

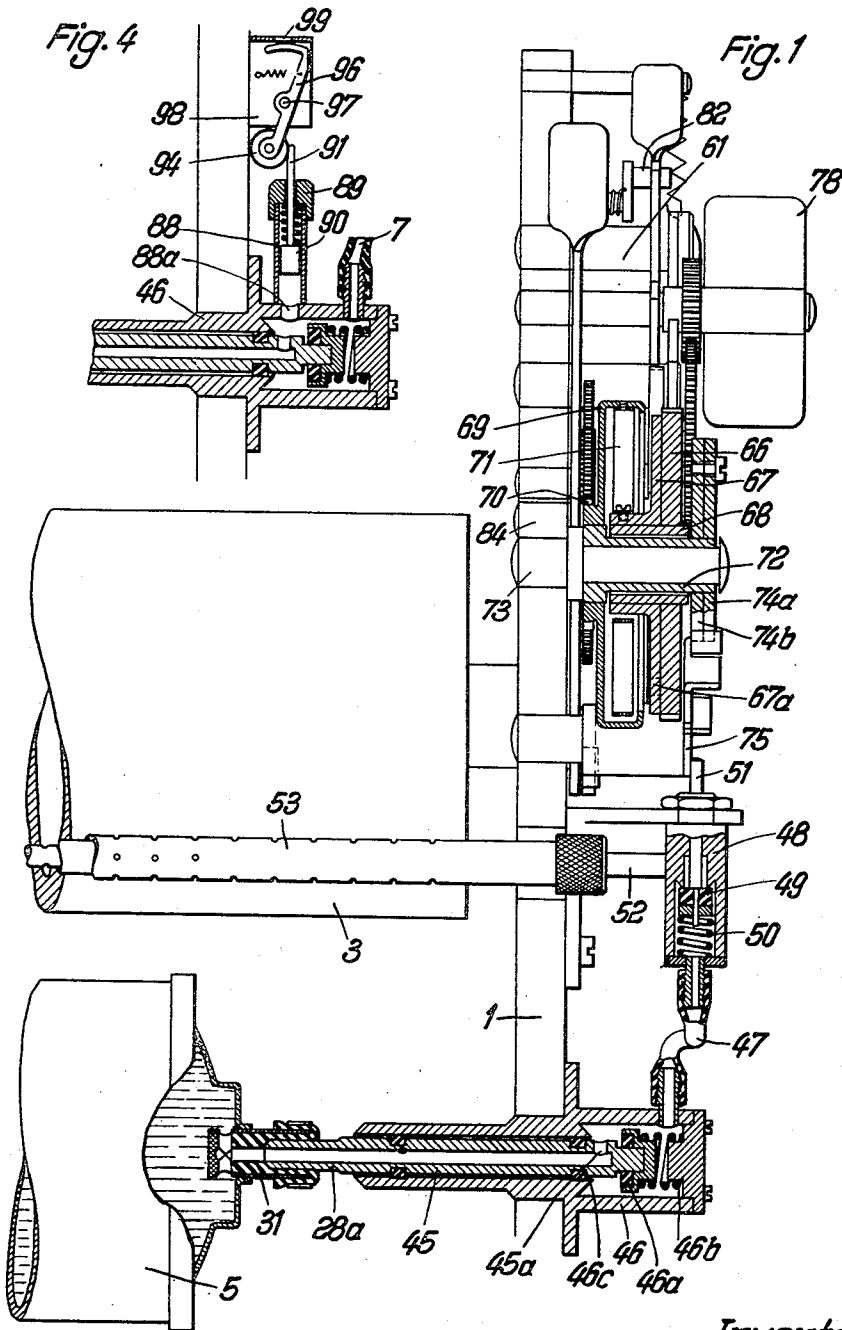
June 21, 1960

960 M. JAUCH ET AL 2,9
APPARATUS FOR INKING THE INK ROLLER OF A PRINTING
MACHINE, PARTICULARLY STENCIL
DUPLICATING MACHINES
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2 Sheets-Sheet 1



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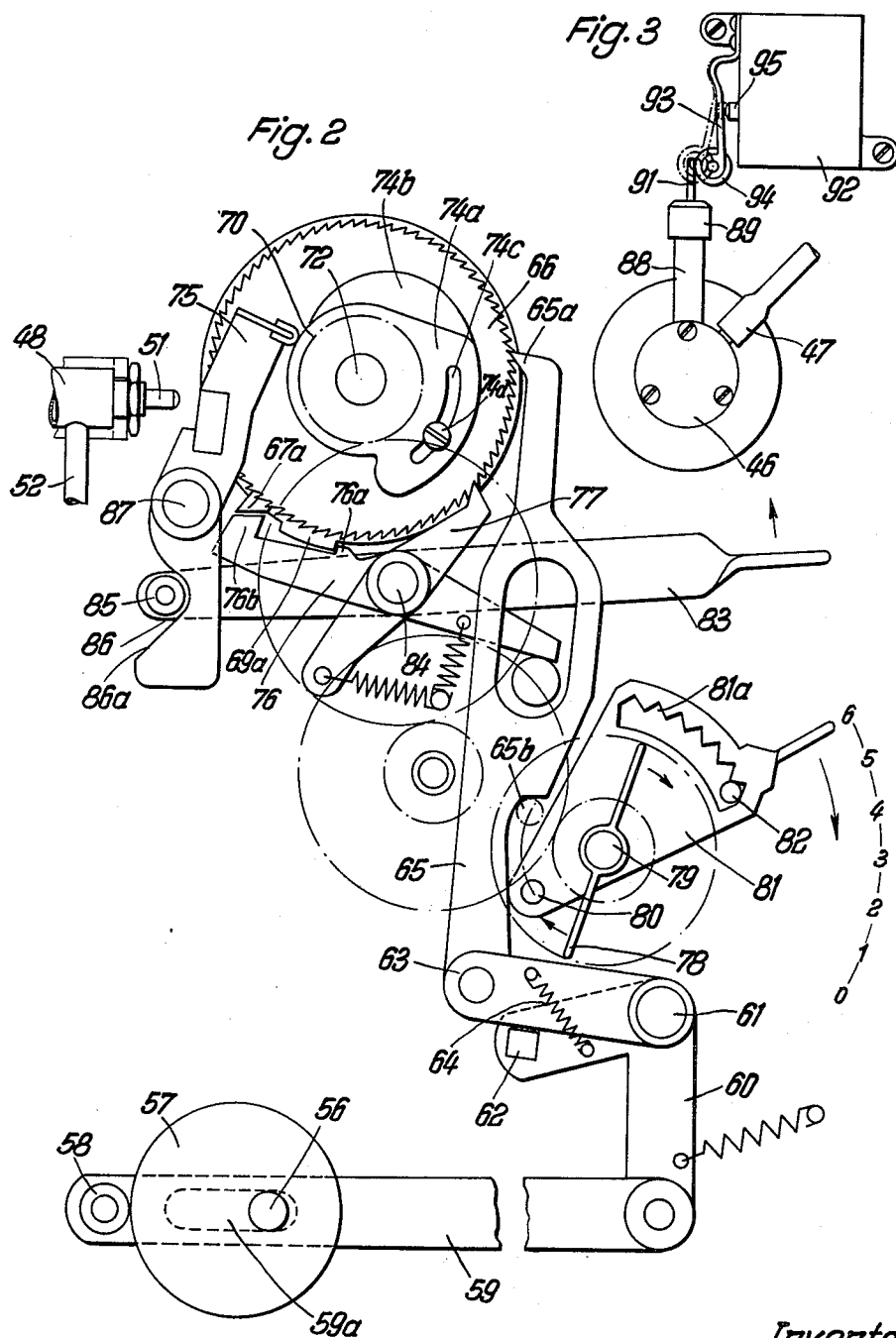
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2 Sheets-Sheet 2



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APPARATUS FOR INKING THE INK ROLLER OF A PRINTING MACHINE, PARTICULARLY STENCIL DUPLICATING MACHINES

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4 Claims. (Cl. 101-366)

The subject of a prior application Ser. No. 492,096, now U.S. Patent No. 2,890,652, is an inking device for printing machines, particularly stencil duplicating machines, wherein a nozzle supplying the ink is connected to an automatic ink supply and the ink is supplied by means of a pressure container with propellants, known in itself, in which, for example, separated by a piston, is contained, on the one side the ink and on the other side a liquid propellant, e.g. propane, butane, frigen (difluorodichlormethane) or the like, which vaporizes at room temperature and produces a pressure which, by displacing the piston, drives the ink out of the pressure container, which is connected to the nozzle supplying the ink to the roller to be inked, and that said nozzle can be displaced along the ink roller by means of a handle. The handle, by means of which the nozzle is displaced along the ink roller, also serves at the same time to operate the device for opening and closing the nozzle valve.

During the whole duplicating run, this inking device has to be watched continuously and controlled by means of the handle, i.e. the nozzle has to be set to the position to be inked and the nozzle valve opened and closed, by hand all the time.

It is the object of the invention to provide an improvement in this direction. It provides an automatic control device for opening and closing a valve, the inking width being set previously by means of an ink distributor tube. As a result it is possible to leave the machine during the whole working operation without watching it and without manual attention, particularly if, in accordance with the invention, a device is provided, which, when the ink container is completely empty, stops the machine or indicates the complete emptying of the container.

The device according to the invention preferably works in such a manner that a mechanically driven control mechanism sets a power accumulator, e.g. a spring drive and releases it at preselected intervals of time and for a preselected period by control means.

It is true that inking devices are already known which comprise a control mechanism which is actuated by the rotation of the drum, and which turns a movable dog through a specific angle each time and after a certain number of revolutions of the drum brings it into a position in which the dog sets in action the inking mechanism which is again automatically disconnected from the drive of the inking mechanism after one revolution of the drum. Nevertheless, such an arrangement is unsuitable in conjunction with selfemptying ink containers because here, if there is any interruption in the duplicating process, the dog might remain in a position in which it had opened the valve and the ink would flow out uninterruptedly until the ink container was completely empty.

The invention is not limited to devices for supplying ink and may be used anywhere where a fluid working medium is supplied from a storage container and the supply has to be controlled, e.g. the moistening fluid in hectographic reproduction devices.

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The drawing shows one embodiment of the invention by way of example.

Figure 1 illustrates the inking device in conjunction with the control device in plan, partly in section.

Figure 2 shows the control device and its drive in front elevation.

Figure 3 represents an automatic on-off device, and Figure 4 shows an indicator device for use on manually operated machines.

As in the prior application, 5 is the ink container, the construction and operation of which is described in the prior application. The ink container is provided with a closure 31 the action of which is likewise described in more detail in the prior application, and which can be opened by the introduction of a piston-like extension 28a when the container is inserted in the inking device of the machine. As distinct from the embodiment in the prior application, this extension 28a is attached to a hollow valve stem 45, which is located in the valve body 46. As already mentioned, the valve stem is hollow and when the container is fitted to the machine it is in communication with the interior of the container through the closure 31. The bore of the valve stem 45 is in communication, through an aperture 45a with a hollow chamber provided at the head of the valve body 46. At the end projecting into this chamber, the valve stem carries a valve disk 46a, which is urged against the valve seating 46c by means of a spring 46b. Accordingly, so long as the ink container is not in position, the spring 46b urges the valve disk against its seating 46c and shuts off the body. After the container has been fitted in position, however, it is in communication through the bore 45a with the interior of the chamber in the head of the body, so that the latter fills with ink. The ink passes on through the pipe 47 and reaches the valve body 48 in which is provided a plunger 49, which is held against its seating under the influence of the compression spring 50 and consequently prevents the ink from flowing further. The plunger 49 is mounted on a rod 51 which projects through the valve body and serves to control the plunger, i.e. to open and close the valves 48 and 49.

The control, which will now be described in detail, is arranged in such a manner as to control the time during which the valve is open.

The control is driven (Figure 2) by the main shaft 56 of the machine, on which a driving disc 57 is mounted eccentrically. Engaged around the shaft 56 is a rod 59 provided with a slot 59a, one end of said rod carrying a roller 58 engaging the eccentric disc 57, while the second end of said rod is articulated to an angle lever 60 which is mounted on a pivot 61 fixed to the machine frame. Mounted on the second arm of the angle lever 60 is a square pin 62 which engages under a lever 63 which is rotatable about the pivot 61 and rests freely on the pin 62. A spring 64 holds the lever 63 in abutment against the square pin 62.

The free end of the lever 63 is connected to a control rod 65, of which the upper pawllike end 65a engages in a ratchet wheel 66. The ratchet wheel is prevented from turning backwards, i.e. in clockwise direction in Figure 2, by means of a pawl 77.

Since the shaft 56, and with it the eccentric disc 57, runs uninterruptedly, the angle lever 60 is constantly rocked backwards and forwards. Accordingly, the control rod 65 is raised once for each revolution of the shaft 56, and consequently moves the ratchet wheel 66 on a step. The spring 64 acts as a flexible connection between the lever 63 and the angle lever 60 and prevents the device from jamming if the control rod 65 is prevented from moving downwards.

The control mechanism 65, 66 serves to wind up a spring 71 housed in a casing 69 (Figure 1). For this

purpose, the ratchet wheel 66 is rigidly connected to a disc 67, which carries a cam 67a (Figure 2). The two discs 66 and 67 are mounted on a sleeve 68 which in turn is freely mounted on a second sleeve 72. The latter is mounted for free rotation on a pivot 73 which is fixed in the machine frame. The sleeve 72 carries the spring casing 69, which is provided with a ring of teeth 70. The spiral spring 71 mounted in the spring casing is fixed at one end to the spring casing 69 and at the other end to the disc 67, so that when the ratchet wheel 66 is turned, the spring 71 is tensioned by the control rod 65 and the consequent rotation of the disc 67.

Also mounted on the sleeve 72 are two cam discs 74a and 74b, which are adjustable in relation to one another as a result of the fact that the one cam disc 74a is provided with a slot 74c concentric with the centre of rotation, through which there engages a screw 74d set in the disc 74b. By displacing these two discs in relation to one another the larger diameter peripheral surface of the two discs is varied. Resting against the two discs is a control lever 75 which pivots about a pin 87. According to the setting of the two discs 74a and 74b, that is to say according to the length of the larger diameter peripheral surface, the control lever 75 is held swung out to the left in Figure 2, for a longer or shorter period during the rotation of the discs. On swinging out, the control lever 75 rests against the rod 51 and controls the valves 48, 49. Thus so long as the control lever is held swung out to the left by the discs 74a, 74b, ink flows out, while the rod returns to the position in which the valve is closed as soon as it rests on the lower portion of the cam discs 74a, 74b.

The method of operation of this control device is therefore as follows:

As a result of the rotation of the disc 57 and the reciprocation of the connecting rod 59, the spring 71 is tensioned in the spring casing in the manner described above through the control rod 65, the ratchet wheel 66 and the disc 67. During each downward movement of the control rod 65, the pair of discs 66, 67 is locked by the pawl 77. The cam disc 67, carrying the cam 67a turns with the ratchet wheel 66 and, as already mentioned, at the same time tensions the spring 71, while the spring casing 69 is held against movement. For this purpose it carries a boss 69a (Figure 2), which rests against a stop 76a on a stop lever 76. Like the pawl 77, the stop lever 76 pivots about the shaft 84. But if, during the rotation of the ratchet wheel 66 and the cam disc 67, the cam 67a has reached the control dog 76b on the stop lever 76, then said lever turns in counterclockwise direction and thus releases the stop 76a from the boss 69a. Consequently, the spring casing 69 is turned under the influence of the spring which has been tensioned in the meantime, and takes with it the control discs 74a and 74b which are connected to it by means of the sleeve 72. The parts perform one revolution, until the boss 69a again strikes against the stop 76a. This process is repeated each time the ratchet wheel 66 makes one complete revolution and has tensioned the spring, and the release cam 67a actuates the stop lever 76. During the rotation of the cam discs 74a and 74b, these act on the control lever 75, which, as already mentioned, forces in the valve piston rod 51 for the pre-set period and during this time, removes the plunger 49 from its seating so that the ink passes into the pipe 52 and from thence into the distributor tube 53. From the distributor tube, the ink is transferred to the drum 3 of the duplicating machine.

Instead of two cam discs 74a and 74b, which are adjustable in relation to one another, it is, of course, possible to provide three or more such discs which are adjustable in relation to one another, or to make the discs interchangeable so as to provide a greater range of setting.

In order to obtain a uniform flow of ink, regardless of the tension of the spring at the beginning and end of

the inking, it is advisable to brake the unwinding of the spring 71 by means of brake vanes 78. The vanes are mounted on a pivot 79 fixed to the machine frame and are connected by gearing to the spring casing. For this purpose, the latter has the toothed ring 70.

In addition to the setting of the duration of the ink supply, the time sequence of the individual inking operations can also be set. For this purpose, the control rod 65 is provided with a shoulder 65b against which a stop pin 80 can rest. The stop pin 80 is adjustable. It is fixed to a lever 81 which can rock about a pivot 79 and comprises an arcuate slot 81a. One surface of this slot is toothed and a resilient stop 82 rests against it. The lever 81 can be set in various positions by means of the handle provided thereon, engagement in one of the successive tooth-like incisions taking place. With a setting in the position marked O, the stop pin 80 is in its uppermost position. It then holds the control rod 65 in the uppermost position, and the control mechanism does not move on at all, i.e. the device is out of action. With a setting to one of the Figures 1 to 6, a smaller or greater movement of the control rod 65 is possible, and as a result a faster or slower moving on of the ratchet wheel 66, and accordingly a more or less rapid winding up of the spring and initiation of the individual inking operations.

In addition to the automatic inking described, it is also possible to effect the ink supply by hand, e.g. if a particularly strong application of ink is required at individual points. For this purpose, there is provided a hand lever 83, which is likewise rockable about the pivot 84 and carries at its end a roller 85 which engages in a depression 86 in an extension of the second arm of the control lever 75 which is constructed in the form of a double lever. As a result of lifting the hand lever 83, the roller 85 runs up the ramp 86a, rocks the control lever 75 in counterclockwise direction in consequence, and opens the ink valve. The ink continues to flow as long as the lever 83 is raised, that is to say if necessary, even at a time when the lower portion of the cam discs 74a, 74b is opposite the stop lever 75.

In order to prevent the machine from continuing to run when the ink container 5 is completely empty, a nipple 88 may be mounted on the valve body 46, as shown in Figure 4, being closed at the top by a cap 89. The nipple is in communication through an aperture 88a in the valve body with the interior of the latter. In the nipple 88 moves a piston 90 which is urged upwards, by the pressure prevailing in the pipe, against the force of a spring. The piston carries a piston rod 91, which passes through a bore in the cap 89. If the ink container 55 is empty, or there is no ink container applied to the nipple, then there is no pressure in the ink supply line and the piston 90 is urged downwards by the spring, in which case the piston rod 91 no longer projects above the cap 89.

As shown in Figure 3, the piston rod 91 can serve to actuate a switch 92. For this purpose, a spring 93 which carries the roller 94 is provided on the switch housing. The piston rod 91 rests against this roller when there is ink in the valve body and this has urged the piston 90 upwards into the position shown in Figures 3 and 4, against the action of its spring. As a result, the spring 93 acts against the contact pin 95 and actuates a control magnet for the machine drive or for the sheet layer-on. By this means, the machine no longer works, when the pressure ceases in the ink supply.

In addition to this safety device, it is advisable for an acoustic or light signal (e.g. an indicator lamp) to be actuated, as shown, for example, in Figure 4. Here the piston rod 91 acts against a roller 94 on a double lever 96 pivoting about the pin 97, and urged against the rod 91 by means of a spring. As the free upper end, the lever 96 has a plate, the surfaces of which are provided with two different markings, one or the other

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of which appears before a window 99 on the housing 98 enclosing the device, according to the position of the lever 96. The device can also be used to switch on an acoustic signal in a manner known per se.

The invention is described above in conjunction with an inking device for a stencil duplicating machine. It may also be used, however, for machines of other types, e.g. for the moistening mechanism of offset and printing machines, in which case a distributor tube with spray nozzles is used instead of the ink distributor tube with holes, and the moistening agent is sprayed onto the former using the pressure available in the pressure container, and here again the distribution of the fluid can be set to the required width before work commences.

We claim:

1. An inking device for inking the rotating ink roller of a printing machine, particularly a stencil duplicating machine, comprising a nozzle for discharging ink onto the roller, a container for the ink and for a liquid propellant, means for connecting said container to said nozzle for supplying ink thereto, the propellant vaporizing at room temperature and producing and maintaining a constant pressure in the container to force ink out of the container through said connecting means to said nozzle, said connecting means comprising a connecting pipe and a valve controlling the ink supply from the said pipe to the nozzle, adjustable means coacting with said valve for controlling said valve to allow and prevent respectively the ink to be supplied to said nozzle independently of the pressure within said container and for preselected periods and at preselected intervals of time, means for adjusting said adjustable means, said adjustable means comprising a power accumulator, and means for periodically charging and releasing said accumulator at preselected intervals of time and for preselected periods.

2. An inking device for inking the rotating ink roller of a printing machine, particularly a stencil duplicating machine, comprising a nozzle for discharging ink onto the roller, a container for the ink and for a liquid propellant, means for connecting said container to said nozzle for supplying ink thereto, the propellant vaporizing at room temperature and producing and maintaining a constant pressure in the container to force ink out of the container through said connecting means to said nozzle, said connecting means comprising a connecting pipe and a valve controlling the ink supply from the said pipe to the nozzle, adjustable means coacting with said valve for controlling said valve to allow and prevent respectively the ink to be supplied to said nozzle independently of the pressure within said container and for preselected periods and at preselected intervals of time, and means for adjusting said adjustable means, the means for controlling the said valve to open at preselected intervals comprising a step-by-step control mechanism, an operating rod provided to move said control mechanism, a stop pin engaging in the path of the said operating rod to limit its path, and a setting lever for

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setting said stop pin in various positions to lengthen or shorten its path as desired.

3. An inking device for inking the rotating ink roller of a printing machine, particularly a stencil duplicating machine, comprising a nozzle for discharging ink onto the roller, a container for the ink and for a liquid propellant, means for connecting said container to said nozzle for supplying ink thereto, the propellant vaporizing at room temperature and producing and maintaining a constant pressure in the container to force ink out of the container through said connecting means to said nozzle, said connecting means comprising a connecting pipe and a valve controlling the ink supply from the said pipe to the nozzle, adjustable means coacting with said valve for controlling said valve to allow and prevent respectively the ink to be supplied to said nozzle independently of the pressure within said container and for preselected periods and at preselected intervals of time, means for adjusting said adjustable means, the said adjustable means comprising a power accumulator and means for periodically charging and releasing it at preselected intervals of time and for preselected periods, and brake vanes connected with the power accumulator and adapted to brake and equalize its control operations.

4. An inking device for inking the rotating ink roller of a printing machine, particularly a stencil duplicating machine, comprising a nozzle for discharging ink onto the roller, a container for the ink and for a liquid propellant, means for connecting said container to said nozzle for supplying ink thereto, the propellant vaporizing at room temperature and producing and maintaining a constant pressure in the container to force ink out of the container through said connecting means to said nozzle, said connecting means comprising a connecting pipe and a valve controlling the ink supply from the said pipe to the nozzle, adjustable means coacting with said valve for controlling said valve to allow and prevent respectively the ink to be supplied to said nozzle independently of the pressure within said container and for preselected periods and at preselected intervals of time, and means for adjusting said adjustable means, said adjustable means including a power accumulator operative to be periodically charged and released at preselected intervals of time and for preselected periods.

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