(No Model.)

C. B. COTTRELL.

INKING APPARATUS FOR PRINTING MACHINES.

No. 455,897. Patented July 14, 1891.

Fig. 1.

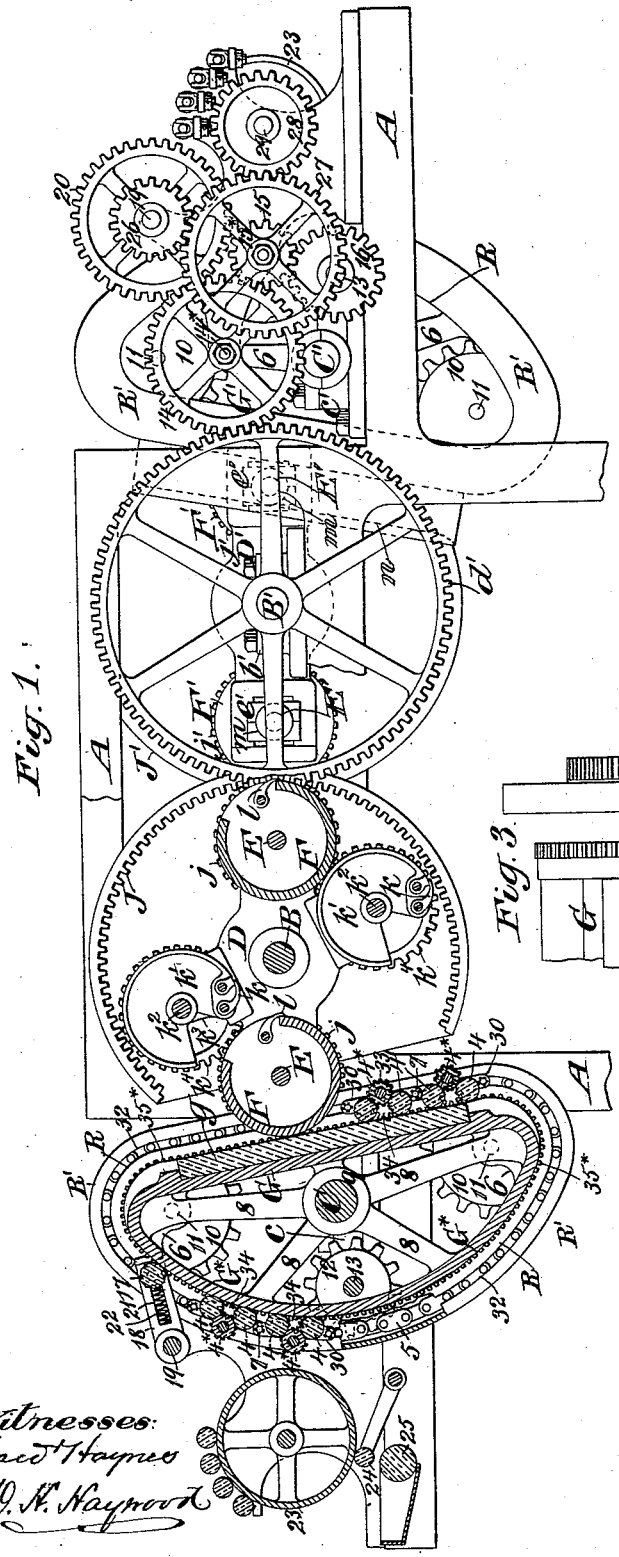


Fig. 4.

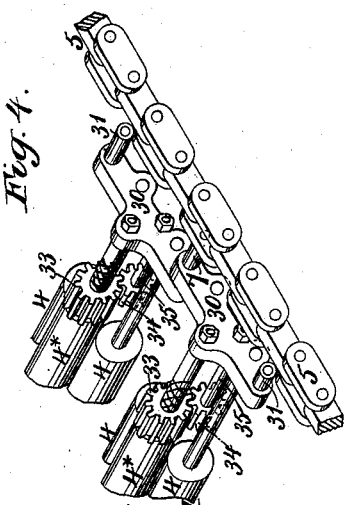


Fig. 3.

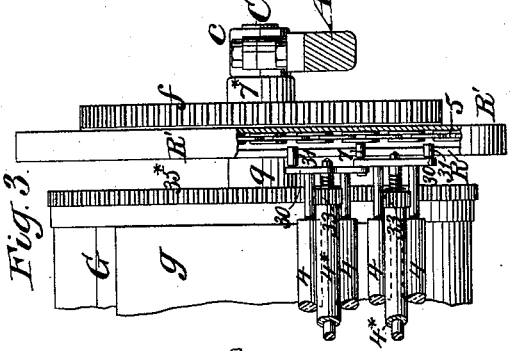
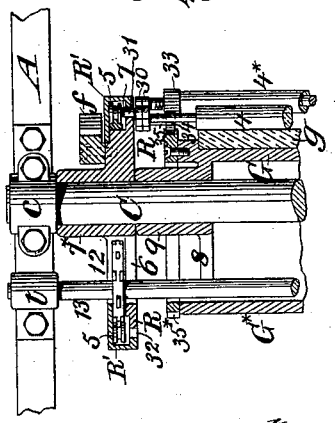


Fig. 2.



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INKING APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 455,897, dated July 14, 1891.

Application filed February 27, 1891. Serial No. 383,021. (No model.)

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Westerly, in the county of Washington and State of Rhode Island, have invented a new and useful Improvement in Inking Apparatus for Printing-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention is more especially intended for printing-machines such as are described in my United States patent, No. 448,775, dated March 24, 1891, the leading characteristic of which is that the oscillating form carrier or bed is combined with the rotary impression-cylinder, the axis of which is caused to revolve about a fixed axis, and I will proceed to describe my invention with reference to the accompanying drawings in its application to such a machine, and will afterward point out its novelty in claims.

Figure 1 represents in part a side elevation and in part a vertical section parallel with the sides of those parts of the printing-machine necessary for the illustration of my invention. Fig. 2 is a horizontal sectional view of one end of the oscillating form carriers or beds and of the inking apparatus thereto applied. Fig. 3 represents a face view of one end of the form carrier or bed and of the inking apparatus attached thereto. Fig. 4 is a perspective view of parts of the inking apparatus on a larger scale than Figs. 1, 2, and 3.

A designates part of the side framing of the machine; B B′, the shafts of the rotary cylinder-carriers D D′, in which are journaled the shafts E E′ of the rotary impression-cylinders F F′ and also the shafts k^2 of the gripper arms or disks k', to which are attached the grippers k, which take the sheets from the grippers l of the impression-cylinders. C C′ are the shafts of the oscillating form carriers or beds G G′.

The parts above mentioned, except the form-carriers, are the same as in the printing-machine described in my patent hereinabove mentioned. The form-carriers, instead of being simply flat plates, are hollow castings of a form substantially resembling segments of cylinders comprising flat portions G or G′ or beds proper and rounded backs G*, the exterior cylindric faces of which constitute ink-distributing surfaces, over which and over the faces of the forms g on the beds G G′ run a series of ink-rollers 4 4*. These castings G G* and G′ G* are made with arms 8 and hubs 9, which are fast on the shafts C C′. The said form-carriers also differ from those in the above named patent in that, instead of their grooved or flanged portion n engaging with the cylinder-carriers D D′ by means of projections m specially provided on the latter carrier, the engagement is made by means of the ends of the impression-cylinder shafts E E′, the projection m being dispensed with.

The ink-rollers 4 4* for each oscillating form carrier or bed are carried by endless carriers 5, which surround the shafts C C′ of their respective carriers. Each of these endless carriers 5 consists of two endless chains, one on each side of the form-carrier, the said chains being furnished at certain intervals with rollers 7, running on guides R of a segmental form corresponding with that of the form-carriers G G′ and their ink-distributing surfaces G*. The said guides, of which there is one for each of the two endless chains 5 of the ink-roller carrier of each bed, consist of tracks made with arms 6 and hubs 7*, which are secured fixedly on the form-carrier shafts C C′. The endless chains 5 engage each with two sprocket-wheels 10, which are journaled at 11 in the form-carriers or the guides R, the said sprocket-wheels, which derive motion from the chains themselves, serving to ease the chains as they turn between the faces and backs of the form-carriers. The two endless chains for each form-carrier are driven by sprocket-wheels 12 on a driving-shaft 13, which passes through the form-carrier, as shown in Figs. 1 and 2, and which work in fixed bearings t in the side frames A of the machine, there being a suitable opening between the arms 8 of the form-carrier to permit its oscillation without interference from said shaft. The driving-shafts 13 may be driven in any suitable manner—as, for instance, as shown at the right hand of Fig. 1, through a train of gearing 14 15 16 from the gear d' on their respective impression-cylinder carrier, the said gears 14 15 freely turn-

ing, respectively, on fixed studs 14* 15*, secured in the machine-framing, and the gear 16 being fast on the shaft 13.

The ink is supplied to the distributing-surface G* of each form carrier or bed by means of a revolving duct-roller 17, which turns in journal-boxes which are fitted to slots 21 in the arms 18 of a rotary carrier, the shaft 19 of which is furnished with a spur-gear 20, through which it derives motion from the stud-gear 14, hereinbefore mentioned.

The duct-roller 17 and carrier 18 of one form-bed are shown at the left hand of Fig. 1 and the gearing for driving the duct-roller of the other bed is shown at the right of Fig. 1.

Behind the journal-boxes of the duct-rollers 17 springs 22 are arranged in the slots 21 of its carrier-arms 18. These springs tend to force the said boxes and the duct-roller outward from the axis of the carrier, but permit it to move toward the said axis to accommodate itself to the oscillating movements of the form-carrier. The said springs also press the duct-roller 17 against the ink-distributing cylinder 23, from which the said roller takes its ink. The cylinder 23 receives ink from a duct-roller 24, which takes it from a fountain-roller 25. The said cylinder derives motion from the shaft 19 of its respective duct-roller carrier through a spur-gear 26 on said shaft gearing with and driving an intermediate gear 27, which turns loosely on the stud 15*, before mentioned, and drives a gear 28 on the shaft 29 of the said cylinder.

The ink-rollers 4 4*, carried by the endless chains or carriers 5, are represented as consisting of form-rollers 4 and vibrating rollers 4*, one set of rollers 4 4* for each of the impression-cylinders F or F′, to ink their respective forms prior to the operation of each cylinder. Each set of rollers is represented, as shown in the perspective view, Fig. 4, as consisting of two pairs of form-rollers 4 and two vibrating rollers 4*, one of the latter for each pair of form-rollers. The form-rollers 4 of each pair are journaled at each end in one of two yokes 30, which are connected together at their adjacent ends by a pivot, which carries one of the rollers 7, hereinbefore mentioned, which run on the tracks of the guides R. At the other ends of the yokes 30 are rollers 31, (see Fig. 4,) which run on the said tracks, as shown in Fig. 3, the said rollers and the rollers 7, before mentioned, being confined to the guides R by flanges R′, which are secured to the exteriors of said guides, and between which and the said guides there are left only slots 32, of a width sufficient for the rollers 7 and 31 to run in. In Fig. 3 the flange R′ is represented as broken away to expose to view the guide R and the rollers 7 and 31, running on it. The ends of the shafts of the vibrating rollers 4* are secured firmly in their respective yokes 30. The form-rollers 4 are rotated by contact with the ink-distributing surface G* and with the form *g*. The vibrating rollers 4* derive rotary motion through spur-gears 33, fast upon them, from spur-gears 34, turning freely on short studs 35, carried by the yokes 30, the said gears 34 being caused to rotate by running on toothed racks 35*, which are affixed to the form-carriers and which conform to the guides R, as shown at the right of Fig. 1. The movement of the endless chains by the sprocket-wheels 12 causes the ink-rollers 4 to roll alternately over the distributing-surface G* on the back of the form carrier or bed and over the form on the bed, and so to take the ink from said surface and give it to the form. In this operation the flanges R′ so confine the rollers 7 and 31 to the guides R, confine the gears 34 to the racks 35*, and confine the chains to the sprocket-wheels 12 that perfect operation of all the parts is insured.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a printing-machine, the combination, with an oscillating bed or form-carrier, of an ink-distributing surface arranged at the back of said bed or carrier in fixed relation therewith, ink-rollers and an endless carrier oscillating with said bed or form-carrier, and an ink-distributing surface for carrying said rollers in contact alternately with said distributing-surface and with a form on said bed or form carrier, substantially as herein described.

2. The combination, in a printing-machine, of a revolving cylinder-carrier and a rotary impression-cylinder journaled therein, an oscillating bed or form-carrier and a shaft for the same, an ink-distributing surface on the back of said bed or form-carrier, an endless ink-roller carrier surrounding the said shaft, and ink-rollers in said carrier arranged to run over the said surface and over a form on the bed or form-carrier, substantially as herein set forth.

3. In a printing-machine, the combination, with a revolving cylinder-carrier, a rotary impression-cylinder journaled in said carrier, and an oscillating bed or form-carrier and a shaft for the same, of an ink-distributing surface on the back of said bed or form-carrier, endless chains surrounding the said shaft, supporting-wheels and guides for the said chains attached to the bed or form-carrier, and ink-rollers carried by said chains, substantially as herein set forth.

4. In a printing-machine, the combination, with a revolving cylinder-carrier, a rotary impression-cylinder journaled therein, and an oscillating bed or form-carrier and a shaft for the same, of an ink-distributing surface on the back of said bed or form-carrier, ink-rollers and endless chains for carrying the same surrounding said shaft, supporting-wheels and guides for the said chains attached to said carrier, a separate driving-shaft for said chains, and chain-wheels on said driving-

shaft engaging directly with the said chains, all substantially as herein described.

5. The combination, with the oscillating bed or form-carrier having an ink-distributing surface on its back, of a duct-roller and a rotary carrier within which and toward and from the axis of which the said roller is capable of a movement to accommodate itself to the oscillating movement of said surface, substantially as herein set forth.

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