B. C. WHITE.

INKING MECHANISM.

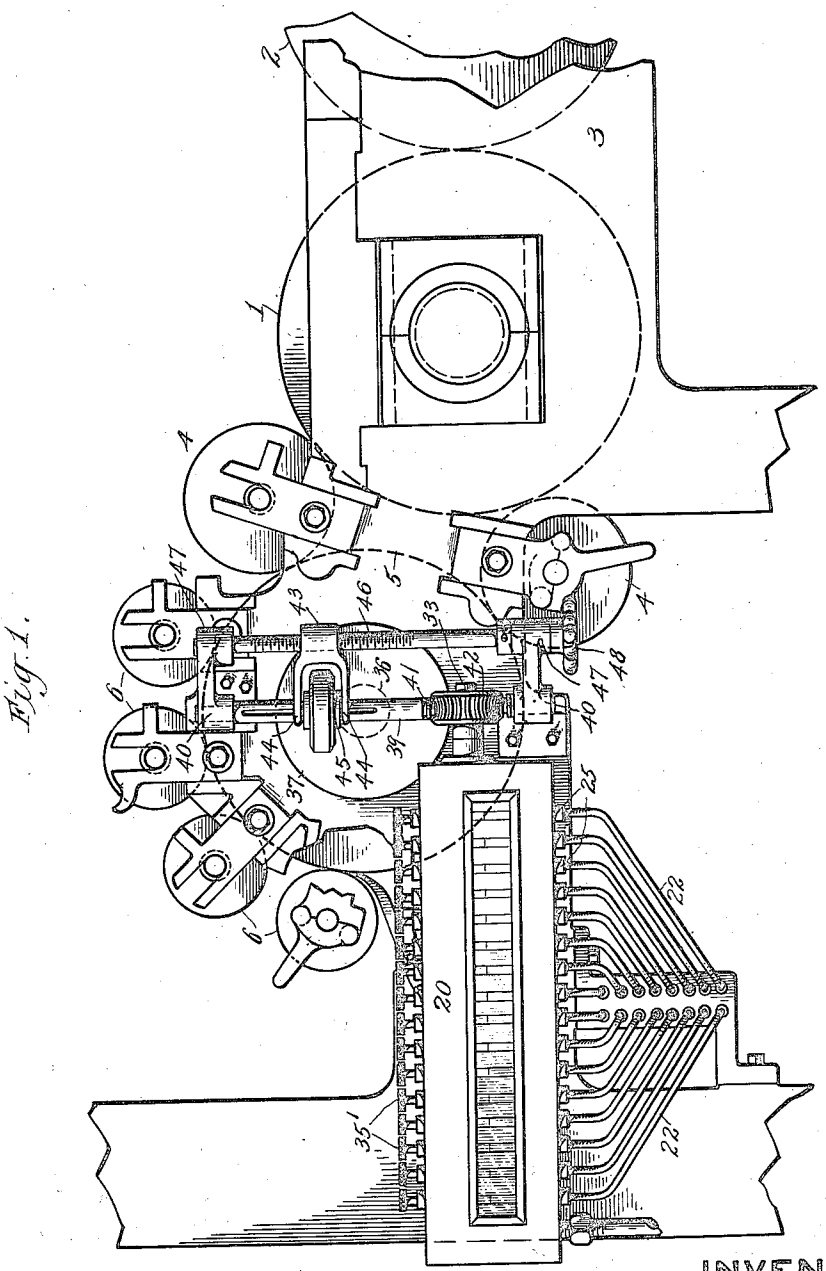
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1,214,856.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

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2 SHEETS—SHEET 2.

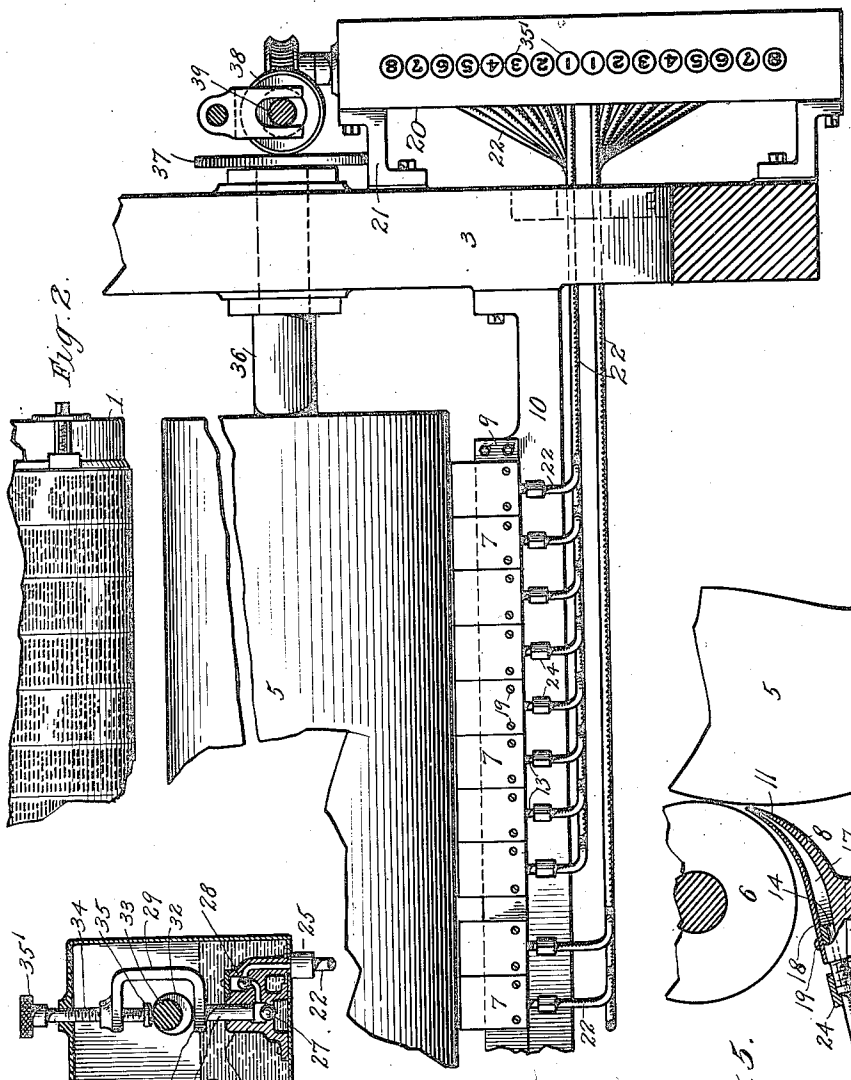


Fig. 2.

Fig. 3.

Fig. 5.

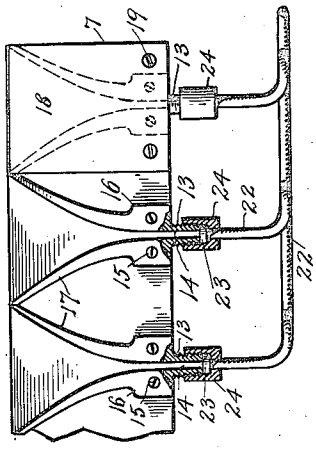


Fig. 4.

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UNITED STATES PATENT OFFICE.

BRUCE C. WHITE, OF NEW YORK, N. Y., ASSIGNOR TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

INKING MECHANISM.

1,214,856. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed October 24, 1913. Serial No. 797,003.

To all whom it may concern:

Be it known that I, BRUCE C. WHITE, a citizen of the United States, residing at New York city, county of New York, and State of New York, have invented certain new and useful Improvements in Inking Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in inking mechanism for printing machines.

It is one object of the invention to provide a construction of simple design for delivering a supply of ink to each column of the form carried by the form member of a printing couple, the inking supplying devices for each column being independent so that the supply of ink to each column may be varied in accordance with the matter in each column and thus effect an even and regular inking of the form and producing a printed page of even and regular appearance.

It is a further object of the invention to provide a construction whereby the independent ink supplying devices may have the amount of ink delivered thereto regulated or adjusted from a point outside the machine, so that the regulation or adjustment may be effected without interrupting the operation of the machine, and in which preferably the ink is fed or delivered to the ink supplying devices under such pressure as to secure certainty and uniformity in the ink supply.

With these and other objects in view, the invention consists in certain constructions and improvements, a detailed description of which will be given in connection with the accompanying drawings, in which—

Figure 1 is a side elevation, partly broken away, of so much of a printing machine as is necessary for an understanding of the invention;

Fig. 2 is a plan view, certain parts being broken away and certain parts being omitted, of the construction illustrated in Fig. 1, showing one embodiment of the invention, a detached form member carrying a form a plurality of columns wide being illustrated with the columns in their proper relation to the ink supplying devices;

Fig. 3 is a vertical section on an enlarged scale of the ink supply reservoir and one of the ink supplying pumps; and

Figs. 4 and 5 are views on enlarged scales, in plan and cross section, respectively, of the ink delivery nozzles illustrated in Fig. 2.

Referring now to the drawings, the invention is shown as employed in connection with the printing machine the printing members of which are rotary couples including a form cylinder 1, and impression cylinder 2 suitably mounted in the frame 3 of the machine, although it will be understood that if desired the invention is capable of use with machines other than rotary machines. Ink may be delivered to the form cylinder as desired. In the construction illustrated there is provided a pair of form rolls 4 which take in from distributing cylinder 5 with which coöperate a plurality of distributing rolls 6. While the construction illustrated is effective for the purpose, it will be understood that this train of rolls is not essential to the machine, and that any or all of such rolls may be omitted as may seem necessary or desirable.

In machines embodying the invention there is provided a plurality of ink supplying devices by which ink is supplied for the form, one such device preferably being provided for each column of the form, and these devices being independent of each other so that the ink delivered by each may be varied independently of the others, and the ink is supplied to the form columns or sections under pressure and in regular quantities by separate pumps so that the ink is forced to the distributing cylinder or other ink-receiving member with certainty and uniformity. These ink supplying devices may vary somewhat in their construction, but in machines embodying the invention in its preferred form these devices will be in the form of small delivery nozzles 7 suitably mounted on the frame of the machine and having their delivery orifices arranged side by side and in line, each delivery orifice being, as shown, the width of one column of

the form to which ink is to be supplied. These nozzles 7 may be of any suitable construction. As illustrated, the bottom wall of the nozzles is formed of a plate 8 bolted by flanges 9 to a cross frame 10 suitably secured in the machine. This bottom plate 8 is common to all the nozzles, and is of a length sufficient to provide the necessary number.

The plate 8 is illustrated curving upwardly, as indicated at 11, so as to deliver upwardly between the distributing cylinder 5 and roll 6. The separate nozzles are formed on common plate 8 by curved side walls 17 which diverge from the rear sides of the nozzles, and cover plates 18, preferably separate for access to the different nozzles. The side walls 17 carry nipples 13 having inlet openings 14 communicating with independent ink supply pipes, and are shown as secured to plate 8 by screws 15 and the cover plates 18 are secured in position to plate 8 by screws 19. As illustrated, the nozzles are arranged with their delivery orifices side by side and close to each other with each nozzle supplying ink to a column of the form. It will be understood, however, that the nozzles may supply sections or divisions of the form of greater or less dimensions in columns.

The ink delivery nozzles or other ink delivering and distributing devices are fed with ink from a suitable source of ink supply, which is preferably a common one, the nozzles being connected with the source of supply through independent connections. In machines embodying the invention in its preferred form, the ink is delivered from the main source of supply to the delivery nozzles or reservoirs under pressure, this being preferably accomplished by providing a series of pumps, one for each nozzle, and in the best constructions means will be provided whereby the amount of ink delivered by each pump may be varied. In order that this regulating and adjusting means may be readily accessible, the supply reservoir or fountain is located on the outside of the machine and has mounted therein the pumps by which the ink is supplied. In the construction illustrated, the supply fountain is marked 20 and is located on the outside of the machine, being supported on the frame by brackets 21. From the supply fountain independent conduits, as pipes 22, lead to the delivery nozzles. Each delivery nozzle is connected with its pipe in any suitable manner to form a tight joint, as by forming the end of the pipe 22 with a head 23 which abuts against the nipple 13 before referred to, connection being made by a threaded union 24 taking over the head 23 and screwing onto nipple 13. Located in the main fountain 20 are a plurality of pumps, one pump being provided for each of the pipes 22 which are secured to their respective pumps by means of suitable unions 25.

The particular type and construction of pump employed for delivering ink to the ink pipes may be widely varied, as may be the means for effecting adjustment or regulation of the ink delivered from each pump. A convenient construction, however, is that illustrated, in which the pumps are small plunger pumps and are driven through suitable devices from a common shaft. The construction of each pump is identical, and a description of one will suffice for all. One of these pumps is illustrated in Fig. 3. In the particular construction there shown, the fountain has secured therein a casting 26 in which is formed a suction chamber controlled by a ball valve 27 and a delivery controlled by a ball valve 28, one of these being provided for each pump. The pump itself comprises a frame 29 carrying at its lower end a plunger 30, the frame being formed to provide above the plunger an abutment 31. This frame is reciprocated vertically to effect suction and delivery by means of an eccentric disk 32 carried on a driving shaft 33, the eccentric disks for all the pumps being carried on this shaft. The eccentric disk 32 on the rotation of the shaft bears against the abutment 31 and causes the plunger to operate to deliver ink through the valve 28 controlling the delivery chamber. In the particular construction illustrated, the delivery stroke of the plunger is always the same. To provide for regulating the adjustment of the amount of ink delivered by each pump, means are provided for varying the suction stroke of the pump. While the means for effecting this may be somewhat varied, in the construction illustrated there is provided a movable abutment which is in the form of a screw 34 having at its lower end a head 35 and at its upper end a milled head 35′ by which the screw may be adjusted, this milled head being on the outside of the fountain. This screw 34 passes through the upper part of the frame 29, before referred to, and the head 35 is engaged by the eccentric disk 32, causing the pump to be lifted for the suction stroke. It will be seen that by varying the position of head 35 of the screw vertically with respect to the eccentric disk 32, the lift or suction stroke of the pump will be varied, and thus the quantity of ink delivered by the pump at each reciprocation thereof to vary. Furthermore, it will be observed that with the construction employed, the parts through which this adjustment are obtained are conveniently located on the outside of the machine, so that the desired adjustment can be made while the machine is running, and at the same time afford a very simple

means for permitting an adjustment to be made quickly.

The shaft 33 of the machine which operates the pumps may be driven in any suitable manner. In the particular construction illustrated, where a distributing cylinder as 5 is employed, the shaft 33 may be driven from the cylinder shaft and in the best constructions the shaft will be driven through frictional driving means, so that a very nice degree of adjustment as to the speed of the shaft may be obtained. In the particular construction illustrated, the shaft 36 of the distributing cylinder 5 is provided beyond its journals with a friction disk 37 with which coöperates a friction wheel 38 carried on a shaft 39 suitably journaled in hubs 40. This shaft is provided at one end with a worm 41 which engages with a worm-wheel 42 on the end of shaft 33. The friction-wheel 38, before referred to, is keyed on the shaft 39 so as to have a movement along the same, whereby it may be brought into different driving positions with the disk 37 and its speed regulated to a great degree of nicety. The friction-wheel may be moved along the shaft 39 in any suitable manner. In the construction illustrated, there is provided a nut 43 having yoke arms 44 which take against hubs 45 on the wheel 38. This nut is operated by means of a threaded shaft 46 journaled in hubs 47 and turned by means of a hand-wheel 48. With this construction it will be seen that by one adjustment the speed of all the pumps may be varied simultaneously, and consequently the quantity of ink delivered by them may be varied likewise. At the same time each pump may be adjusted independently of the others to vary the amount of ink delivered by it.

While the construction illustrated and described is one which is effective for carrying out the invention, it will be understood that changes and variations may be made in the arrangement of the device shown and described and that the invention is not to be limited to such arrangement and construction.

What is claimed is:—

1. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink conduits, one for each column, arranged side by side for delivering an independent supply of ink for each column, an ink pump for each conduit, means for supplying ink to said pumps, and means for distributing the ink delivered from the conduits.

2. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink conduits, one for each column, arranged side by side, for delivering an independent supply of ink for each column, an ink pump for each conduit, means for supplying ink to said pumps, means for distributing the ink delivered from the conduits, and means for regulating the supply of ink delivered by each pump independently of the others.

3. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink conduits, one for each column, arranged side by side, for delivering an independent supply of ink for each column, an ink pump for each conduit, means for supplying ink to said pumps, means for distributing the ink delivered from the conduits, and means for simultaneously regulating the ink supplied by a plurality of said pumps.

4. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink conduits, one for each column, arranged side by side, for delivering an independent supply of ink for each column, an ink pump for each conduit, means for supplying ink to said pumps, means for distributing the ink delivered from the conduits, and means for regulating the supply of ink of each pump independently of the others and for stopping said supply of ink of each pump independently of the others.

5. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink delivery nozzles, one for each column, arranged side by side for delivering an independent supply of ink to each column, a supply reservoir, independent connections from the supply reservoir to each delivery nozzle, a plurality of pumps in the supply reservoir, one for supplying each delivery nozzle, and means for regulating the quantity of ink supplied by each pump independently of the others.

6. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of separate ink delivery nozzles, one for each column, arranged side by side for delivering an independent supply of ink to each column, a supply reservoir, independent connections from the supply reservoir to each delivery nozzle, a plurality of pumps located in the supply reservoir for supplying each delivery nozzle with ink under pressure, and means for regulating the ink supplied to each delivery nozzle independently of the others.

7. In an inking mechanism for printing machines, the combination with a distributing cylinder of an ink supply reservoir located on the outside of the machine, a plu-

rality of ink delivery nozzles having their delivery orifices arranged side by side along the distributing cylinder, independent connections from each delivery nozzle to the main supply reservoir, means in the supply reservoir for delivering ink to the delivery nozzles, and means at the supply reservoir for varying the ink supplied to each delivery nozzle independently of the others.

8. In an inking mechanism for printing machines, the combination with a distributing cylinder of an ink supply reservoir located on the outside of the machine, a plurality of ink delivery conduits having their delivery orifices arranged side by side along the distributing cylinder, independent connections from the delivery conduits to the supply reservoir, a plurality of pumps in the supply reservoir, one for each conduit, and means for regulating the amount of ink supplied by each pump independently of the others.

9. In an inking mechanism for printing machines, the combination with an ink supply reservoir, of a plurality of independent ink delivery conduits for different columns or sections of the form connecting with the supply reservoir, ink distributing devices for distributing the ink delivered by said conduits, a plurality of plunger pumps in the supply reservoir, one for each conduit, and means for controlling each pump independently of the others to vary the amount of ink delivered by the pumps.

10. In an inking mechanism for printing machines, the combination with an ink supply reservoir, of a plurality of independent ink delivery conduits for different columns or sections of the form connecting with the supply reservoir, ink distributing devices for distributing the ink delivered by said conduits, a plurality of pumps delivering ink from the supply reservoir, one for each conduit, and means for controlling each pump to regulate the amount of ink delivered and to stop the delivery of one or more of said pumps.

11. In a printing machine, the combination with a printing couple, of a plurality of separate ink conduits for delivering an independent supply of ink for different sections of the form, pumps for supplying ink to the conduits, means for simultaneously regulating the amount of ink delivered by all the conduits, and means for distributing the ink supplied by the conduits.

12. In a printing machine, the combination with a printing couple, of a plurality of separate ink conduits for delivering an independent supply of ink for different sections of the form, pumps for supplying ink to the conduits, means for simultaneously regulating the ink delivered by all the conduits, means for regulating the delivery of each conduit independently of the others, and means for distributing the ink supplied by the conduits.

13. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink delivery conduits, one for each column, for delivering an independent supply of ink for each column, a supply reservoir, a plurality of pumps taking from the supply reservoir, one for supplying each conduit, and means for simultaneously regulating the quantity of ink supplied by all the pumps.

14. In a printing machine, the combination with a printing couple the form member of which carries a form a plurality of columns wide, of a plurality of separate ink delivery conduits, one for each column, for delivering an independent supply of ink to each column, a supply reservoir, a plurality of pumps taking from the supply reservoir, one for supplying each conduit, means for simultaneously regulating the quantity of ink supplied by all the pumps, and means for regulating the quantity of ink supplied by each pump independently of the others.

15. In a printing machine, the combination with a printing couple, of a plurality of separate ink delivery conduits for delivering an independent supply of ink for different sections of the form, a supply reservoir, and a plurality of pumps taking from the supply reservoir, one for supplying each conduit with ink.

16. In an inking mechanism for printing machines, feeding openings through which ink is fed for different columns or sections of the matter to be printed, distributing devices, reciprocating pumping mechanism for feeding the ink through the openings to the distributing devices for the different columns or sections, and an ink supply for the pumping mechanism.

17. In an inking mechanism for printing machines, feeding openings through which ink is fed for different columns or sections of the matter to be printed, distributing devices, a series of plunger pumps for feeding the ink through the openings to the distributing devices for the different columns or sections, and an ink supply for the pumps.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

BRUCE C. WHITE.

Witnesses:
RICHARD KELLY,
HAROLD M. TILLINGHAST.