R. M. DAVIDSON.

INKING APPARATUS FOR PRINTING MACHINES.

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904,312. Patented Nov. 17, 1908.

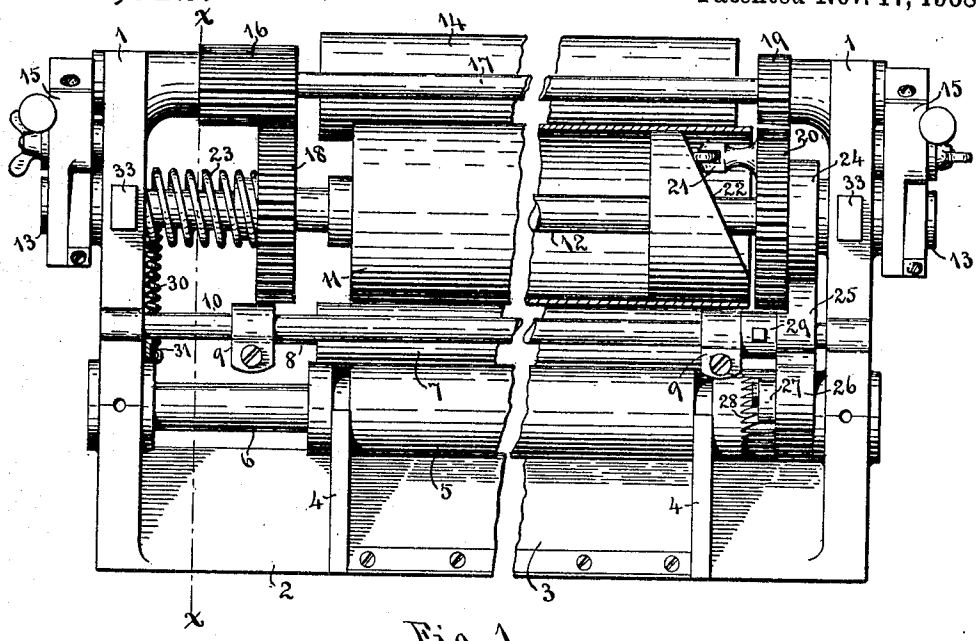


Fig. 1.

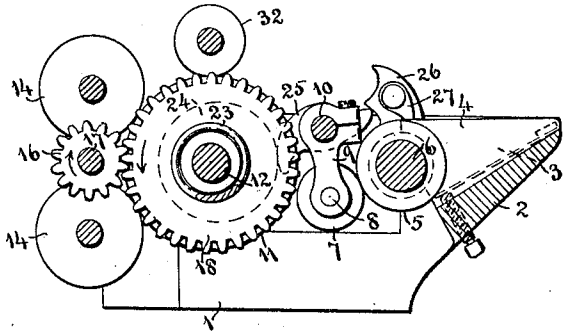


Fig. 2.

WITNESSES:

M. E. Verbeck

INVENTOR

Roderick M. Davidson

BY

Eugene Diven

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RODERICK M. DAVIDSON, OF ELMIRA, NEW YORK.

INKING APPARATUS FOR PRINTING-MACHINES.

No. 904,312. Specification of Letters Patent. Patented Nov. 17, 1908.

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To all whom it may concern:

Be it known that I, RODERICK M. DAVIDSON, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Inking Apparatus for Printing-Machines, of which the following is a specification.

This invention relates to improvements in the distributing cylinders in inking apparatus for printing machines and the manner of applying the ink thereto; my object being to provide a differential drive for the distributing cylinder, whereby the number of longitudinal reciprocations of the cylinder, relatively to the rotations thereof, will be greatly reduced to effect a comparatively slow sliding motion of the cylinder against the inking rollers; and a further object being to provide means for changing the point of application of the ductor roller to the distributing cylinder at each revolution thereof.

I attain my objects by constructing the inking apparatus in the manner illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of the apparatus; and Fig. 2, a vertical section thereof on the line x—x in Fig. 1.

Like numerals refer to like parts in the several views.

The frame of the inking apparatus comprises the two side-plates 1, 1, joined together by the cross bar 2, the latter being set at an angle to form the ink fountain 3, the ends of which are closed by partitions 4, 4, preferably formed integrally with the cross bar 2. This frame will be secured to the frame of the printing machine in any suitable manner, in position for the inking rollers to properly contact with the type-, or plate-cylinder. The fountain roller 5, carried by the shaft 6, closes the ink fountain, and operates to conduct the ink therefrom in the usual manner, said roller being provided with grooves to receive the partitions 4 and close the ends of the fountain. The fountain is also provided with the usual adjustable bottom plate, set up by adjusting screws against the roller 5, to regulate the flow of ink from the fountain. A ductor roller 7, carried by a shaft 8, is suspended by means of the hangers 9 from the oscillating bar 10, in position to swing back and forth between the fountain roller 5 and the distributing cylinder 11. This distributing cylinder is in the form of a hollow metal shell fastened to heads at each end, said heads being in turn fastened to the shaft 12, which is mounted to rotate and slide longitudinally in boxes 13, formed upon each of the side-plates 1, 1, of the frame. Contacting with the distributing cylinder are the composition inking rollers 14, 14, the upper of said rollers being omitted from the plan view shown in Fig. 1. These inking rollers are mounted in adjustable boxes 15, in the usual manner, in order that they may be set at suitable distances apart around the cylinder 11, to correspond with the diameter of the type-, or plate-cylinder.

Motion is imparted to the distributing cylinder and to the several rollers through the pinion 16 fastened upon the shaft 17, which passes across the frame between the rollers 14. This pinion 16, when the inking apparatus is in place upon the printing machine, will mesh in with the gear train which drives the type-, or plate-cylinder, and will receive motion therefrom. On the shaft 12, a gear wheel 18 is fastened to mesh with the pinion 16, and said pinion is made of sufficient width to permit the gear 18 to reciprocate longitudinally in mesh therewith, in accordance with the longitudinal throw of the distributing cylinder. The longitudinal reciprocations of the distributing cylinder are produced by means of the pinion 19, fastened to the shaft 17, and the gear 20, which is loosely mounted upon the shaft 12; said gear being provided with an arm 21, which carries a roller in contact with the cam formed by the inclined outer surface 22 of the cylinder head adjacent thereto. By giving the pinion 19 a lesser number of teeth than the pinion 16, and the gear 20 a larger number of teeth than the gear 18, or vice versa, a differential rotary motion is imparted to the distributing cylinder and the roller arm 21: For instance, if the pinion 16 have fourteen teeth, and the pinion 19 thirteen teeth, the gear 18 thirty-six teeth, and

the gear 20 thirty-seven teeth, it will be evident that, for each revolution of the pinion 16, the roller arm 21 will lag behind the cylinder one tooth, thereby imparting a comparatively small relative movement of the roller arm around cam surface 22, and causing only a partial reciprocation of the distributing cylinder for each revolution of the cylinder. Heretofore, devices have been employed whereby one complete back and forth movement is imparted to the distributing cylinder for each revolution thereof. For high speed machines particularly, and for machines running at slow speeds, as well, this causes a too rapid longitudinal motion of the distributing cylinder against the inking rollers.

It will be readily seen that by means of my differential motion a very material reduction in the speed of longitudinal travel for the distributing cylinder may be attained, according to the relative number of teeth on the differential gears.

To hold the cylinder cam head against the roller arm 21, and provide for the return stroke of the cylinder, a spring 23 is mounted at the opposite end of the shaft 12, between the frame plate and the gear 18.

To impart motion to the fountain roller, I provide a cam 24, at the outward side of the gear 20, in contact with which is the rock arm 25, mounted upon the oscillating bar 10. This rock arm engages an oscillating arm 26, loosely mounted upon the shaft 6 and held against the rock arm by a suitable spring, (not shown). The arm 26 carries a pawl 27, which engages ratchet teeth 28 formed on the end of the fountain roller 5; so, that for each revolution of the cam 24 a partial revolution is imparted to the fountain roller in the usual manner. By means of an adjusting collar 29, engagement is established between the rock arm 25 and the rod 10 to oscillate said rod and throw the ductor roller 8 into contact with the fountain roller. The return throw of the ductor roller, for contact with the distributing cylinder, is attained by means of a spring 30 fastened to the left hand frame plate and attached to an arm 31 depending from the oscillating bar 10; this spring also serving to hold the rock arm in contact with the cam 24. By fastening the cam 24 to the gear 20, it will be evident that the oscillations of the ductor roll will be thrown out of time with the revolutions of the distributing cylinder; thereby changing the points of contact between the ductor roll and the cylinder at each revolution thereof and causing a more even feed of the ink from the fountain to the surface of the distributing cylinder. For spreading the ink upon the distributing roller before it reaches the inking rollers, a rider roller 32 is mounted in boxes 33, above the distributing cylinder, and in frictional contact therewith. More than one of these riders may be employed if desired.

Having thus described the several parts of my improved inking apparatus, and the manner of operation thereof, what I claim as my invention, and desire to secure by Letters Patent is—

1. The combination, with a distributing cylinder mounted to rotate and to longitudinally reciprocate, of a gear wheel adapted to rotate the cylinder, a pinion in mesh with said gear wheel, a second gear wheel in axial alinement with the first gear wheel adapted to rotate independent of the cylinder adjacent one end thereof, a pinion in mesh with said second gear wheel on the same shaft with the first pinion, each pair of pinions and gear wheels being provided with a different number of teeth whereby a differential motion is imparted to the two gear wheels, and means on the second gear wheel coöperating with means on the cylinder for imparting longitudinal motion to the cylinder.

2. The combination, with a distributing cylinder mounted upon a shaft adapted to reciprocate in its bearings, of a gear wheel adapted to rotate the shaft, a second gear wheel loosely mounted on the shaft at one end of the cylinder, a shaft carrying differential pinions in mesh with said gear wheels, a roller arm carried by the second gear wheel in engagement with a cam surface on the cylinder head, and a spring adapted to press the cylinder against the roller arm.

3. The combination with a distributing cylinder, an ink fountain and fountain roller, and means for imparting motion to the cylinder and roller, of a ductor roller, means operated at each revolution of the cylinder for moving the ductor roller back and forth between the fountain roller and cylinder, and means for changing the time of the movements of the ductor roller with relation to the revolution of the cylinder, whereby the point of application of the ductor roller to the cylinder will be changed at each revolution of the cylinder.

4. The combination with a distributing cylinder, an ink fountain and fountain roller, and means for imparting motion to the cylinder and roller, of a ductor roller, a cam in axial alinement with the cylinder, means for rotating the cam at a different speed from that of the cylinder, and means operated by the cam at each revolution of the cylinder for moving the ductor roller back and forth between the fountain roller and cylinder, whereby the point of application of the ductor roller to the cylinder will be changed at each revolution of the cylinder.

5. The combination, with a distributing

cylinder, an ink fountain and a fountain roller, of means for rotating the cylinder, a cam rotated by said means at a different speed from that of the cylinder, a rock arm carried by an oscillating bar in engagement with said cam, a ratchet gear actuated by said arm to rotate the fountain roller, and a ductor roller supported on hangers from the oscillating bar between the fountain roller and cylinder, said ductor roller being moved back and forth between the fountain roller and cylinder by the action of the rock arm.

In testimony whereof I have affixed my signature, in presence of two witnesses.

RODERICK M. DAVIDSON.

Witnesses:

A. S. DINEN,

M. E. VERBECK.