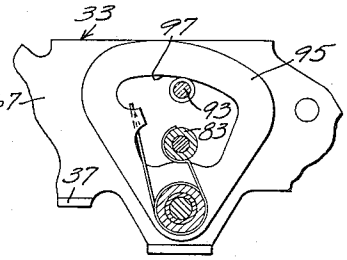


FIG-5-

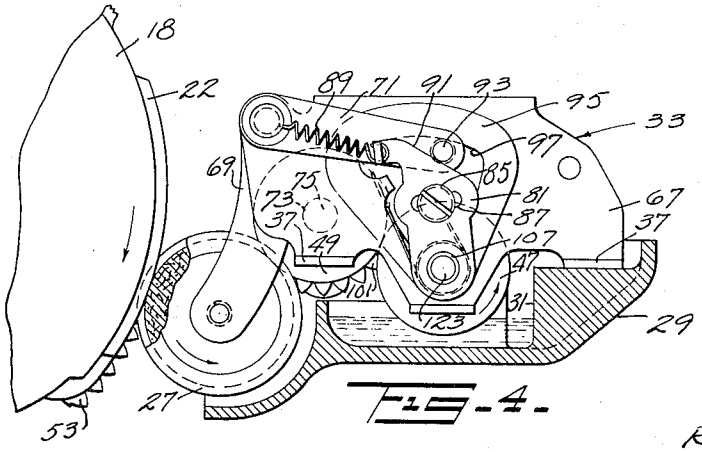


FIG-4-

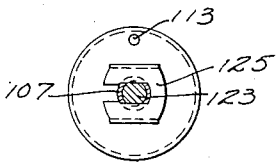


FIG-6-

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INKING DEVICE

Filed Feb. 5, 1952 3 Sheets-Sheet 3

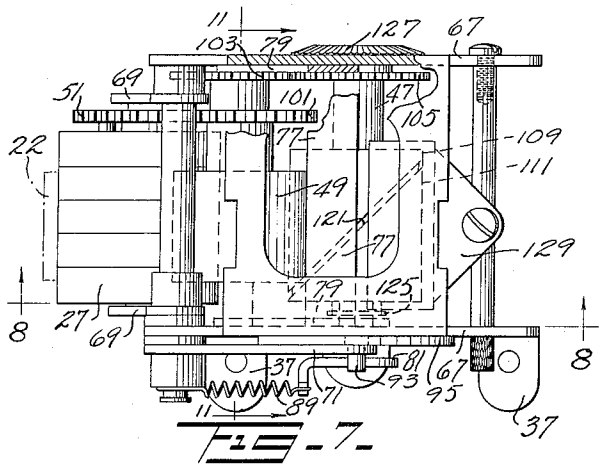


FIG. 7.

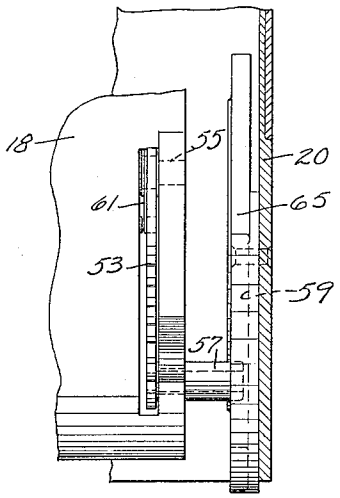


FIG. 9.

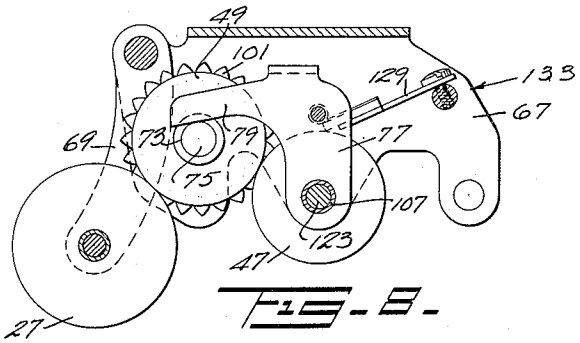


FIG. 8.

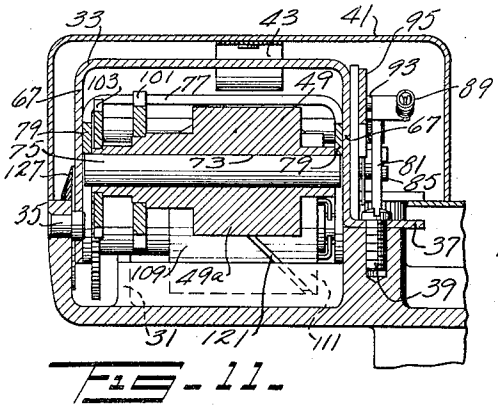


FIG. 11.

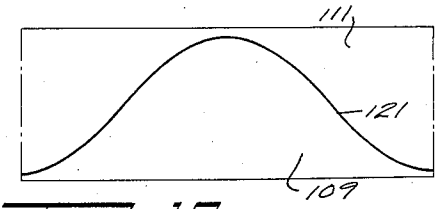


FIG. 10.

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United States Patent Office 2,748,698 Patented June 5, 1956

2,748,698

INKING DEVICE

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Application February 5, 1952, Serial No. 270,012

13 Claims. (Cl. 101—350)

This invention relates to inking of type by an inking roller, and more particularly to the inking of type in an intermittently operating device.

It is an object of the present invention to provide a means and method whereby an intermittently operating printer is provided with suitable roller inking such that the inker is operated only at those times when inking of the printing die is to be accomplished, thus avoiding accumulation of excess ink in the intervals between, but in which there is also a positive starting of the inker just prior to its contact with the die to avoid skidding of the printing die or surface wear and damage caused by the starting load when starting of the inker is accomplished by surface contact between the die and inking roller.

In those printing mechanisms such as postage printing meters, where sporadic operation is also the rule, it is customary to employ ink which is relatively fluent, and to use an inking roller having an absorbent capillary surface, e. g. of felt, which holds a supply of ink in readiness for the printing mechanism at all times even though the machine has not been recently operated. This is effective to keep the ink ready for the next printing operation, but suffers from the objection that such absorbent rollers wear rapidly and hence may require frequent replacement if used sufficiently.

It is an object of the present invention to reduce the wear on the surface of an absorbent inking roller to lengthen the intervals between replacements.

A feature of the present invention is the prestarting of the inking roller and all mechanism drivingly associated therewith so that the surface speed of the inking roller is substantially that of the type when the two come into contact.

Since inking contact must be maintained between the inking roller and the type in spite of surface wear on the former, it has been customary to bias the roller against the type with a consequent tendency to augment the wear somewhat. The present invention has for another object the presenting of the inking roller to the type in touching, but essentially unbiased condition, and the automatic adjustment of the roller position to compensate for the surface wear, thus removing another factor in the cause of such wear.

Another feature of the invention is concerned with the attainment of the immediately foregoing object and is the provision of sensing means for determining the degree of surface wear, and means responsive to the sensing means for adjusting the roller to proper position relative to the type surface.

Still another object of the invention is the metering of the flow of ink to the inking roller in a manner which is susceptible of extremely accurate control but without placing reliance upon delicate or complicated mechanism.

Another feature of the invention is the carrying out of the immediately foregoing object by means of an adjustable ink groove formed between opposed axially adjustable sleeves on a metering roller.

Still another further feature of the invention is the arrangement of parts so that the sensing means and the transfer roller, which conveys ink from the metering means to the inking roller, are one.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A preferred embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a front elevation, partially in section, illustrating an inking mechanism according to the invention and showing the same as applied to a postage printing meter, with a secondary position of one of the parts shown in broken lines;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 3 but showing the positions of the parts after wear of the inking roller has occurred;

Fig. 5 is a detail section taken on line 5—5 of Fig. 2;

Fig. 6 is a detail section taken on line 6—6 of Fig. 2;

Fig. 7 is a plan of the inker assembly shown in Figs. 1 to 4, but removed from the printing machine and from the ink reservoir;

Fig. 8 is a section taken substantially on line 8—8 of Fig. 7;

Fig. 9 is a detail section taken substantially on line 9—9 of Fig. 1;

Fig. 10 is a developed view of the surface of the pick-up roller; and

Fig. 11 is a section taken substantially on line 11—11 of Fig. 7.

Referring now to the drawing, there is shown a postage printer 12 equipped with inking mechanism according to the present invention. The machine comprises a machine base 14 which carries a removable meter and printing mechanism 16 including a rotary printing drum 18 and a housing 20 therefor. Carried on the printing drum surface is a printing die 22 which cooperates with an impression roller 24 on the machine base to feed forward and print postage on envelopes or tape introduced between them. The inking mechanism is indicated generally by a reference character 25 and is mounted on the machine base 14 in an appropriate position for inking contact with the die 22 when the meter 16 is in place.

Since the machine is often used sporadically and is required to print each time at the first operation, the ink used is of a type which is relatively fluid and which dries very slowly except when applied in thin layers to absorbent paper. For applying this ink to the printing die, an inking roller 27 of absorbent material such as felt is employed, which, when properly moistened with the fluid ink, presents a fully inked surface ready for use at all times regardless of whether the machine has been recently used or not.

According to the preferred form of the invention illustrated, the inker mechanism 25 includes a base element 29 including an integral reservoir 31, and an inker assembly frame 33 mounted in the base element, for example by pins 35 at one side, and ears 37 at the other which may be fastened down to the base element by fasteners such as screws 39 (Fig. 11). A cover 41 is placed over the reservoir 31 and the inker assembly 33 and is held in place by a spring clip 43 which is designed to engage the upper portion of the inker assembly.

The inking roller 27 is supplied with fluid ink 45 from reservoir 31 by means of a pick-up roller 47 and a con-

tacting transfer roller 49 which will be described at length hereinafter.

In order to prevent skidding of the driven printing die during initial contact with the inking roller 27 and incidental wear on the inking roller, the present invention provides means for effecting starting rotation of the inking roller 27 and the operation of its ink supplying mechanism before the printing die contacts with the roller 27. In this manner contact will be merely a rolling of the inking roller against the die instead of there being a tendency for relative surface motion due to inertia and friction resulting in abrasion of the softer inking roller.

As seen in Fig. 1, the starting mechanism includes a gear 51 which is integrally connected to the inking roller for rotation therewith, and a segment or rack 53 mounted on the printing drum 18. The teeth of the gear and rack are of a special ogival profile which are so designed to prevent end to end contact during engagement of the rack and gear teeth. When a new inking roller is used, the rack and gear teeth have less tooth contact than when the surface of the inking roller is worn. The axis spacing shown in Fig. 1 represents that for a new roller, and as the surface wears, the gear 51 will gradually move into closer mesh with rack 53. The solid line position of the parts in Fig. 1 represents the rest or stopping position of the mechanism between printing operations. In this position the segment 53 is already in mesh with the gear 51 but the printing die 21 has not yet come into contact with the surface of the inking roller 27. When a printing rotation is started the rack 53 effects slight rotation of the gear 51 before the die 22 and the inking surface of roller 27 touch. When the end of the rack 53 is reached, continued rotation of the inking roller 27 and driving of its associated ink supply mechanism occurs in response to the contact of the roller 27 with the die 22.

In order to prevent interference between the rack 53 and a workpiece such as an envelope being printed, the rack must be withdrawn to a position radially inward of the surface of the die 22 before it reaches a position opposite the impression roller 24. To this end the rack 53 is pivoted at one end on the drum 18 by a pin 55 and carries at its other end a roller 57 which runs in a cam or guide slot 59 arranged on the internal surface of the housing 20. A torsion spring 61 urges the rack 53 in a radially outward direction at all times. As can be seen from Fig. 1, the slot 59 guides the roller 57 through about one-half of each rotation of drum 18 while the roller is in the lower part of the housing 20. When the rack is in the bottom position as seen in broken lines in Fig. 1, the slot 59 is so shaped as to hold the rack 53 retracted and in a position where it is incapable of touching the impression roller 24 or a workpiece being fed thereby. When the roller 57 leaves the exit 63 of the slot 59, it is urged against the surface or edge 64 by the spring 61 and is thus directed into the entrance mouth 65 before reaching the home position of Fig. 1.

Instead of urging the inking roller 27 into contact with the printing die 22, the present invention provides for a light touching contact between the surfaces utilizing the resilient properties of the absorbent inking roller 27 alone and foregoing any bodily urging of the roller towards the die 22. Since the roller 27 is held in a fixed die contacting position without any tendency to bound away from the die on initial contact, the inking pressure between the surfaces can be extremely light and still remain effective at all times. In this fashion, the wear on the roller 27 can be further reduced as a result of the significant reduction in inking pressure achieved by this arrangement.

With this type of an arrangement the positioning of the roller 27 with respect to the surface of the die 22 must be accurate and its axis position should be frequently changed to take into account the changing diameter of the inking roller resulting from such surface wear as does occur. Preferably, the setting of the roller 27 should occur continuously and automatically and means for accomplishing this is provided according to the present invention. This means includes mechanism for sensing the reduction in the diameter of roller 27 and means for translating this reduction into a compensating movement of the roller axis. Turning to Figs. 3, 4 and 8, it will be seen that the ink pick-up roller 47 is rotatably mounted between the side plates 67 of the inker assembly frame on a fixed axis. The inking roller 27 is rotatably mounted between the depending ends of pivoted arms 69 which can swing so as to move the roller axis towards or away from the die 22. A control arm 71 is integrally connected with the arms 69 so that the latter will swing in response to movement of the former. The ink transfer roller 49 is disposed loosely between the end plates 67, rests on the rollers 27 and 47, and serves to carry the ink from the pick-up roller 47 to the inking roller 27. The transfer roller 49, however, also acts as a sensing means for detecting the amount of wear which the inking roller 27 has experienced, and to this end the central section 49*a* thereof is of a length equal to the width of the printing die 22 and has a corresponding axial position. Thus, as seen in Fig. 4, whenever any wear occurs, the central section 49*a* of roller 49 is of the proper size and in the proper axial position to fall into the groove occasioned by such wear. Fig. 4 illustrates the position of the parts after a certain amount of wear of the surface of roller 27 has occurred, and shows both the die 22 and the transfer roller portion 49*a* running against the bottom of the wear groove. Transfer roller 49 has an axial bore 73 in which is rotatably mounted a shaft 75 whose ends project slightly beyond the ends of the roller 49 as seen in Fig. 11. A bail 77 pivotally mounted on the frame 33 carries a pair of forwardly extending arms 79 which rest upon the ends of shaft 75 and serve as spacers to prevent axial sliding of the roller 49 on the shaft 75. Also pivoted on the axis of roller 47 is a cam plate 81 which is preferably placed exteriorly of the side plates 67 and which is connected to the bail 77 by a screw 85 (Fig. 2) which passes through a spacing collar 83 and is threaded into one side of the bail 77. Preferably the cam plate 81 also includes a slot 87 through which the screw 85 passes, so that the relative angular position of the plate 81 and the bail 77 can be adjusted if necessary. A tension spring 89 urges the cam plate 81 in a direction such that the arms 79 of the bail 77 are forced downwardly against the ends of shaft 75 carrying roller 49, i. e. to the left in Figs. 3 and 4. Thus, it can be seen that the arms 79 are resiliently urged against the shaft 75 and follow the same as it descends in response to wear of the surface of roller 27. The upper sloping cam surface 91 of the cam plate 81 is arranged to receive thereagainst a follower pin 93 carried by the free end of the arm 71 so that as the cam plate 81 swings to the left, due to wear of the surface of roller 27, the pin 93 will be permitted to drop with consequent movement of arms 69 to the left whereby roller 27 is adjusted into proper position for making contact with the printing die 22.

Means is also provided for urging the pin 93 downwardly against the sloping surface 91 and for holding the same in contact therewith. This means is shown particularly in Figs. 3 to 5 and includes a second pivoted cam plate 95 having a downwardly facing cam edge 97 for engaging the upper surface of the pin 93. The plate 95 is urged to the left in Fig. 5 by a torsion spring 99 so that as rapidly as the pin 93 is allowed to drop due to the leftward movement of the cam plate 81, the cam plate 95 swings to the left and cams the pin 93 to its new lower position, thus extending the inking roller 27 to its new correct inking position. The slope on the surface 97 of cam plate 95 is sufficiently gradual that upward forces against the same exerted by the pin 93 are incapable of swinging the plate so that arm 71 and arms 69 together with the inking roller 27 are effectively locked in each adjusted position as it is reached.

For the best inking operation, it is desired to have the

pick-up roller 47 and the transfer roller 49 positively driven and this result is achieved by gearing the same together and to the inking roller 27. The transfer roller 49 carries a gear 101 which meshes with gear 51 on the inking roller 27, preferably having the same special ogival tooth profile as that of the rack 53. Conventional spur gears 103 and 105 connect rollers 49 and 47 to provide a direct drive therebetween.

The present invention also provides a novel method of and means for accurately metering the fluid ink supplied to the inking roller 27. The small amount of ink which must be replaced from time to time is found to be more accurately controllable with less deterioration of the ink when handled as a narrow strip of significant thickness rather than attempting to spread a broad coating of extremely minute thickness. According to the invention this method is put into practice by having a cylindrical pick-up roller which dips into a constant level ink supply. The pick-up roller is provided with one or more grooves in its surface, which grooves are angularly related to the elements of the cylinder so as to provide contact points between the groove and an adjacent roller at various places along the roller's length as the grooved cylinder is rotated. A development of a roller surface having such groove means is illustrated in Fig. 10 wherein a single undulating groove is employed. It can be seen that by having the width of the groove adjustable and wiping all other surfaces of the roller clean of ink, an extremely accurate control of the ink feed can be obtained. The angular relationship of the groove to the cylinder element likewise prevents any interference between the groove and a wiper element as the cylinder rotates.

The structure for obtaining this type of operation is particularly shown in Fig. 2 from which it can be seen that the pick-up roller 47 is mounted for rotation on a fixed tubular shaft 107 which, incidentally, may also serve as a support for the bail 77 and cam plates 81 and 95. The outer surface of the roller 47 is made up of two sleeve portions 109 and 111 which are formed with inner matching elliptical ends as if formed from a single sleeve by a cut at an angle to its axis. The sleeve section 109 is firmly connected to the roller body while the section 111 is axially slidable and is keyed against rotation thereon by the sliding of an integral pin 113 in a suitably positioned axial opening 115. A compression spring 117 housed in a suitable end recess 119, formed in the end of the roller 47, tends to urge the sleeve part 111 away from the part 109 so as to widen the groove 121 formed between their adjacent edges. A control shaft 123 is slidable within the hollow shaft 107 and has a thrust plate 125 (Fig. 6) connected with one end thereof and operating through suitable slots in the shaft 107 to engage against the end of the movable sleeve portion 111. The other end of the shaft 123 is threaded as indicated by reference character 125 to receive a fluted finger wheel 127 by means of which the control shaft 123 may be moved to the left as seen in Fig. 2. Thus, when the finger wheel is moved in a clockwise direction, that is to say, threaded onto the shaft 123, the groove 121 will be reduced in width by movement of the sleeve portion 111 to the left. When finger wheel 127 is moved in a counterclockwise or unthreading direction (Fig. 1) the shaft 123 and sleeve portion 111 will be urged to the right by spring 117, thus widening the groove 121.

The only ink transferred from the pick-up roller 47 to the transfer roller 49 is that which is contained in the groove 121, for a scraper or wiper blade 129 mounted at a suitable location on the frame 33 rests against the pick-up roller 47, strips the surface thereof of ink and returns the ink to the reservoir 31. In the form of the invention shown, the groove 121 is shown as a continuous groove extending beyond the ends of the transfer roller 49. This arrangement is designed to prevent accumulation of excess ink at the peaks or stop-and-return portions of the groove and to provide for a uniform inking across the whole length of roller 49 which will, in turn, ink the working length of roller 27 uniformly. It is preferable that the diameters of the transfer roller 49 and the inking roller 27 be substantially different in order to avoid repeated inking of the inking roller 27 in the same spot and to progress the areas of ink application gradually around the surface of roller 27.

Fig. 2 also illustrates a preferred form of ink supply for maintaining a constant and suitable level of ink in the reservoir 31. This consists of a platform 131 for receiving an inverted ink container 133, having a neck 135 projecting downwardly through an aperture 137 in the platform 131, to a suitable level at which it is desired to maintain the ink in the reservoir 31. Preferably the neck of the bottle 135 is closed by a suitable flexible valve flap 136 which permits inversion of the bottle without danger of spilling the contents. Mounted in the bottom of the reservoir 33 and extending upwardly therefrom is a valve control pin 138 which strikes against the valve flap 136 as the bottle 133 is moved into position and opens the flap to permit the fluid ink to flow from the bottle into the reservoir. The flow of ink from the bottle will continue only until the level in the reservoir 31 reaches the bottle neck at which time access of air to the interior of the bottle is cut off. Thereafter ink will flow from the bottle only when enough is used from the reservoir to allow a bubble of air to escape into the bottle, and an ink level in the reservoir as determined by the lowermost portion of the bottle neck will be maintained at all times, thus providing for uniform and accurate operation of the ink metering mechanism heretofore described.

In the operation of the mechanism as above described, the rotation of the printing drum 18 which occurs sporadically whenever printing of one or more workpieces is desired, will start the rotation of the roller 27 by means of the rack 53 and as the printing die 22 comes into contact with the roller 27 it will be linked and will continue to drive the roller by friction so long as an inking contact is maintained. As the printing die 22 moves along further towards printing position, the rack 53 is automatically retracted to a non-interfering position by means of the guide slot 59. The rotation of the inking roller 27 in addition to inking the printing die 22 also drives the ink feed mechanism through the gear train 51, 101, 103, 105, so that a replenishment process is always in progress whenever inking occurs. During this process, ink is picked up by the roller 47, all of the surface ink being removed by the scraper knife 129, and the ink contained in those portions of groove 121, which move into contact with the transfer roller 49, is picked up by the latter and subsequently transferred to the surface of roller 27. The amount of replenishment is accurately adjustable by setting the finger wheel 127 to narrow or widen the groove 121 so that the requirements of the printing mechanism can be exactly filled. In order that the action of the groove 121 and the amount of ink retained thereby shall be as accurate as possible, the ink depth in the reservoir is maintained constant so that the degree of dip of pick-up roller 47 into the ink supply is always the same.

The riding of transfer and wear-sensing roller 49 against the surface of inking roller 27 keeps a constant check on the amount of wear which has occurred, and, through the operation of arms 79 on the bail 77, cam plates 81 and 95, follower pin 93, arm 71 and arms 69, positions the inking roller 27 in exactly the right place to make contact with the printing die 22 with a suitable light inking pressure, thus holding the surface wear of the roller 27 to a minimum amount.

Having described the invention, what is claimed is:

1. The method of inking a printing die which comprises relatively moving the die and an inking roller to bring the latter into rolling contact with the surface of the die; continuously sensing the effective radius of the surface of the inking roller which contacts the die as

said surface wears; unyieldingly spacing the inking roller axis at a distance from the surface occupied by the printing die during inking such that predetermined inking pressure between the surface and the die will be obtained during inking; and continuously changing said unyielding spacing in accordance with the sensed changes of said radius.

2. The method of inking a printing die which comprises relatively moving the die and a resilient inking roller to bring the latter into rolling contact with the surface of the die; continuously sensing the effective radius of the surface of the inking roller which contacts the die as the surface wears; unyieldingly spacing the inking roller axis at a distance from the surface occupied by the printing die during inking such that predetermined inking pressure between the resilient roller and the die will be obtained during inking; initiating rotation of said roller about its axis before making surface contact with the die at a surface speed substantially that of said relative motion; and continuously changing said unyielding spacing in accordance with the sensed changes of said radius.

3. In a printing device a rotary printing drum and a printing die carried on a portion of said drum and having an inking position and a printing position; an inking roller mounted adjacent said drum at said inking position and in position to touch said die and roll thereover to ink the same as the drum is rotated; a gear connected to said roller; a rack movably mounted on said drum and engageable with said gear for rotating the roller prior to its contact with said die; means for moving said rack into gear engaging position when opposite said roller; and means for retracting said rack to non-interfering position when opposite the printing position.

4. In a printing device, a printing member; an inking roller softer than the printing member for inking the printing member; means for mounting the inking roller for rotation about its axis and for bodily moving the roller towards and away from the printing member; means for sensing the effective radius of the inking roller portions touching the printing member and moving to a position indicative of the same, and means for controlling the operation of said roller moving means in response to the movement of said sensing means.

5. In a printing device, a printing member; a resilient inking roller softer than the printing member for inking the printing member; movable means for mounting the inking roller for rotation about its axis and for bodily moving the roller towards and away from the printing member; a sensing roller resting against the portions of said inking roller touching the printing member and movable towards the inking roller axis as the surface of the inking roller wears away; and means controlled by the position of the sensing roller for controlling the inking roller moving means to unyieldingly hold the inking roller axis in proper inking position with respect to said printing member.

6. In a printing device, a printing member; a resilent inking roller softer than the printing member for inking the printing member; means for mounting the inking roller for rotation about its axis and for bodily moving the roller towards and away from the printing member; a sensing roller resting against the portion of said inking roller touching the printing member and movable towards the inking roller axis as the surface of the inking roller wears away; means controlled by the position of the sensing roller for limiting the movement of the inking roller moving means in a direction towards the printing member; and means for holding the inking roller moving means against said limiting means.

7. In a printing device, a printing member; a resilient inking roller softer than the printing member for inking the printing member; means for mounting the inking roller for rotation about its axis and for bodily moving the roller towards and away from the printing member; a sensing roller resting against the portion of said inking roller touching the printing member and movable towards the inking roller axis as the surface of the inking roller wears away; means controlled by the position of the sensing roller for limiting the movement of the inking roller moving means in a direction towards the printing member; and cam means for urging and locking the mounting means against said limiting means.

8. An inking device comprising a reservoir; an inking roller; means to transfer ink from said reservoir to said inking roller comprising an ink metering cylinder mounted for rotation so that its lower portion dips into the ink in said reservoir, said cylinder having a groove on its surface running at angles to the cylinder elements; and a wiper resting against said cylinder for removing the ink other than that picked up by said groove.

9. An inking device comprising a reservoir; an inking roller; means for maintaining a substantially constant level of ink in said reservoir; means to transfer ink from said reservoir to said inking roller comprising an ink metering cylinder mounted for rotation so that its lower portion dips into the ink in said reservoir, said cylinder having a groove on its surface running at angles to the cylinder elements; and a wiper resting against said cylinder for removing the ink other than that picked up by said groove.

10. An inking device comprising a reservoir; an inking roller; means for maintaining a substantially constant level of ink in said reservoir; means to transfer ink from said reservoir to said inking roller comprising an ink metering cylinder mounted for rotation so that its lower portion dips into the ink in said reservoir, said cylinder having a groove on its surface running at angles to the cylinder elements; a wiper resting against said cylinder for removing the ink other than that picked up by said groove; and means to adjust the width of said groove.

11. An inking device comprising a reservoir; an inking roller; means to transfer ink from said reservoir to said inking roller comprising an ink metering cylinder mounted for rotation so that its lower portion dips into the ink in said reservoir; a pair of sleeves mounted on said cylinder for relative axial sliding motion and formed at their opposed ends with cooperating profiles forming a groove which narrows and widens with relative axial movement of said sleeves; means to adjust one sleeve axially with respect to the other to control the width of said groove; and a wiper resting against said sleeves for removing the ink other than that picked up by said grooves.

12. In a printing device a rotary printing drum carrying a printing die on a part of its surface; means for inking the printing die comprising an inking roller softer than said printing die, a pick-up roller and a transfer roller each having a gear thereon and being geared together for a positive drive from one to the other; a rack on said printing drum engageable with the gear on said inking roller for initiating rotation thereof and of said pick-up and transfer rollers prior to contact of said inking roller with said printing die, said transfer roller resting on said pick-up roller and said inking roller and being designed to move downwardly in response to wear of said inking roller surface; and means controlled by the position of said transfer roller for adjusting the position of said inking roller.

13. In a printing device a rotary printing drum carrying a printing die on a part of its surface; means for inking the printing die comprising an inking roller softer than said printing die, a pick-up roller and a transfer roller each having a gear thereon and being geared together for a positive drive from one to the other; a rack on said printing drum engageable with the gear on said inking roller for initiating rotation thereof and of said pick-up and transfer rollers prior to contact of said inking roller with said printing die, said transfer roller resting on said pick-up roller and said inking roller and being designed to move downwardly in response to wear of said inking roller surface; and means controlled by the

position of said transfer roller for adjusting the position of said inking roller, the profiles of said rack and the gearing connecting said inking roller and said transfer roller with each other and with said rack being ogival.

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