April 9, 1929. M. SCHLÖTTER 1,707,995

INKING MECHANISM FOR PRINTING PRESSES AND THE LIKE

Filed Sept. 20, 1926

Fig. 3.

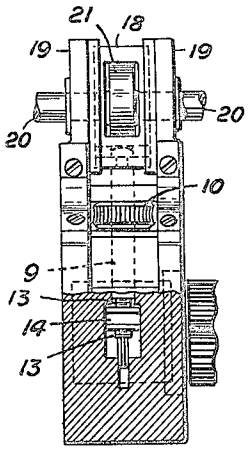



Fig. 1.

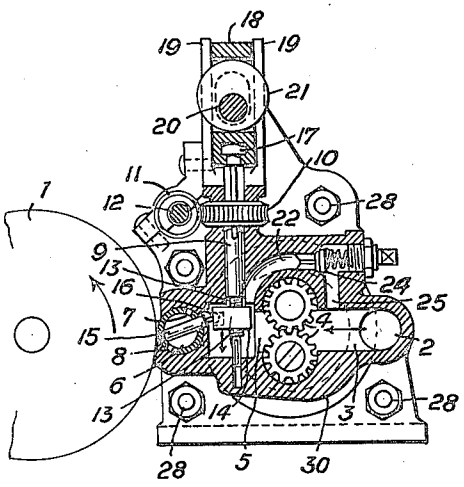



Fig. 2.

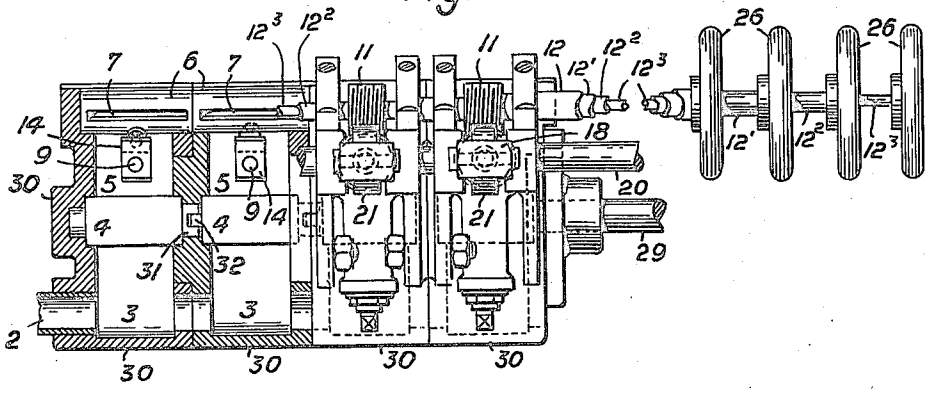
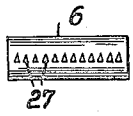



Fig. 4.



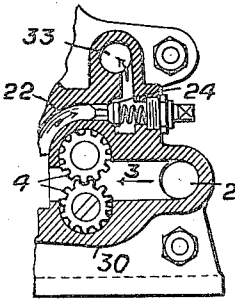




Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## INKING MECHANISM FOR PRINTING PRESSES AND THE LIKE.

Application filed September 20, 1926, Serial No. 136,567, and in Germany September 24, 1925.

The present invention relates to inking mechanisms for printing presses and a principal object of the invention is to provide an inking mechanism, which will allow a uniform and economical feeding of the ink to the ductor or the like to be inked. Another object is to provide ink supply regulating means which are easy to operate and which will make it possible to control with great accuracy the amount of ink supplied to the ductor. Still other objects will appear in the following description and appended claims.

The hitherto known inking mechanisms for printing presses are rather deficient, in that they are difficult to control and that a relatively great amount of ink is lost when the press is at rest and by the ink container getting dusty.

The drawbacks adhering to the known ink feeding devices are eliminated in the mechanism according to the present invention in which the feeding may be controlled very accurately and in which all losses are prevented which hitherto occurred when the press was at rest or by some elements of the mechanism getting dusty. The invention also makes it possible to print several columns simultaneously, each in a different color.

The invention is shown by way of examples in the drawings, in which:

Figure 1 is a vertical cross-section through a preferred form of the invention.

Figure 2 is a plan view partly in section of the mechanism.

Figure 3 is a front view partly in section.

Figure 4 is a detail showing the outlet element of the apparatus.

Figure 5 is a sectional view showing an element of somewhat modified construction.

1 is the inking cylinder or ductor of a power printing machine. The ink is supplied from an ink container (not shown) through a conduit 2 and flows through a communication channel 3 to a feeder consisting of two intermeshing toothed wheels 4, which are rotating in the direction indicated by arrows in Fig. 1. This feeding or filling device feeds the ink into a pressure chamber 5 in the front of which a hollow cock plug 6 is fitted in a cylindrical horizontal bore. In the position shown in Fig. 1 no ink can escape, because the inlet opening 7 and the outlet opening 8 of the cock are closed. The cock is turned by a vertical spindle 9, which is operated from the shaft 12 by means of a worm-wheel 10 and a worm 11. When the spindle is rotated a nut 14 on a threaded part 13 of the same is moved upward or downward. Said nut 14 is guided in the frame of the apparatus. A pin 15 is fixed in the cock and the ball-shaped head 16 of the pin engages a lateral groove in the nut 14. The head 16 partakes in the upward and downward movement of the nut and thereby the cock is turned correspondingly. If the nut 14 for instance takes up the raised position shown in Fig. 1 the cock is in closing position. If the nut however is situated near its lowermost position the inlet opening 7 corresponds with the pressure chamber 5 and the opening 8 is more or less open.

The toothed wheel feeder should not be regarded as an ink pump. In up to date printing machines the ink is supplied from a central tank or the like by means of artificial pressure or by arranging the ink container in a raised position. The object of the feeder 4, 4 is mainly to predose the ink coming from the container and to prevent the too high pressure of the container from acting directly upon the outlet elements of the mechanism. The fine-dosing of the ink is effected by means of the cocks. In this way the ink-delivering takes place in two stages. Further the feeding device 4, 4 maintains a constant pressure in the pressure chamber 5, which is of great importance for obtaining prints of good quality.

The feeding device 4, 4 rotates continually, also when the machine is at rest. In order to prevent ink leaking out of the machine, when the same is not operating the following measures are taken.

The upper end of the spindle 9 is fastened in a slide 18, which is movable in perpendicular direction and is guided in the supports 19 of the frame 30. The worm wheel 10 is by means of a long spline arranged axially displaceable on the spindle 9 i. e. the spindle can be raised and lowered without the engagement between the worm-wheel 10 and the worm 11 being disturbed. The slide 18 embraces an eccentric 21 on a shaft 20, in such a manner, that it is possible to lower or raise the shaft or spindle 9 by turning the eccentric 180°, whereby the ink supply passage is opened or shut off by means of the cock.

In order to remove superfluous ink, which has been forced into the chamber 5 when the press was at rest a passage 22 is arranged, which leads to a spring-actuated valve 24. The hollow space above the said valve com-

municates with the channel 3 through a passage 25. When the press is at rest the ink therefore flows back from the pressure chamber 5 to the channel 3.

If it is not desired to mix the ink fed into the pressure chamber 5 with the fresh supply of ink, the device shown in Fig. 5 may be employed, at which the ink is let off through a special drain tube 33 after having passed the valve 24.

The inlet opening 7 and the outlet opening 8 of the cock have the form of a slot of substantially the same length as the cock plug proper. The width of the slot is as before mentioned adjusted by means of the shaft 12, which is operated by means of the hand wheel 26. The rotation of the shaft 12 is by means of the worm wheel and the worm transmitted to the spindle 9, the movement of which again by means of the nut 14 is transmitted to the cock plug in the manner described above. In this way it is possible to adjust the width of the slot very accurately. A still finer adjustment may be obtained by forming the outlet of the cock as a series of triangular apertures 27, as shown in Fig. 4. In this form of the opening only point shaped holes are created at the commencement of the opening movement, which holes gradually increase in size as the cock is turned.

When printing a plurality of columns simultaneously, each column needs a different amount of ink, according as its matter is more or less densely set, wherefore in such case a separate and independently adjustable feeding apparatus is supplied for each column. In other words, a complete feeding device including cock-plug, feeder, apparatus frame etc. is provided for each column. The row of frames 30 are interconnected by means of screws 28. The driving shaft 29 for the feeders 4, 4 is not in one piece, but the lower wheels 4 have on one side a bifurcated pin 31 and on the other side a flat projection 32 which fits into the bifurcation of the adjacent lower wheel 4. A similar projection is also formed on one end of the shaft 29 and fits into the bifurcation of the adjacent lower wheel 4. By means of this coupling arrangement the shaft 29 and the lower wheels 4 are interconnected in such a manner that they will rotate as if they were forming an integral body.

The shaft 20 on which the eccentrics 21 are arranged is formed in one piece. The worms 11 are driven by the device described below.

Each cock must be furnished with separate driving means and a separate hand wheel. The driving shafts are therefore all but one formed as hollow shafts which lie coaxially ore within the other. For four cocks for instance four shafts 12, $12^1$, $12^2$ and $12^3$ are provided of which only the last named is a solid one. It will thus be understood, that it is possible to adjust each cock accurately and separately by means of its appertaining adjusting means. Each adjustment remains unchanged for the print to be produced, even when the press is to be stopped and all cocks are closed simultaneously by means of the shaft 20 and the eccentrics 21. When the work is resumed the cocks are all by means of the eccentrics brought back into exactly the same position of adjustment.

It is thus evident, that the ink supply by means of the new apparatus is effected in an economical manner, which allows an exact adjustment. It will further be evident that no ink is lost when the printing operation is stopped and that the ink-containing elements of the apparatus can not become dusty. The apparatus may be arranged for any number of columns, simply by arranging the frames in a row and coupling the same together.

If the common passages 2 and 33 are replaced by separate passages for each inking device, each device may be fed with an ink of different color. In this way it is possible to ink each column with a different color simultaneously.

I claim:

1. In an ink supplying mechanism for printing presses and the like, an ink container, a rotatable feeding device cooperating with the said ink container, means for rotating said feeding device continually, a cock-valve cooperating with the said rotating feeding device, a plug rotatably arranged in the said valve, inlet and outlet openings in the said plug, a spindle, a threaded part on said spindle, a nut-located on the said threaded part of the spindle, a groove in the said nut, a pin member fastened in the said plug and projecting into the said groove, and means for rotating the said spindle, whereby the inlet and outlet openings of the said plug may be adjusted to admit any desired amount of ink to the body to be inked.

2. In an ink supplying mechanism for printing presses and the like, an ink container, a rotatable feeding device cooperating with the said ink container, means for rotating said feeding device, a pressure chamber, said feeding device being adapted to feed ink into the said pressure chamber, a cock-valve arranged in the pressure chamber, a vertically arranged rotatable spindle, a worm wheel and worm connection for rotating said spindle, means connecting the said spindle with the said cock valve and means for raising or lowering the said spindle in axial direction.

3. A pressure chamber, said feeding device being adapted to feed ink into the said pressure chamber, a cock-valve arranged in the pressure chamber, a vertically arranged rotatable spindle, a worm wheel and worm connection for rotating said spindle, means connecting the said spindle with the said cock valve and means for raising or lowering the

said spindle in axial direction, without disturbing the connection between the said worm and the said worm wheel.

4. In an ink supplying mechanism for printing presses and the like, an ink container, a rotatable feeding device cooperating with the said ink container, means for rotating said feeding device, a cock-valve cooperating with the said rotating feeding device, a plug rotatably arranged in the said valve, inlet and outlet openings in the said plug, a spindle, a threaded part on said spindle, a nut located on the said threaded part of the spindle, a groove in the said nut, a pin member fastened in the said plug and projecting into the said groove, means for raising and lowering the said spindle in axial direction to open or shut respectively the said valve cock, to effect a coarse adjustment of the same, and other means for rotating the said spindle, in order to effect a fine adjustment of the same.

5. In an ink supplying mechanism for printing presses and the like, an ink container, a rotatable feeding device cooperating with the said ink container, means for rotating said feeding device, a cock valve cooperating with the said rotating feeding device, a plug rotatably arranged in the said valve, a slot-shaped inlet opening in the said plug, a series of triangular outlet openings in the said plug, a vertically arranged spindle, a threaded part on said spindle, a nut located on the said threaded part of the spindle, a groove in the said nut, a pin member fastened in the said plug and projecting into the said groove, an excenter for raising and lowering the said spindle in axial direction to open or shut the said valve cock, to effect a coarse adjustment of the same, and a worm wheel and worm connection for rotating the said spindle, in order to effect a fine adjustment of the same, said spindle being axially shiftable without disturbing the connection between the said worm wheel and the said worm.

6. In an ink supplying mechanism for printing presses and the like, an ink container, a pressure chamber, a rotatable feeding device cooperating with the said ink container and feeding into the said pressure chamber, a valve cock, adjustable inlet and outlet openings in the said valve cock, means for adjusting the inlet and outlet openings of the said valve cock and spring actuated means adapted to be operated by the pressure of the ink in the pressure chamber and to lead away from this chamber to the rear of the feeding device the ink which is forced into the pressure chamber when the said cock valve is closed.

7. In an ink supplying mechanism for printing several columns simultaneously, a supply unit for each column, each supply unit comprising in combination a rotatable feeding device, valve means for regulating the supply of ink furnished by the said feeding device, a device for effecting a coarse adjustment of said valve and another device for effecting a fine adjustment of said valve and operating independent of the device for effecting the coarse adjustment and a common shaft for all units for operating the said coarse adjustment device.

In testimony whereof I affix my signature.

MAX SCHLÖTTER.