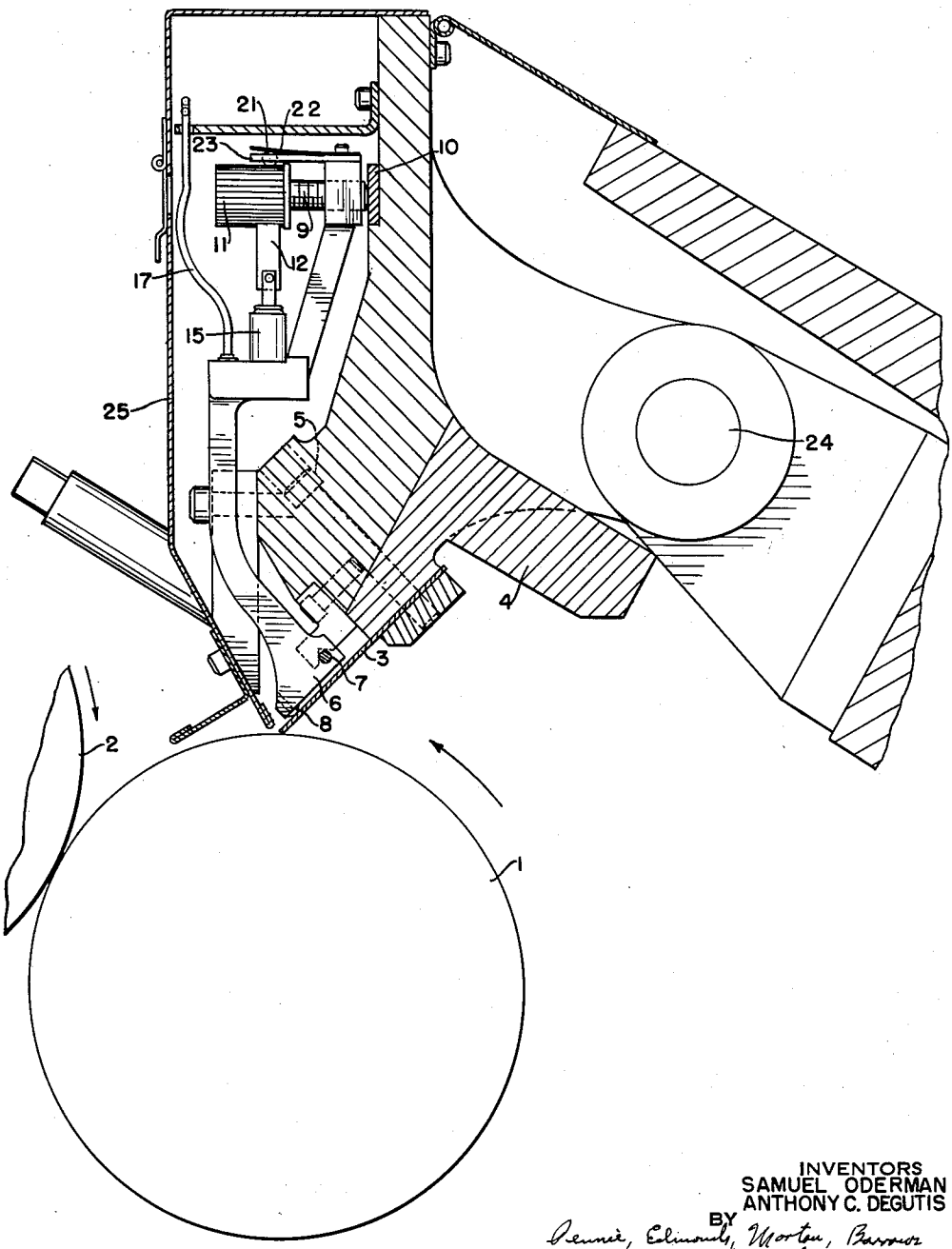
Jan. 14, 1964 S. ODERMAN ETAL 3,117,516

INK CONTROL DEVICE FOR FOUNTAIN ROLL

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FIG. 1



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FIG. 2

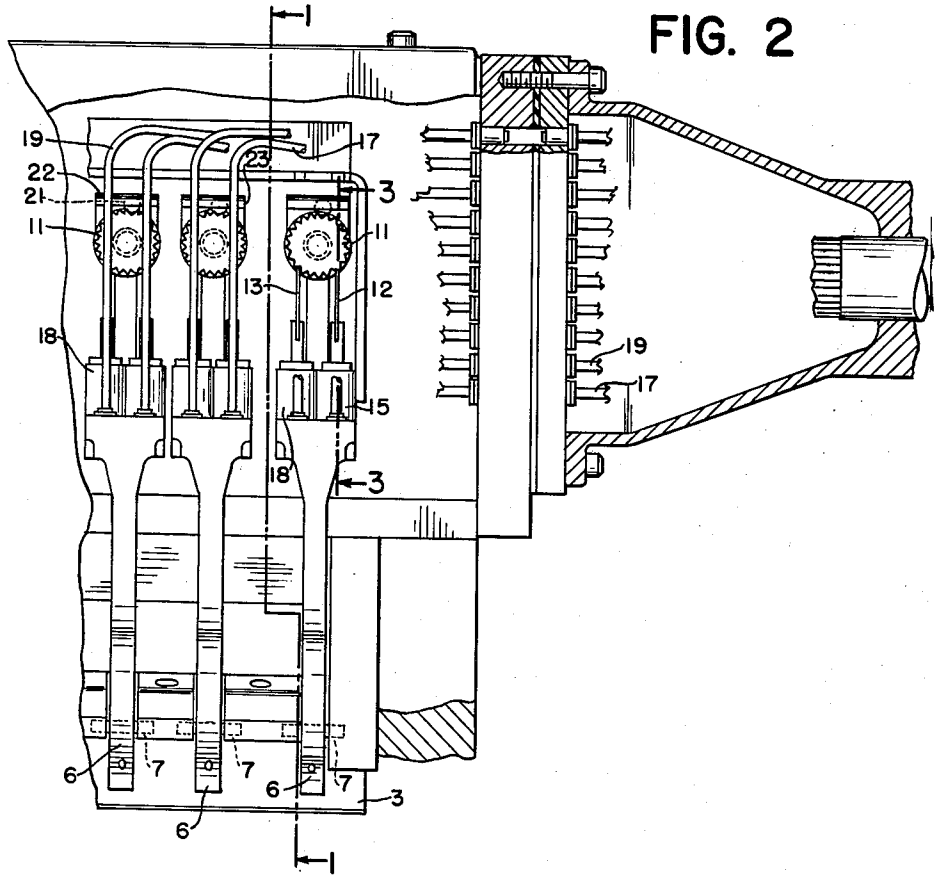
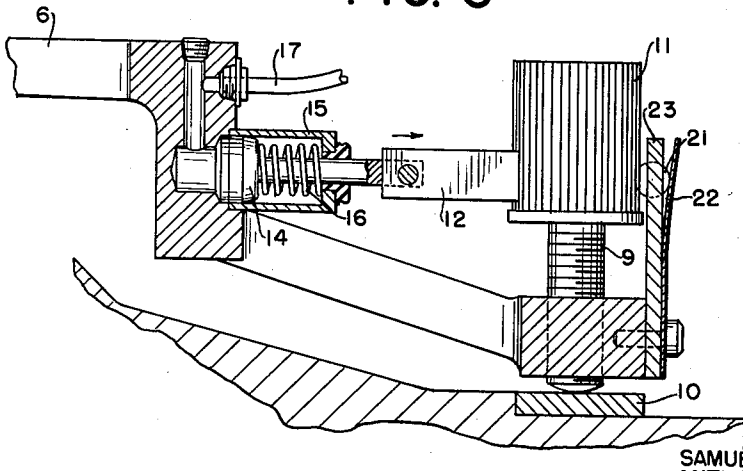


FIG. 3



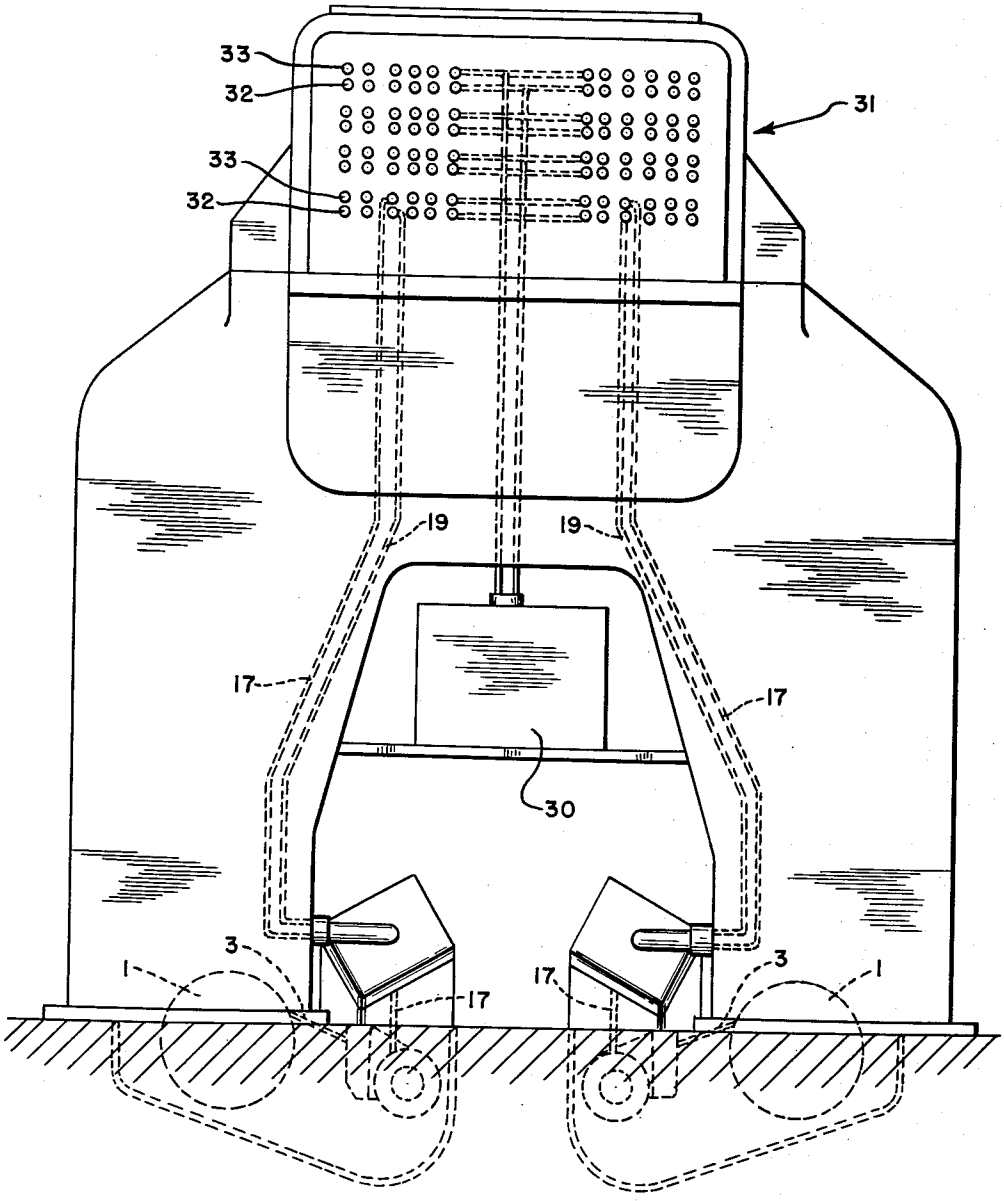
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FIG. 4



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INK CONTROL DEVICE FOR FOUNTAIN ROLL

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This invention relates generally to an ink control device for removing excess ink from a fountain roll and more particularly to a device which may be easily and accurately adjusted along the length of the roll to vary the amount of ink removed therefrom.

The width of modern presses is such to include, as in the case of newspaper presses, a number of pages wherein each page may contain on the order to eight or more individual columns. It is often necessary to vary the amount of ink to be applied to the individual printing plates of the press since some of the pages and columns may contain more print, and thus require more ink, than others. It is known that the amount of ink to be applied to the printing plates may be regulated by varying the removal of excess ink from a fountain roll which is partially submerged in a bath of ink. The amount of ink removed from the fountain roll is in turn regulated by a flexible blade which runs the length of the roll and which may be flexed to vary its lateral distance from the roll and so scrape excess ink therefrom. Heretofore, the blade was flexed by a series of screw means which extended parallel to the blades, usually there being one screw means for each column. The screw means consisted of a single screw having one end bearing on the blade so that when the screw was rotated, the blade would be bent either towards or away from the fountain roll.

The precise adjustment of the blade with respect to the fountain roll was determined by a trial and error process whereby individual screws would be rotated to flex the blade until the proper amount of ink remained on the fountain roll which could be determined only by experience or by an actual press run. This trial and error process of adjusting the blade took an appreciable length of time and prevented quick changes of printing plates in the press because the amount of ink to be applied to the individual plates and columns might vary. Further, in using this apparatus for controlling ink to be applied to the fountain roll, no means were provided for limiting the flexure of the blade during a press set up. That is to say, that the press operator might at one time make a one-half turn of a particular screw to vary the distance of the blade from the roll, while at another time another operator might make only a one-quarter turn of the screw even though both were seeking the same setting of the blade with respect to the roll. If motor means were used to effectuate the adjustment, the operator would have to determine exactly the period of time for operating the motor since this would in turn determine the amount of rotation of the screw and thus flexure of the blade. Since regulation of the blade must be on the order of three thousandths of an inch, it became an extremely difficult process to set the blade accurately with respect to the roll and sometimes, if the motor rotating the screw were operated overly long, the block itself could be brought into direct contact with the roll and then damage it.

Broadly, we propose to overcome the aforementioned difficulty of adjusting the blade with respect to the fountain roll by providing for an adjustment means which will adjust the flexure of the blade by means of a series of individual actuation means which in turn are provided with limit means wherein the blade can be flexed only a predetermined amount upon each actuation of the individual actuation means.

The adjustment means comprises a series of pivoted levers, one for each column, extending parallel to the fountain roll. Thus, in a press capable of printing 4 pages of newspaper at one time and having 8 columns per page, we have 32 pivoted levers. Each lever is so arranged that one end bears on the flexible blade while the other end has extending through it a screw having one end bearing on a stop. The screw in turn has mounted thereon a ratchet wheel which is adapted to be engaged by two pawl-like projections each connected to a pneumatic piston which is enclosed in a pneumatic cylinder. Upon admission of pressurized air to the pneumatic cylinder the piston is caused to move and so turn the toothed ratchet wheel a distance of one tooth width. A spring inside the cylinder returns the piston when pressure is exhausted therefrom to a position where it may again be moved to rotate the screw a distance equal to one tooth width. Thus by successive movements of the piston, the blade may be flexed a predetermined amount, the direction depending on which of the two pneumatic pistons associated with a single lever is actuated.

Referring to the drawings in which a preferred embodiment of our invention is illustrated,

FIG. 1 is a partial side-sectional view of our ink control device shown associated with a fountain roll;

FIG. 2 is a partial sectional top plan view of FIG. 1;

FIG. 3 is an enlarged sectional view of FIG. 2 taken along lines 3—3; and,

FIG. 4 is an end view of a press unit illustrating the location of operator control means for regulating the amount of ink on the fountain roll.

Referring to the drawings in greater detail and in which like parts have the same identifying numeral, 1 is a fountain roll which is partially submerged in an ink bath not shown, which in turn is contacted by a second roll 2 which conveys ink to the plates of the printing press, or to other spreading rolls. Excess ink is scraped off the roll 1 by means of a flexible blade 3 which is attached on one end to a carrier 4 by means of bolts 5. Blade 3 extends the full length of roll 1 and is parallel to the longitudinal axis of the roll. Blade 3 may be flexed laterally of roll 1 by a series of levers 6 which pivot about pins 7 which in turn are secured to carrier 4. Levers 6 are spaced as shown in FIG. 2 so that there is one lever for each column width of the press. Pin 8 which is carried in the end of each lever 6 bears upon blade 3 and may for all intents and purposes be considered an integral part of lever 6.

Each end of lever 6 opposite from 8 has therein a screw 9 which bears upon a stop 10 of the carrier. Screw 9 has at one end a toothed ratchet wheel 11 which, as shown in FIGS. 2 and 3, is adapted to be engaged by pawl-like projections 12 and 13. Pawl-like projection 12 in turn is connected to pneumatic piston 14 as shown in FIG. 3. It is to be understood that projection 13 is likewise connectetd to a pneumatic cylinder similar in all respects to piston 14. Piston 14 is movable within pneumatic cylinder 15 against the bias of a spring 16 under the influence of pressure coming from a source of pneumatic pressure through conduit 17. It is thus seen that when air is admitted to cylinder 15, it will cause piston 14 to move to the right as shown in FIG. 3 and rotate the ratchet wheel 11 in a counterclockwise direction as shown in FIG. 2, a distance of one tooth width. This in turn will rotate screw 9 the same distance and so cause lever 3 to rotate a predetermined amount about pivot 7, the amount of rotation being determined by the pitch of the threads of screw 9 and by the length of the teeth of the ratchet wheel 11. This in turn will cause blade 3 to move towards roll 1 a predetermined distance.

Pawl-like projection 13 and the mechanism for moving it are the same as that shown in FIG. 3 but for simplicity,

the details have not been included in the drawings. The cylinder 18 which is associated with projection 13, is connected to a source of pressure by means of a conduit 19 in the same manner as the cylinder 15 and upon admission of pressure thereto, will move projection 13 to rotate the ratchet and screw in a clockwise direction to allow the blade to flex away from the roll.

Conduits 17 and 19 may extend to any desired position such as a control panel 31 positioned on the side of a press unit as shown in FIG. 4. The panel has thereon a plurality of pushbutton valves 32 interposed between the source of pressure 30 and the conduit 17 and a plurality of pushbutton valves 33 interposed between the source of pressure and the conduits 19. Upon each actuation of one of the pushbutton valves, the conduit containing the valve is connected to the source of pressure whereby air will be admitted to the pneumatic cylinder contained to the conduit to move the ratchet. Preferably, it is desirable to have separate pushbutton operated valves 32 and 33 for each column of the page being printed.

The amount of movement of the doctor blade with respect to the fountain roll is of extremely small order, usually of the magnitued of $\frac{3}{1000}$ of an inch or less. It is seen that the amount of flexure of the blade with each movement of the pneumatic pistons may be regulated either by changing the pivot points 7 with respect to the lever or by changing the pitch of the threads of the screw 9. It is further seen that each actuation of the pneumatic piston will flex the blade a predetermined distance so that no matter how long pnenumatic pressure is applied to the cylinder 15, or how long the operator depresses the valve (not shown) controlling admission of pressure to conduits 17 and 19, the blade will only be moved the predetermined amount.

A detent comprising a ball 21 and a spring 22 serves to lock ratchet wheel 11 and thus screw 9 against any inadvertent rotation except when the ratchet 11 is engaged by projections 12 and 13. Ball 21 is kept in place by means of a plate 23 having therein an aperture through which the ball passes.

The carrier 4 upon which the blade and adjustment means are mounted is adapted to pivot about point 24 so that the complete blade and adjustment assembly may be turned away from the fountain roll for cleaning and repairing. The carrier 4 further has thereon a housing member 25 which serves to keep the apparatus free from grit and dirt.

Having described our invention, what we claim and desire to secure by Letters Patent is:

1. An ink control device for a fountain roll comprising a flexible blade extending parallel to the longitudinal axis of said roll for removing excess ink therefrom; a series of pivotable levers extending parallel to said blade for flexing said blade laterally, one end of each of said levers being rounded and engaging said blade; a screw rotatably threaded in the end of each said lever opposite the rounded end; a stop against which an end of said screw bears; a toothed ratchet wheel mounted on the other end of each said screw from said end bearing on said stop; two pneumatic cylinders associated with each said lever; a source of pneumatic pressure connected to each of said cylinders; operator control means for selectively admitting pneumatic pressure from said source to either of said two pneumatic cylinders associated with a lever; a piston movable in each said cylinder in response to said pneumatic pressure; a pawl-like projection on an end of each said piston engaging a tooth on said toothed ratchet wheel, said pawl-like projection and said toothed ratchet wheel comprising together a limit means for limiting rotation of said screw upon each admission of pneumatic pressure into a cylinder; each actuation of said operator control means causing pneumatic pressure to be admitted to a cylinder to rotate a screw which in turn pivots a lever so as to flex said blade a predetermined amount.

2. An ink control device according to claim 1 wherein each said pivotable lever is pivoted about a point substantially closer to said blade than to said stop.

3. An ink control device according to claim 1 wherein said blade continuously and forceably bears against each said rounded end and having in addition detent means associated with each said ratchet wheel in order to prevent inadvertent rotation of said screws; the force of said blade bearing upon each said rounded end eliminating lost motion in the device.

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