

March 29, 1966

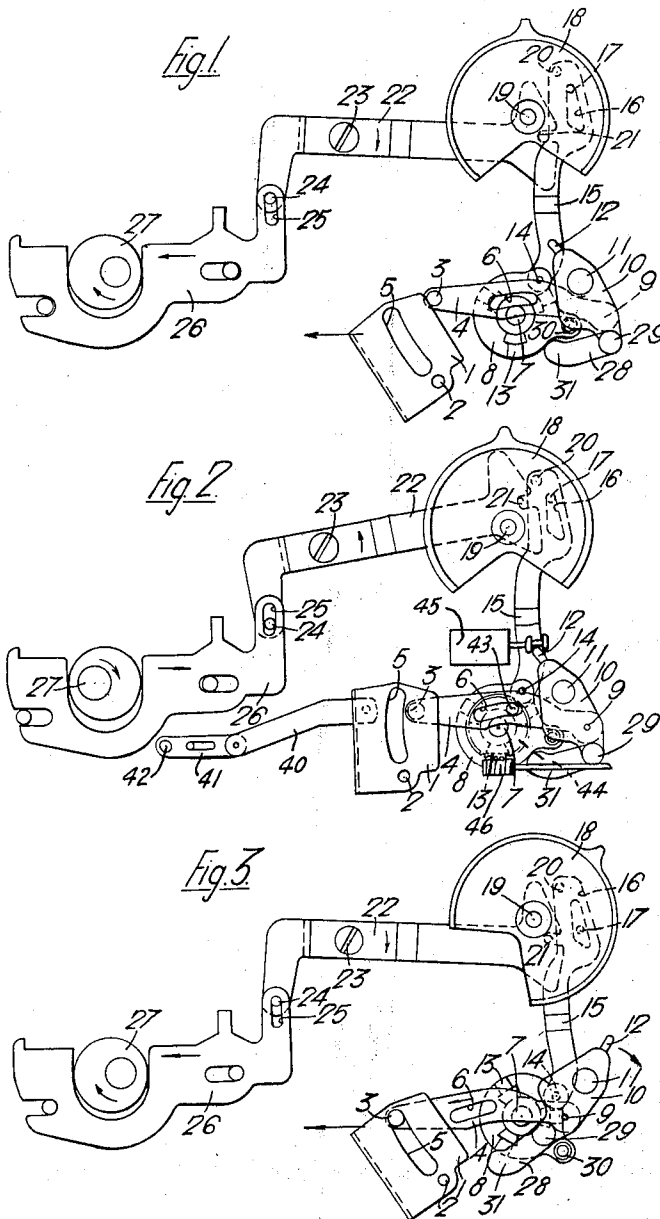
A. G. R. GATES

3,242,860

AUTOMATIC INKING MECHANISM FOR STENCIL DUPLICATORS

Filed Dec. 9, 1963

2 Sheets-Sheet 1



Inventor

Albert G. R. Gates

By
Stevens, Davis, Miller & Mosher
Attorneys

March 29, 1966

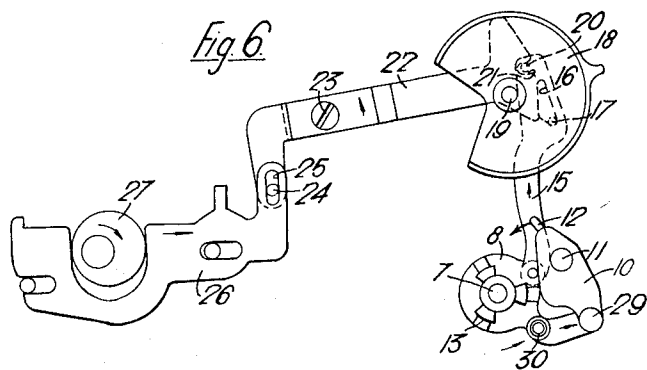
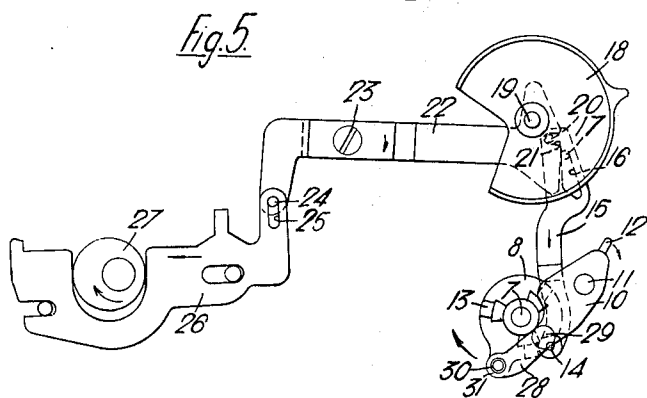
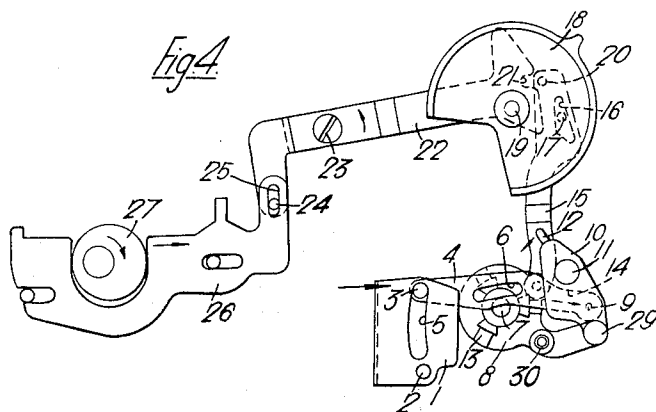
A. G. R. GATES

3,242,860

AUTOMATIC INKING MECHANISM FOR STENCIL DUPLICATORS

Filed Dec. 9, 1963

2 Sheets-Sheet 2



Inventor

Albert G. R. Gates

By

Stevens Davis Miller & Mosher
Attorneys

1

2

3,242,860 AUTOMATIC INKING MECHANISM FOR STENCIL DUPLICATORS

Albert George Ronald Gates, Edmonton, London, England, assignor to Gestetner Limited, London, England, a British company

Filed Dec. 9, 1963, Ser. No. 328,992

Claims priority, application Great Britain, Dec. 28, 1962, 48,855/62

1 Claim. (Cl. 101—366)

This invention relates to automatic inking mechanism for stencil duplicators, and, in particular, to such inking mechanism suitable for use with two cylinder duplicating machines in which ink is applied to a stencil by means of a distributor located between the two cylinders.

During use of a duplicator, ink is usually applied automatically, although on certain occasions it is necessary manually to apply the ink to the cylinders. Thus, it is necessary to charge the cylinders with ink prior to fitting a stencil and occasionally to supplement, in at least certain areas of the stencil, the amount of ink supplied by the automatic inking mechanism. The specification of my Patent No. 2,787,216 describes such a mechanism in which a lever is manually operable to disconnect the normal automatic drive to an ink pump and manually to operate the pump to supply ink to the distributor of the duplicating machine.

It is an object of the present invention to provide an automatic inking mechanism in which a manually operable control is operative for disconnecting a normal drive to the ink pump and coupling a supplementary drive from the machine to the ink pump, and which is also effective to limit the amount of ink which can be applied during each copying operation by the supplementary drive.

According to the invention there is provided an inking mechanism for a stencil duplicator comprising a variable stroke piston pump for withdrawing a charge of ink from a container and delivering it to the ink distributor of the duplicator during a copying operation of the duplicator, means for driving the pump with the duplicator for automatic delivery, and manually actuable mechanism for disengaging the automatic drive and connecting a supplementary drive to the pump whereby the pump may carry out a full delivery stroke powered by the duplicator during a copying operation. Preferably the pump is so operable that during normal automatic operation each delivery stroke comprises a succession of charge delivering steps.

Conveniently, as described in the specification or my above-mentioned patent, the automatic drive means may comprise a lever, a first means engaging the lever to swing it about the fulcrum and a second means engageable with the lever for transmitting reciprocatory motion therefrom to the pump, the engagement of one of these means with the lever being at an adjustable distance from the fulcrum to vary the amplitude of the reciprocatory motion. Desirably the first means is a reciprocatory link connected to a rotary cam and follower mechanism in driven connection with the duplicator drive while the second, adjustable, means comprises a reciprocatory link having a pin engageable in a slot in the lever, the reciprocatory link being carried by a member which can be adjustably positioned to alter the position of the pin in the slot. In a particularly convenient form of the adjustment the member is rotatably mounted about a fixed axis extending generally perpendicularly of the reciprocatory link and is provided with a pin, spaced from this axis, which engages a slot extending generally longitudinally of the reciprocatory link. In this way, simply by rotation of the member about the axis, the reciprocatory link can be adjustably positioned to vary the amount by which it is reciprocated by movement of the lever. As reciprocation

of the link directly operates the ink pump, adjustment of the stroke of the link causes a corresponding adjustment of the stroke of the ink pump and thus controls the charge of ink supplied to the distributor during each operating cycle of the duplicator. In order accurately to control the charge of ink supplied by the ink pump it is preferred to control the angular position of the member supporting the reciprocatory link by a worm and wheel drive. By providing a suitable dial for rotating the worm the operator can be given extremely accurate control over the quantity of ink supplied automatically to the cylinders of a duplicating machine during each copying operation.

The automatic drive can be simply disconnected by mounting the member, and the reciprocatory link carried thereby, for movement along the axis about which the member is rotatable whereby upon such axial movement of the member the pin on the reciprocatory link engaging in the slot in the lever may be simply retracted from such engagement. It is preferred that the axial position of the member carrying the link may be controlled by the relative rotational positioning of a second member rotatably mounted about the same axis as the first member. This may be done by arranging the second member as a cam plate contacting the first member directly to control the axial position thereof, or by arranging the second member with a helix engageable by part of the first member.

The manually actuable mechanism of a preferred embodiment of the present invention comprises a three-position switch connected by means of a link to the second member whereby reciprocation of the link causes rotation of the second member with consequent axial movement of the first member and the reciprocatory link supported thereon. In a first, off, position of the switch the connecting link is so positioned that the pin on the reciprocatory link is withdrawn from the slot in the lever. In a second, automatic, position of the switch the connecting link is so positioned as to cause the pin on the reciprocatory link to be engaged with the slot in the lever whereby movement of the lever causes normal automatic operation of the ink pump. In a third, powered manual, position of the switch the connecting link is positioned to cause the pin on the reciprocatory link to be held out of engagement with the slot in the lever while at the same time the connecting link is reciprocated by a supplementary or boost idler link to cause a reciprocatory rotational movement of the second member. The second member is provided with a lost motion connection with a drive for the ink pump, whereby this reciprocatory rotational movement causes full stroke operation of the ink pump. The boost idler link is so driven by the duplicating machine drive that the connecting link is reciprocated once during each copying operation while the switch is in its powered manual position. Preferably the switch is spring loaded so that it has to be held manually in its third position and that it immediately returns to its second position upon release.

A particular construction example of the invention will be described, merely by way of example, with reference to the accompanying drawings in which FIGURES 1 and 2 diagrammatically illustrate part of the inking control mechanism with the switch in its off-position, FIGURES 3 and 4 are similar to FIGURES 1 and 2 but with the switch in its automatic position, and FIGURES 5 and 6 illustrate the arrangement with the switch in its powered manual position.

FIGURES 1, 3 and 5 show the mechanism at the start of a copying operation whilst FIGURES 2, 4 and 6 show the mechanism half-way through the copying operation.

Referring to the drawings, an inker cam lever 1 is pivotable about a pin 2 by means of a reciprocatory link 40 pivoted (as shown in FIG. 2) at one end to the lever 1 and at the other end to a cam follower 41 having a fol-

3

lower roller 42 as described in the specification of my above-mentioned patent whereby the pump is operable to give a succession of charge delivering steps during each delivery stroke. A pin 3 mounted on the end of a reciprocatory link 4 is engageable in a slot 5 in the lever 1. The reciprocatory link 4 is provided with a generally lengthwise extending slot 6 and is supported upon a member 44 (FIG. 2) by means of a pin 43 extending into the slot 6. This member 44 is mounted for rotation and for axial sliding movement on a shaft 7 extending generally perpendicular to the link 4. As shown in FIG. 2 the member 44 is rotationally positionable by means of a worm 46 engaging gear teeth on the periphery of the member 44. Also mounted for rotation about the shaft 7 is a second member 8 which is, however, held against movement axially of the shaft. The end of the link 4 remote from the pin 3 is pivoted at 9 to a plate 10 pivotable about a fixed pivot 11. An extension 12 of this plate 10 is engageable with an ink pump 45 (FIG. 2) whereby pivotable movement of the plate 10 causes reciprocatory movement of the piston of the ink pump. The second member 8 is provided with cam surfaces 13 whereby rotation of the second member relative to the first member causes axial movement of the first member due to engagement of the first member with the cam surfaces. In an alternative arrangement the second member may comprise a helix engaged by part of the first member for causing the axial position of the first member to be controlled by the rotational position of the second member.

Pivoted to the second member at 14 is a generally vertically extending connecting link 15 provided near its upper end with a generally triangular slot 16 receiving a pin 17 carried by a switch 18. The switch 18 is rotatably mounted at 19 for movement between an off-position shown in FIGURE 1, an automatic position shown in FIGURE 3, and a powered manual position shown in FIGURE 5. In the powered manual position of the switch a pin 20 at the upper end of the connecting link 15 is engageable with a recess 21 at the end of a boost idler link 22 mounted upon a fixed pivot 23. The opposite end of the idler link is provided with a pin 24 engaging in a slot 25 in a slide 26 reciprocable by an eccentric 27 connected with the duplicating machine drive.

A lost motion connection is provided between the second member 8 and the plate 10 by means of an arm 28 pivoted at 29 to the plate, and pin 30 projecting from the second member is engageable with a part cylindrical projection from the end 31 of the arm 28, this projection not being shown in the drawings.

During operation of the machine, when the switch is in the off-position as shown in FIGURES 1 and 2, the pin 17 holds the connecting link in an upper position against the action of a spring, not shown. In this position the second member 8 holds the first member in such a position that the pin 3 is held out of engagement with the slot 5 whereby the lever 1 is moved by the machine drive without causing any movement of the link 4 and the consequent movement of the extension 12 on the plate 10 for operating the ink pump. At the same time, the slide 26 is reciprocated during each copying operation of the duplicator while the resultant movement of the idler link 22 is not transmitted to the connecting link 15 due to the pin 20 being held in a position spaced from the recess 21.

Upon turning of the switch 18 to its automatic position, the pin 17 is moved downwardly to the right, as shown in FIGURE 3, permitting the connecting link to move downwardly and at the same time moving the pin 20 laterally to a position such that it is not engageable in the recess 21. Due to the downward movement of the connecting link the second member 8 is rotated clockwise to a position such that the pin 3 engages in the slot 5 whereby movement of the lever 1 is automatically transmitted to the plate 10 and thence to the ink pump. Preferably the

4

means for pivoting the lever 1 is that described in the specification of my above-mentioned patent whereby the plate 10, and thus the piston of the ink pump 45, is moved in a succession of incremental steps during each copying operation of the duplicator, several of these incremental charge dispensing steps made up each stroke of the ink pump.

Upon movement of the switch 18 to its powered manual position shown in FIGURE 5 the pin 17 is moved downwardly to the left so as to be engageable in the recess 21 at the end of the idler 22. At the same time the downward movement causes the pin 3 on the reciprocatory link 4 to be withdrawn from the slot 5 in the lever 1. The engagement of the pin 20 in the recess 21 causes the reciprocatory sliding movement on the slide 26 to be converted into a generally vertical reciprocatory movement of the connecting link 15. This movement of the connecting link 15 causes an oscillating rotational movement of the second member 8 about the shaft 7 whereby upon each oscillating movement the plate 10 is moved between its extreme positions by the lost motion connection provided by the arm 28 and the pin 30. Suitable springs are, of course, provided for holding the arm 28 in a position to be engageable by the pin 30 and for moving the plate 10 anti-clockwise about the pivot 11 between the positions shown in FIGURES 5 and 6. As the connecting link 15 is moved upwardly by the idler link 22 it causes return of the member 8 to the automatic position and re-engages the pin 3 in the slot 5. The switch 18 is preferably movable between the automatic and powered manual positions against the action of a spring whereby the switch is biased to return to the automatic position immediately upon release. By keeping the switch 18 depressed further charges of ink are applied to the cylinder at the rate of one per revolution until release of the switch.

I claim:

In an inking mechanism for a stencil duplicator having a variable stroke piston pump for withdrawing a charge of ink from a container and delivering it to the ink distributor of a duplicator during a copying operation of the duplicator, the improvement comprising automatic drive means for driving the pump with the duplicator for automatic delivery, such automatic drive means comprising a lever, a flucrum pivotally supporting said lever, a first means engaging said lever for swinging it about said flucrum in response to operation of said duplicator, and second means engageable with said lever for transmitting reciprocating motion therefrom to said pump, such second means being adjustable and including a reciprocatory link, a pin mounted on said reciprocatory link, a slot in said lever engageable by the pin, a member carrying said reciprocatory link, said member being mounted for rotation about a fixed axis extending substantially perpendicular to said reciprocatory link, the means carrying said reciprocatory link on said member comprising a pin on said member spaced from said axis and a slot extending generally longitudinally of the reciprocatory link and engaged by said last mentioned pin, a second member mounted for rotation about the same axis as said first member and means for controlling the axial position along said axis of the member carrying the link by the relative rotational position of said second member; a supplementary drive adapted to be connected to the pump and powered by the duplicator; and manually actuable mechanism for disengaging the automatic drive and connecting the supplementary drive whereby the pump may carry out a full delivery stroke powered by the duplicator during a copying operation, said manually actuable mechanism including a three position switch, a link connecting the switch to the second member whereby reciprocation of the link by operation of the switch is adapted to cause rotation of said second member with consequent axial movement of the first member and the reciprocatory link

5

carried thereon, and said supplementary drive comprising driven means powered by the duplicator drive and a boost idler link structurally connected to said driven means, said switch, in its powered manual position causing connection of the boost idler link with said connecting link between the switch and said second member for causing an oscillatory rotational movement of said second member responsive to reciprocatory motion of said boost idler link, the connecting link between the switch and the second member being so positioned when the switch is in its powered manual position that the pin on the reciprocatory link of the automatic drive is held out of engagement with the slot in the lever, the second member being

6

provided with a lost motion connection to an ink pump drive whereby the ink pump is operable with a full stroke in response to said oscillatory rotational movement.

References Cited by the Examiner**UNITED STATES PATENTS**

2,787,216 4/1957 Gates ----- 101—366

ROBERT E. PULFREY, *Primary Examiner.*EUGENE R. CAPOZIO, *Examiner.*JULIUS R. FISHER, *Assistant Examiner.*