

Oct. 9, 1962

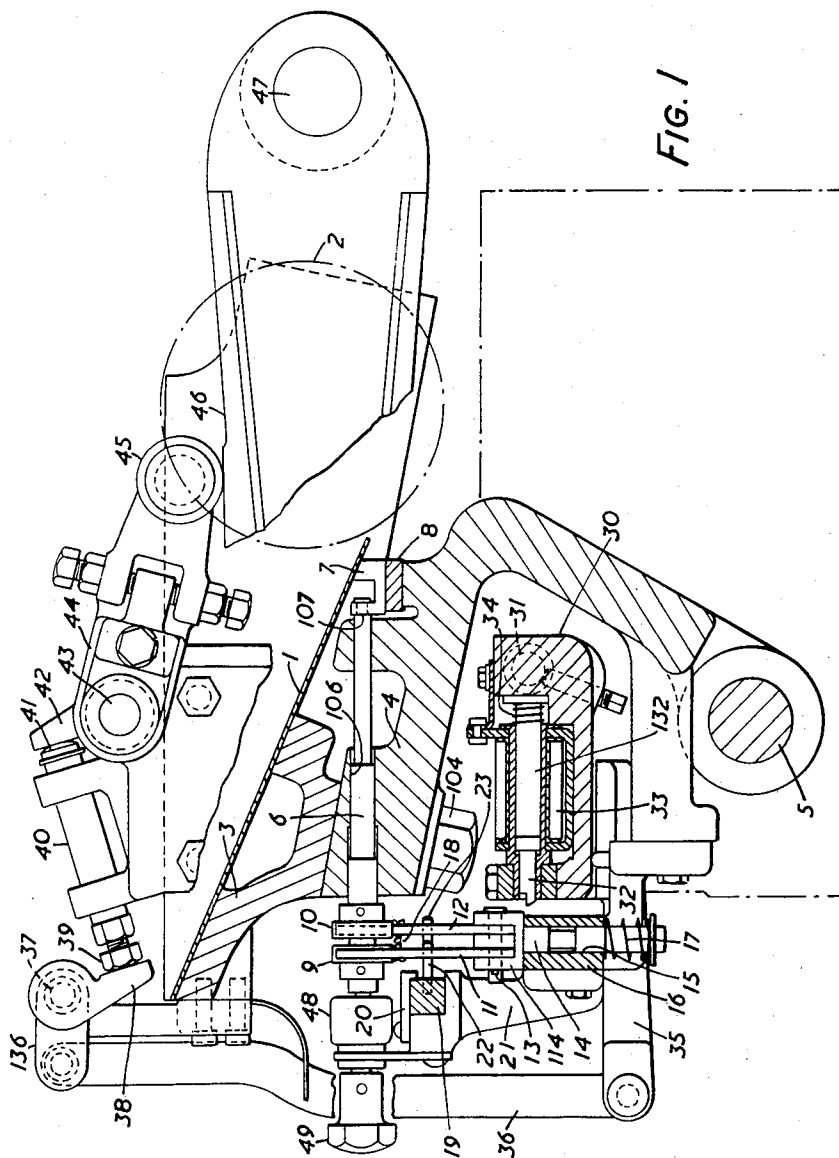
K. JAMESON

3,057,294

INKING SYSTEMS FOR PRINTING MACHINES

Filed Sept. 8, 1960

2 Sheets-Sheet 1



INVENTOR

Keith Jameson
BY

Morrison, Kennedy & Campbell
ATTORNEYS

Oct. 9, 1962

K. JAMESON

3,057,294

INKING SYSTEMS FOR PRINTING MACHINES

Filed Sept. 8, 1960

2 Sheets-Sheet 2

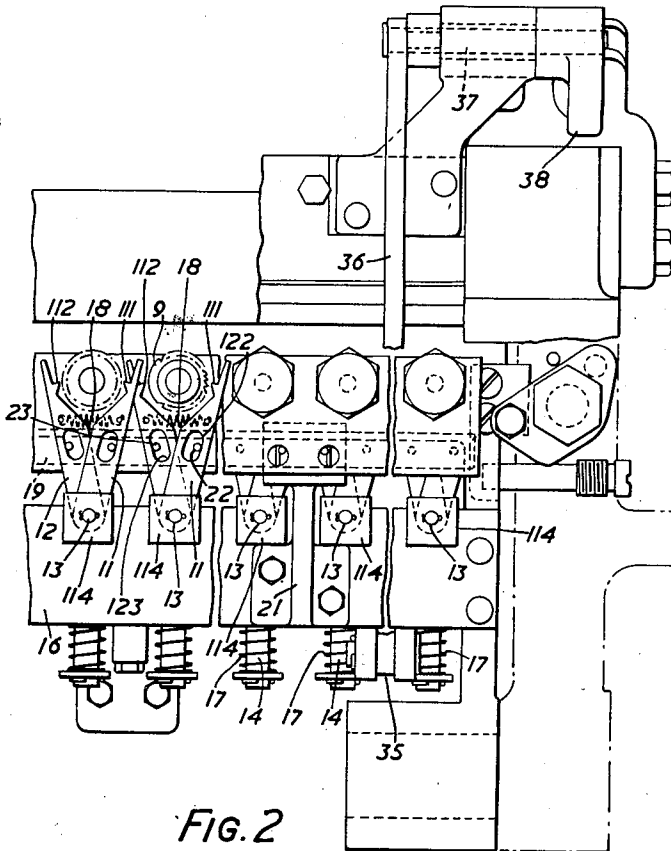


FIG. 2

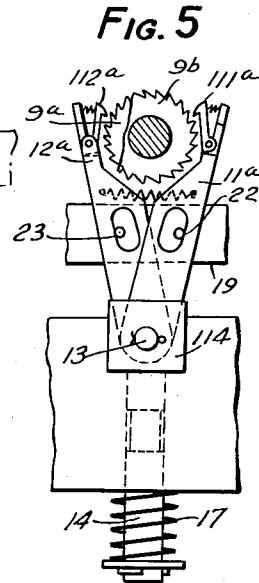


FIG. 5

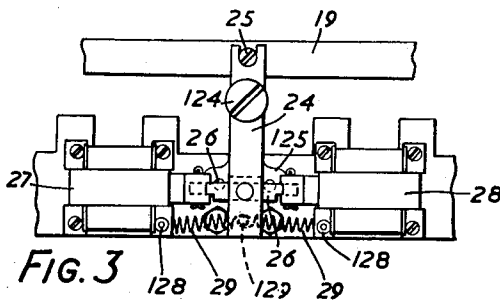


FIG. 3

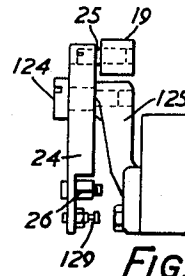


FIG. 4

INVENTOR

Keith Jameson
BY

Morrison, Kennedy & Campbell
ATTORNEYS

1

2

3,057,294

INKING SYSTEMS FOR PRINTING MACHINES
Keith Jameson, Sale, England, assignor to Linotype and Machinery Limited, London, England, a British company

Filed Sept. 8, 1960, Ser. No. 54,634

Claims priority, application Great Britain Sept. 9, 1959
13 Claims. (Cl. 101—365)

This invention relates to the control of inking systems for printing presses.

An object of the invention is to provide a remote control mechanism for varying the feed of ink from a fountain to an ink roller by adjusting the gap between the roller and the free edge of a blade at the base of the fountain.

According to the present invention there is provided control mechanism for varying the feed of ink from an ink fountain to an ink roller comprising a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink fountain roller, means associated with each screw and actuated selectively to advance or retract the screw, which means are operated selectively from a common driving means.

Also, according to the present invention, control mechanism for varying the feed of ink from an ink fountain to an ink roller comprising: in combination, a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink fountain roller, a plurality of screw control means associated one with each screw for rotation of the screw selectively to advance or retract the screw, second means controlling screw control means for selecting the direction of drive to be imparted to the screws, and means imparting motion to selected screw control means to effect adjustment to the screw associated therewith.

Also, according to the present invention, control mechanism for varying the feed of ink from an ink fountain to an ink roller comprises, in combination, a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink fountain roller, a ratchet and pawl device associated with each screw for rotation of the screw selectively to advance or retract the screw, means controlling the ratchet and pawl devices for selecting the direction of drive to be imparted to the screws and means imparting reciprocatory motion to a selected pawl (or pawls) to effect rotation of the ratchet wheel and screw associated therewith.

Likewise, according to the present invention, the control mechanism for varying the feed of ink from an ink fountain to an ink roller comprises, in combination: a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink fountain roller, a ratchet-and-pawl device associated with each screw for rotation of the screw selectively to advance or retract the screw, a transverse series of latches, of which one latch is associated with each ratchet and pawl device, and means for selectively moving each latch to an operative position for the transmission of reciprocatory motion to the associated ratchet and pawl device to effect adjustment of the screws.

In the preferred construction, the latches are mounted in a common carrier which is pivotally mounted and has imparted thereto a continuous rocking movement to produce oscillation of the series of latches as a whole. The individual latches may be moved in the inoperational position by solenoids.

The ratchet device associated with each screw may

conveniently consist of a pair of ratchet wheels fixed on the screw for turning it in opposite directions; there is a pawl on a lever for each of the two ratchets, the pawls being disposed at opposite sides of the screw and the levers being pivotally connected to a common support mounted for up-and-down movement by the associated latch; and a control is provided for selective engagement of one or other pawl with its ratchet according to the direction in which it is desired to turn the screw. The control may consist of a cross bar coupled to the pairs of pawl levers and mounted for endwise adjustment to bring all the corresponding levers in the pairs of levers into operative position for turning all the screws in the same direction.

A potentiometer may be coupled to each screw and placed in circuit with an ammeter for indicating the extent of adjustment imparted to the screw.

In the accompanying drawings, which show one example of inking system control according to the invention:

FIGURE 1 is a side elevation, partly in section,

FIGURE 2 is a front elevation, a portion of a front plate having been removed to show details of the screw operating mechanism,

FIGURE 3 is a front elevational detail of the mechanism effecting lateral movements of a slide, and,

FIGURE 4 is a side elevational detail of some of the parts shown in FIGURE 3.

FIG. 5 is a side elevation of a modified form of ratchet and pawl device.

In the drawings the invention is shown applied to a well-known form of ink fountain used for flat-bed printing machines, in which the bottom of the ink fountain box is afforded by a sloping flexible steel ink blade 1 whose lower edge is positioned close to the periphery of an ink fountain roller 2, shown in broken lines, at a position a little below the level of the roller axis. The upper portion of the ink blade is secured to a frame 3, and this frame is secured, as by studs 104, to the upper portion of an inner frame 4 which is mounted at its lower end on a rod 5 which extends transversely of the printing press. By this arrangement the inner frame 4 with its ink blade 1 can be swung downwardly on the rod 5 clear of the fountain box for cleaning purposes in a well-known manner.

A transverse series of screws 6 extends horizontally through tapped holes 106 in the inner frame 4 under the ink blade 1. The inner end 107 of each screw carries a block 7 riding on a narrow bed plate 8 extending across the frame 4. The attachment of the blocks 7 to the screws 6 is such that the screws may rotate freely relatively to the blocks 7, but will move axially with the screws. The blocks 7 engage under the ink plate 1 near its free edge adjacent to the fountain roller. By turning a given screw, its associated block is slid backwards or forwards in order to flex the free edge of the ink blade adjacent the block relatively to the periphery of the fountain roller, and thereby adjust the gap between the blade and the roller to control the feed of ink.

In place of the blocks 7 and bed plate 8 just described, each screw may simply be provided with a conical end piece.

Each screw has pinned thereto two ratchet wheels 9, 10, the teeth of which are disposed in opposite directions, one ratchet wheel 9 serving to turn the screw in one direction and the other ratchet wheel 10 serving to turn the screw in the other direction. Levers 11, 12 are each provided respectively with a pawl 111, 112, which pawls can selectively engage the ratchet wheel 9, 10 respectively.

The two levers 11, 12 for each screw are disposed V-fashion at opposite sides of the screw. The two levers are pivoted at their lower ends on a common pin 13 in

3

a fork 114 having a shank 14 extending through a vertical guide hole 15 in a fixed cross bar 16 extending across the back of the inner frame 4 of the fountain. Each fork 114 is urged resiliently downwardly by a coil compression spring 17 on the lower projecting end of the fork shank 14. A coil compression spring 18 connects each pair of pawl levers 11, 12 urging the pawl levers towards each other.

A cross slide 19 of square section extends laterally in guides 20 on brackets 21 across the front of the fountain adjacent to the levers 11, 12. This cross slide 19 has projecting rearwardly therefrom pairs of pins 22, 23, one pair of pins being associated with each pair of pawl levers 11, 12. One pin 22 of each pair extends through a slot 122 in one lever 11, and the other pin 23 extends through a slot 123 in the other lever 12. In the neutral position of the cross slide 19, the positioning of the pairs of pins 22, 23 is such that both levers 11, 12 are held by the pins against the action of the spring 18 with the pawls 111, 112 clear of the ratchets. When the slide 19 is pushed in one or other direction away from the neutral position, the resulting movement of the pairs of pins causes all the pawls on one and the same sides of the screws to engage their associated ratchets.

Movement of the slide 19 is preferably electrically controlled. In the arrangement shown, FIGURES 3 and 4, a double-armed rocker lever 24, is pivotally mounted on a pin 124, carried in a bracket 125 secured to a portion of the inner frame. The lever 24 has a slotted upper end engaging a pin 25 on the cross slide 19, and the lower arm has lateral extensions 26 coupled to opposed solenoids 27, 28. Coil tension springs 29 each secured at one end to a pin 129 on the lever 24 maintain the lever resiliently in a neutral position. The other ends of the springs are secured to screws 128. It will be seen that when the circuit to one or other solenoid 27, 28 is closed by a control switch the lever 24 is rocked in one or other direction about the pin 124 to shift the cross slide 19 and thereby move one set of pawl levers to their operative position. The solenoids 27, 28 and the springs 29 have been omitted from FIGURE 4.

The movement imparted by the cross slide is such that, for example, the pins 23 will move to the left, FIGURE 2. This will move the levers 12 counterclockwise about the pins 13. At the same time the pins 22 will attempt to make a movement relative to the slots 122, that is, the pins 22 attempt to cross the slots having the levers 11 motionless, but the springs 18 resiliently urge the levers 11 counterclockwise, FIGURE 2, so that the pawls 111 engage the ratchet wheels 9. The resilient action of the springs is such that damage will not occur to the teeth of the ratchet wheel or the pawl in the event of the pawl striking a ratchet wheel tooth instead of entering between the teeth.

Within the inner frame behind the cross bar 16 there is fitted a carrier 30 pivotally mounted at its rear end for rocking movement about a cross shaft 31. The carrier is fitted with a series of horizontal sliding latches 32, there being as many latches as there are screws, and each latch extends forwardly adjacent to a fork 114. Each latch 32 is secured to the armature 132 of a solenoid 33 and is projected forwardly into the operative position by the energisation of the solenoid. The solenoids 33 are fitted within the carrier 30. A coil spring 34 normally holds each solenoid armature and hence each latch in a retracted position.

During the operation of the printing machine, the carrier 30 is continuously rocked in timed sequence to raise and lower the series of latches 32 behind the forks 114 carrying the pawl levers. For this purpose the carrier has a horizontal arm 35 coupled by a vertical link 36 to an arm 136 on a rocker shaft 37. An abutment lug 38, pinned to the shaft 37 is engaged by one end 39 of a thrust rod 40 whose other end 41 is engaged by an abutment 42 pinned to a shaft 43. A rocker

4

arm 44 is pinned to the shaft 43, the arm 44 carrying a roller 45 riding on a cam arm 46 which is oscillated from the shaft 47, controlling the movements of the ductor roller, not shown.

Each screw is fitted in front of the ratchets with a rotary potentiometer 48 in circuit with an ammeter not shown. The ammeter affords an indicator to show the rotation imparted to the screw to which the slider of the potentiometer is secured, and thereby the degree of adjustment made to the ink blade. A hand knob 49 is secured to the outer end of each screw to permit manual adjustment of the screws.

During the operation of the mechanism, the rocker arm 44 produces reciprocation on the thrust link rod 40, oscillation of the vertical link 36, and up-and-down movement of the latch carrier 30. When it is desired to adjust the ink gap at any given point or points, or along the whole of the ink blade, a switch not shown is operated to shift the cross slide 19 in one or other direction according to whether it is desired to advance or retard one or more screws. If the adjustment calls for operation of, say, three screws, the three switches, not shown, for the latch solenoids associated with these screws are then closed. As a result, the three latches are projected forwards. When the latch carrier is in its lower position during oscillation, the three latches engage under the three adjacent forks. As the carrier rises, these three latches lift the forks; and the three pawl levers rotate the ratchets and thereby the three screws. There is thus a stepwise movement of the pawls during each stroke of the latch carrier. At the end of their travel in either direction, the screws are automatically stopped by the circuit to the latch solenoids being opened by the potentiometer, whereupon the latches are retracted by their springs 34 to an inoperative position in their carrier.

In a modification of the pawl and ratchet mechanism, shown in FIG. 5, the inclination of the teeth of the ratchet wheels 9a and 9b is opposite that shown in FIGURE 2 and the pawls 111a and 112a are pivotally mounted on the levers 11a and 12a, the pawls being spring loaded, within limits, towards the ratchet wheels. The arrangement is such that when any given pair of levers is raised by its associated latch, the levers rise up as hereinafore described, but the pawl of the operative lever rides over the ratchet wheel teeth during the lifting travel of the lever, and then clicks into a tooth gap as the lever completes its travel. The latch 32 then rocks downwardly and the lever is drawn downwardly by the action of the associated spring 17. Thus the screws are turned in such a way that in the event of their becoming jammed for any reason the force applied to any given one of them will be applied by its spring 17 and not a direct force applied by the rising latch.

I claim:

1. Control mechanism for varying the feed of ink from an ink fountain to an ink roller comprising in combination: a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink fountain roller, a pair of oppositely facing ratchet wheels secured to each adjusting screw for turning the screw in opposite directions to advance or retract the screw, a pair of actuating pawls associated with each pair of ratchet wheels, a reciprocatory support in which both pawls of each pair are pivotally mounted, means for engaging the screw advancing pawls of all the different pairs with their corresponding ratchet wheels and for maintaining the screw retracting pawls of all the different pairs out of engagement with their corresponding ratchet wheels, or vice versa, a power operated driving member common to all of the pawl carrying supports, a series of transverse latches, one for each pawl carrying support, for transmitting the motion of the driving member in one direction to the pawl carrying supports, and means for adjusting the motion transmitting latches selec-

5

tively to operative or inoperative position on the driving member, whereby any selected screw or screws may be actuated in either direction to advance or retract said screw or screws.

2. Control mechanism according to claim 1, wherein the pawl engaging and disengaging means comprise a common cross slide carrying pins which project through slots formed in both pawls of each pair.

3. Control mechanism according to claim 1 wherein the power operated driving member is pivotally mounted and has imparted thereto a continuous rocking movement to produce oscillation of the series of latches as a whole.

4. Control mechanism according to claim 1 wherein the pawls of each pair extend from a common pivotal point in the corresponding support to either side of the two ratchet wheels.

5. Control mechanism according to claim 2 wherein each pair of pawls is resiliently urged towards each other, but are restrained by the pins projecting from the common cross slide each pin passing through a slot in the pawl.

6. Control mechanism according to claim 1 wherein each reciprocatory support has associated therewith resilient means urging it to a seating position.

7. Control mechanism according to claim 1, wherein the adjusting means for each latch includes a spring urging it to an inoperative position.

8. Control mechanism according to claim 1 wherein each pawl is pivotally mounted on an associated operating lever pivoted in the reciprocatory support, and is resiliently urged, within limits towards its associated ratchet wheel, whereby the pawl will ride over the ratchet teeth in one direction of travel of the levers and engage the teeth on the return stroke of the lever.

9. Control mechanism according to claim 8 wherein each reciprocatory support is provided with means resiliently urging the levers in a direction opposite to that imparted by the latches, the resilient means effecting the rotation of a given screw when a pawl has engaged between the teeth of the ratchet wheel associated therewith.

10. Control mechanism according to claim 1 wherein each latch is operated by a solenoid.

11. Control mechanism according to claim 3 wherein the power operated driving member is oscillated through linkage actuated by the inking roller mechanism of the printing press.

12. Control mechanism for varying the feed of ink from an ink fountain to an ink roller comprising in combination: a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink foun-

6

tain roller, a pair of oppositely facing ratchet wheels secured to each adjusting screw for turning the screw in opposite directions to advance or retract the screw, a pair of actuating pawls associated with each pair of ratchet wheels, a reciprocatory support in which both pawls of each pair are pivotally mounted, means for engaging the screw advancing pawls of all the different pairs with their corresponding ratchet wheels and for maintaining the screw retracting pawls of all the different pairs out of engagement with their corresponding ratchet wheels, or vice versa, means for selecting for reciprocation one or another of the individual pawl carrying supports to the exclusion of the remaining supports, and power means for effecting the reciprocation of the selected pawl carrying supports, whereby any selected screw or screws may be actuated in either direction to advance or retract said screw or screws.

13. Control mechanism for varying the feed of ink from an ink fountain to an ink roller comprising in combination: a plurality of adjusting screws positioned transversely of the ink fountain for axial adjustment to flex the free edge of the ink blade relatively to the ink fountain roller, a pair of oppositely facing ratchet wheels secured to each of the adjusting screws for turning the screw in opposite directions to advance or retract the screw, a pair of pawl carrying levers associated with each pair of ratchet wheels and extending from a common pivotal point to opposite sides of the associated screw, a reciprocatory support in which the pawl carrying levers of each pair are mounted, a spring urging the support to a seating position, resilient means urging the pawl levers toward each other, a common cross slide connected by pin and slots to the pawl carrying levers and normally holding their pawls out of engagement with the ratchet wheels, means for adjusting the cross slide in one direction or the other to locate the pawls on one side or the other of the screws in engagement with their corresponding ratchet wheels, a common carrier mounted for continuous oscillation in the operation of the press, a series of latches mounted in said carrier, one for each of the reciprocatory supports for the pawl carrying levers, and means for adjusting the latches selectively into and out of engaging relation to their corresponding supports.

References Cited in the file of this patent

UNITED STATES PATENTS

1,275,642	Bechman	Aug. 13, 1918
2,392,706	Taylor et al.	Jan. 8, 1946
2,902,927	Ross	Sept. 8, 1959

FOREIGN PATENTS

834,183	Great Britain	May 4, 1960
---------	---------------	-------------