

Aug. 10, 1965

C. D. NITCHIE

3,199,451

INK DISTRIBUTION DEVICE

Filed Aug. 2, 1963

2 Sheets-Sheet 1

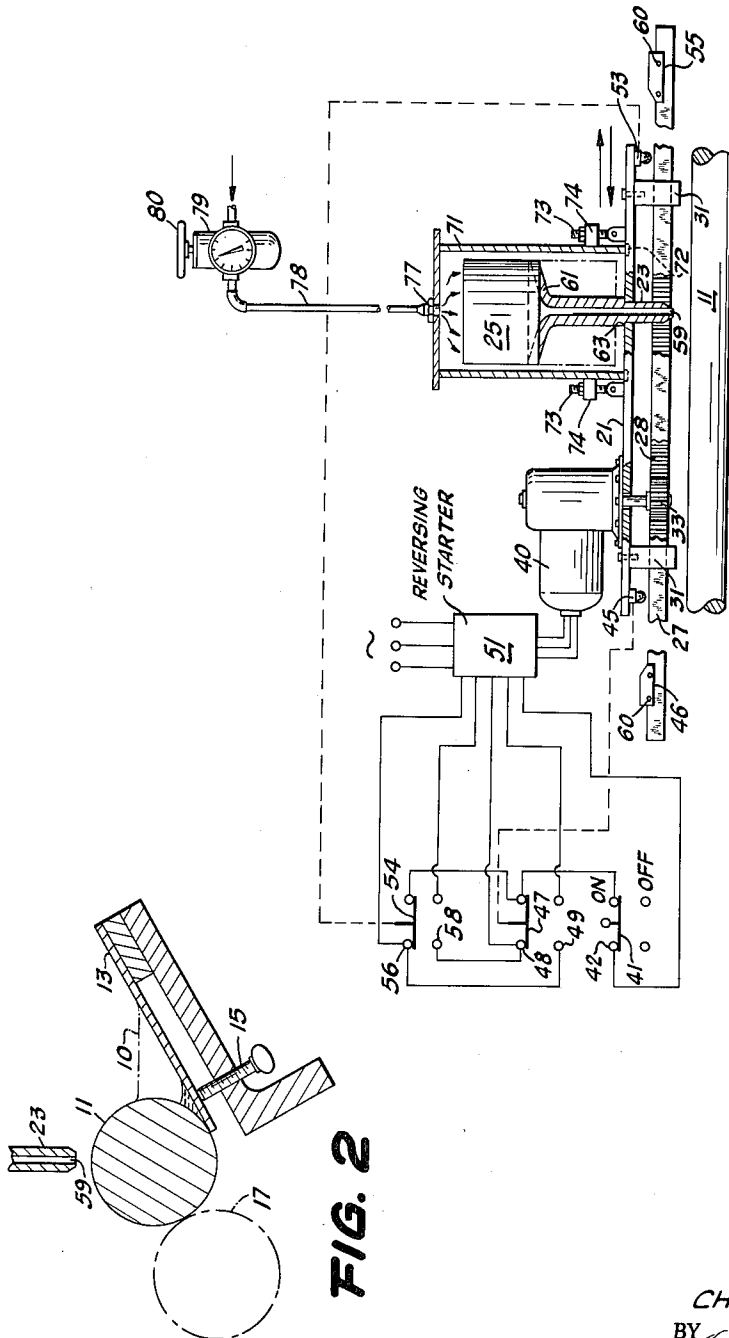


FIG. 1

INVENTOR.

CHARLES D. NITCHIE

BY *Wesley B. Brumback*
his Attorney

Aug. 10, 1965

C. D. NITCHIE

3,199,451

INK DISTRIBUTION DEVICE

Filed Aug. 2, 1963

2 Sheets-Sheet 2

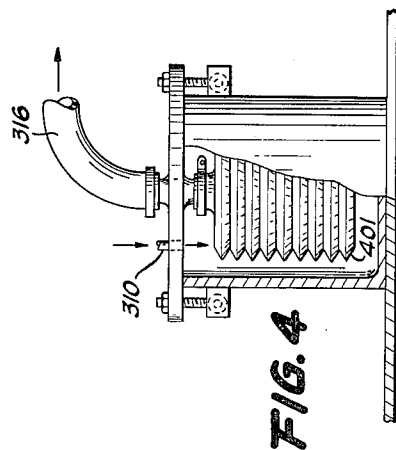


FIG. 4

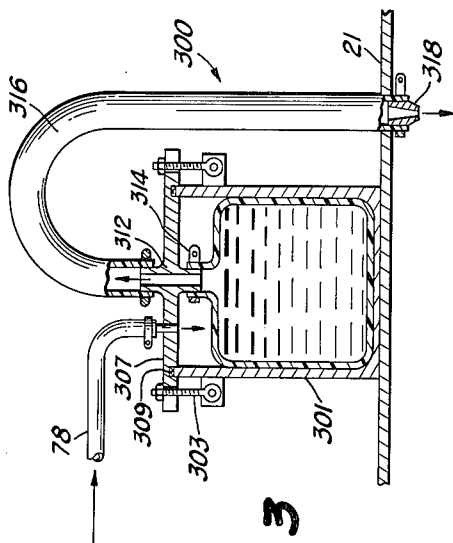


FIG. 3

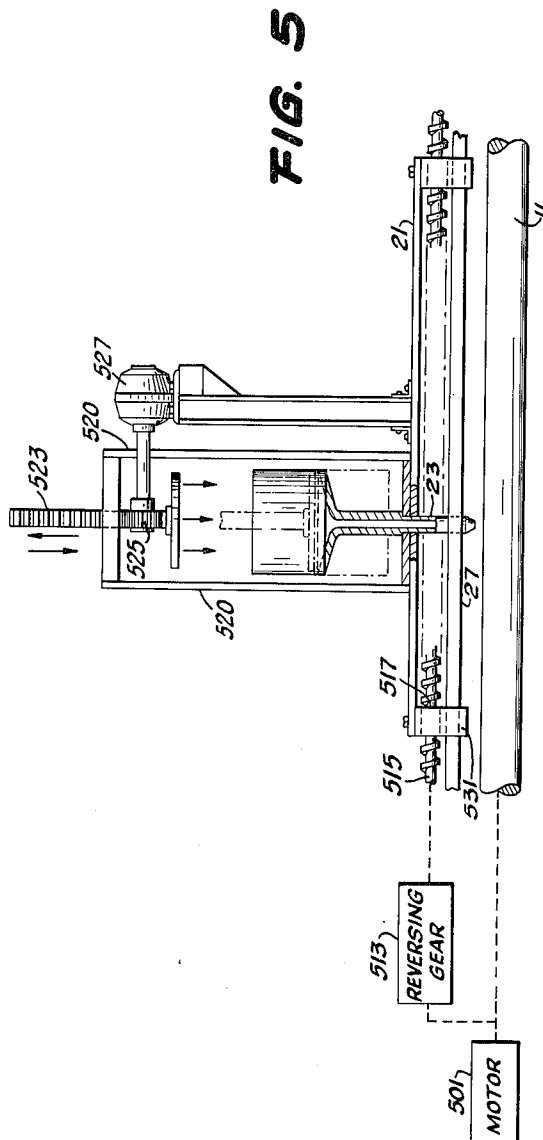


FIG. 5

INVENTOR.
CHARLES D. NITCHIE

BY
Oscar B Brumback
his Attorney

1

3,199,451

INK DISTRIBUTION DEVICE

Charles D. Nitche, Baltimore, Md., assignor to Koppers Company, Inc., a corporation of Delaware
Filed Aug. 2, 1963, Ser. No. 299,545
3 Claims. (Cl. 101-366)

This invention relates to the supplying of ink to the fountain roll of a letter press.

The ink for the printing dies of a printing press is conventionally held in a reservoir that is formed by a blade and a fountain roll. The blade is in tangential contact with the fountain roll but is inclined upwardly at an angle of about thirty degrees. The ink, which has a grease-like consistency, flows through a slight gap between the fountain roll and the blade onto the fountain roll as a thick film across the fountain roll. This film is transferred by contact to an intermediate roll and thence to the printing dies. A plurality of screws at spaced intervals beneath the blade along its length provide for the varying of the pressure of the blade against the fountain roll by adjusting the tension of the screws to control thereby the thickness of the ink film passing between the blade and the roll onto the roll as the roll revolves. One such arrangement is described in greater detail in copending application Serial No. 861,614 and now matured into H. D. Ward, Jr., et al. Patent No. 3,116,688 entitled "Ink Fountain."

Conventionally, the ink is dipped from a can with a spatula or other tool and placed in the reservoir. This manual operation is time-consuming, awkward, and messy. In addition, it is difficult to estimate the exact amount of ink required for the printing operation. If a residue of ink remains in the reservoir at the end of the printing of a quantity of material, it must be removed and returned to the ink container. Such operation also is time-consuming and, in addition, results in a waste of ink as it is difficult to remove all the residue from the reservoir because of the physical configuration of the reservoir.

The foregoing practice also has another disadvantage. It has been necessary to use a device known as a fountain divider, or in the absence of this, to place rags or other expedients in the reservoir to provide a dam to limit the length of the ink film on the fountain roll.

An object of this invention, therefore, is to place the ink directly from the ink container onto the surface of the fountain roll. Another object is to control the length of the film of ink on the fountain roll.

This invention contemplates a novel apparatus adapted to be mounted above the fountain roll for applying the ink directly to the fountain roll in a linear path of travel. In one embodiment of the invention, a carriage is mounted above the fountain roll. This carriage supports a motor which reciprocates the carriage along the axis or the rolls. Adjustable limits provide for varying the extent of reciprocation. The carriage also supports a quantity of ink in its original container and includes a provision for flowing the ink from the container directly onto the fountain roll.

The above and further objects and novel features of the invention will appear more fully from the following detailed description when the same is read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are not intended to be a definition of the invention but are for the purpose of illustration only.

In the drawings wherein like parts are marked alike:

FIGURE 1 is a partially schematic and partially elevational view with sections broken out of an embodiment of the invention;

2

FIGURE 2 is a sectional view of the fountain roll of a printing press;

FIGURE 3 illustrates another embodiment of the invention;

FIGURE 4 illustrates the embodiment of FIG. 3 with a container of different type; and

FIGURE 5 illustrates a still further embodiment of the invention.

As illustrated in a cross-section in FIG. 2, the reservoir 10 for a printing press is formed by a fountain roll 11 and a ductor blade 13. Screws 15 adjust the tension of blade 13 against roll 11 to control the thickness of the ink film of the roll. The ink film is transferred to intermediate roll 17 and then to the printing dies (not shown). This is conventional. It will be understood, of course, that the foregoing constitutes only a small portion of the complex mechanism of a printing press.

The reservoir 10 has customarily been filled with ink by dipping the ink from a can and placing it in the reservoir. As has been pointed out, this makes it difficult to judge the exact amount of ink to be used and to remove residue ink from the reservoir after the operation is completed. The dotted line shows the conventional level of ink in the reservoir.

In accordance with this invention, there is provided a novel means for flowing the ink directly from the container to the fountain roll and for controlling the path of travel of flow onto the fountain roll. As illustrated, a carriage 21, FIG. 1, is mounted directly above fountain roll 11 so that the carriage can reciprocate axially of the fountain roll along a predetermined length of travel. The carriage includes an outlet nozzle 23 for the flow of ink directly from the ink container 25 onto fountain roll 11.

Carriage 21 rides on a pair of spaced, parallel rails 27 and 28 which are mounted in a conventional manner (not shown) above and parallel to the axis of the fountain roll 11. Four conventional slide bars 31 are notched to fit rails 27 and 28 and to maintain the carriage in position on the rails. One of the rails 28 has teeth thereon for engagement with a gear 33. Thus rail 28 and gear 33 constitute a rack and pinion for the movement of carriage 21.

A conventional reversible electric motor 40 is mounted on carriage 21 for driving the gear 33. Upon the manual engagement of the start-stop switch bar 41 with contacts 42, motor 30 is energized from a suitable source of electrical energy and operates to turn gear 33, for example, in a direction to travel carriage 21 towards the left.

To control the length of travel of the carriage, stops 46 and 55 with coacting trip switches 45 and 53 are provided. Thus as carriage 21 reaches a predetermined point of travel, a conventional trip switch 45 rides over stop 46 and disengages contact bar 47 from contacts 48 and engages it with contacts 49. This actuates a conventional reversing starter 51 to reverse motor 40 and cause the carriage 21 to travel in the other direction.

As the carriage 21 proceeds to the right a predetermined amount, the trip switch 53 engages stop 55. This disengages bar 54 from contacts 56 and engages it with contacts 58. Again motor 40 reverses and travels the carriage towards stop 46. Thus motor 40, by its reversing operation, reciprocates carriage 21 axially of fountain roll 11. Stops 46 and 55 are adjustable on bar 27 by conventional means, as for example, by set screws 60. Thus by suitably positioning the limit stops 46 and 55, the length of travel of carriage 21 may be varied to the extent desired.

Conventionally, manufacturers of ink supply the ink in an open-ended container that is closed by a lid (not shown). In accordance with this invention, the lid is

removed; and provision is made for flowing the ink directly from the container onto the fountain roll.

In accordance with this invention, carriage 21 includes a nozzle 23 for flowing the ink directly from the ink container onto the fountain roll. In the embodiment illustrated in FIG. 1, the nozzle is in the nature of a tube which terminates at its lower end in an orifice 59 of a predetermined size and at the other end in a piston 61 which is adapted to fit tightly within the conventional ink can. A shoulder 63 prevents relative movement downwardly of the nozzle. As the ink can is pressed down from the solid line position to the dotted line position on piston 61, the ink is forced to flow through nozzle 23 and out orifice 59.

In the embodiment of FIG. 1, the can 25 is illustrated as being forced down over piston 61 by pneumatic pressure. To this end, a housing 71 is placed over the can and against seal ring 72. Toggle bolts 73 engage in slots in the flanges 74 of the housing to maintain it in an air-tight position on carriage 21. At the top of the housing is fitting 77 which is attached by conduit 78 to a pressure regulator 79 which, in turn, is attached to a suitable source of air under pressure. The turning of handle 80 permits the fine adjustment of the pressure within housing 71.

In operation, the stops 46 and 55 are placed in a desired position on rail 27. The toggle bolts 72 are loosened and housing 71 removed from the carriage. Nozzle 23 is removed from the carriage. The lid is removed from can 25, and replaced by the piston portion 61 of nozzle 23. The can is then inverted; the nozzle placed in the aperture of the carriage with shoulder 63 engaging carriage 21. Thereafter, the housing 71 is placed on the carriage; the toggle bolts 73 placed in position and flanges 75 tightened to make an air-tight seal. Manual switch 41 is moved to an "on" position and the air pressure adjusted by way of handle 80 to a desired pressure to create a predetermined rate of flow of ink from orifice 59 onto fountain roll 11.

By controlling the pressure within housing 71 and by predetermining the size of orifice 59, the amount of ink flowing from nozzle 23 is controlled. Thus the amount of ink which accumulates in the reservoir between fountain roll 11 and ductor blade 13 need only be a small amount, as illustrated in FIG. 2. The amount of ink flowing onto the roll is readily adjusted by the turning of control 80 of valve 79. The length of travel or of application of the ink on the roll 11 is controlled by the position of stops 46 and 55.

With the foregoing arrangement, it is possible to readily adjust the amount of ink coming from the opening and the length of travel of the carriage. With this arrangement, it is possible to have a minimum residue of ink at all times in the reservoir between the ductor blade and the fountain roll.

It is sometimes an advantage to remove the ink from the original container in which it is supplied by the manufacturer and place the ink in another container. In accordance with an embodiment of this invention, the ink is removed from the original container and placed in a flexible container 315 made, for example, of flexible plastic material. An embodiment for such operations is shown in FIG. 3. This embodiment is generally the same as that of FIG. 1 except that the unit comprised of housing 70 and nozzle 23 of FIG. 1 are replaced by the unit 300 of FIG. 3. Cylindrical housing 301 is secured to carriage 21 by conventional means, such for example, as by welding. Toggle bolts 303 extend from a flange 305 on housing 301. A plate 307 includes slots for the fitting of toggle bolts 303 and a seal 309 provides for the air-tight sealing of container 301. An opening 310 is provided for connection by way of conduit 78 with the valve 79 of FIG. 1. Another opening 312 has on its underside a clamp 314 for securing thereto the bag of ink 315. Thus as the air pressure enters housing 301, it tends to collapse the ink container thereby forcing the ink

through opening 312 into conduit 316 through an aperture in carriage 21 and through a nozzle 318.

FIG. 4 shows the embodiment of FIG. 3 when used with a container 401 for the ink that is of a substantial bellows configuration. Thus as the air pressure is applied to the container, the container tends to collapse thereby forcing the ink through conduit 316 and out through nozzle 318.

FIG. 5 illustrates still another embodiment of the invention. It is generally similar to FIG. 1 except that a different drive mechanism is provided for carriage 21 and a different actuator is provided for cam 25. In this case, the conventional motor 501, which drives the fountain roll 11, also through a reversing gear 513 actuates a lead screw 515 to move carriage 21. This lead screw operating through nuts 517 on slideways 531 on bar 27 travels and reciprocates the carriage 21 axially of fountain roll 11. In this embodiment, the nozzle 23 is identical to nozzle 23 of Example I. However, for housing 71, there is substituted stanchions 520. These stanchions support a rack 523 which is in engagement with a spur gear 525. The spur gear is driven by an electrical motor 527 which may be of conventional, variable speed type. Thus by changing the rate of operation of motor 527, it is possible to change the rate of downward movement of the ink container and thereby the amount of ink applied to fountain rolls 511. In this instance as the limits 46, 45, and 53, 55 are actuated, they actuate reversing gear 517 in a conventional manner rather than reversing starter 51 of FIG. 1.

The foregoing has described a novel arrangement for flowing ink directly onto the fountain roll of a printing press. The ink is deposited on the roll at a metered rate. This rate is established to a degree by the size of the orifice from which the ink issues. Finer adjustments are made by regulating the pressure on the container. This metered rate leaves only a minimum residue in the reservoir after completion of the operation. In fact, this residue can be so small that it does not warrant being put back into the ink can. Thus the length of time required to clean the reservoir is minimized. In addition, the length of the ink film across the fountain roll is readily controlled.

I claim:

1. An ink distributing assembly for a fountain roll comprising: a carriage, a pair of rails slidably supporting said carriage above said fountain roll, one of said rails having teeth thereon and constituting a rack, a pinion gear for engagement with said rack, a motor mounted on said carriage for actuating said gear to move said carriage on said rails, stops on said rails for limiting the movement of said carriage, and reversing means for said motor actuated by said stops whereby said carriage reciprocates axially of said fountain roll on said rails, means for supporting a container of ink on said carriage, and means for flowing ink from said container onto said fountain roll at a predetermined rate.

2. An assembly for distributing ink from a container onto the fountain roll of a press comprising: a carriage, a pair of rails slidably supporting said carriage above said fountain roll, one of said rails having teeth thereon and constituting a rack, a pinion gear for engagement with said rack, a motor mounted on said carriage for actuating said gear to move said carriage on said rails, stops on said rails for limiting the movement of said carriage, and reversing means for said motor actuated by said stops whereby said carriage reciprocates axially of said fountain roll on said rails, means for supporting a container of ink on said carriage, and dispensing means for flowing ink from said container onto said fountain roll at a predetermined rate including a hollow tubular member terminating at one end in the orifice and at the other end in a piston adapted to fit within said container, means for moving said container relative to said piston whereby the ink from said container is forced through said orifice at a predetermined rate onto said fountain roll.

5

3. An ink distributing assembly for flowing ink from a collapsable container onto a fountain roll comprising: a carriage, a pair of rails slidably supporting said carriage above said fountain roll, one of said rails having teeth thereon an constituting a rack, a pinion gear for engagement with said rack, a motor mounted on said carriage for actuating said gear to move said carriage on said rails, stop on said rails for limiting the movement of said carriage, and reversing means for said motor actuated by said stops whereby said carriage reciprocates axially of said fountain roll on said rails, means for supporting a container of ink on said carriage, and means for flowing ink from said container onto said fountain roll at a predetermined rate including means for collapsing said container to flow ink therefrom, and means for conducting the flow of ink onto said fountain roll.

5

10

15

6

References Cited by the Examiner

UNITED STATES PATENTS

1,222,759	4/17	Hawkins	141—233	X
1,555,136	9/25	Malaguti	101—350	X
1,598,759	9/26	Wilson	101—366	
1,670,062	5/28	Carroll	101—350	X
2,178,816	11/39	Sibley	222—162	X
2,267,596	12/41	Montague et al.	101—123	
2,599,071	6/52	Schwarz	222—320	
2,800,155	7/57	Foreman	239—186	X
2,839,970	6/58	Gaffney	239—186	X
2,847,249	8/58	Evans	239—323	
2,890,652	6/59	Jauch et al.	101—366	X
3,000,300	9/61	Ortleb	101—364	
3,065,886	11/62	Smalley	101—366	X

ROBERT E. PULFREY, *Primary Examiner.*EUGENE R. CAPOZIO, *Examiner.*