O. L. RAABE.

WEB PRINTING MACHINE.

APPLICATION FILED JAN. 22, 1917.

1,343,931.

Patented June 22, 1920.

2 SHEETS—SHEET 1.

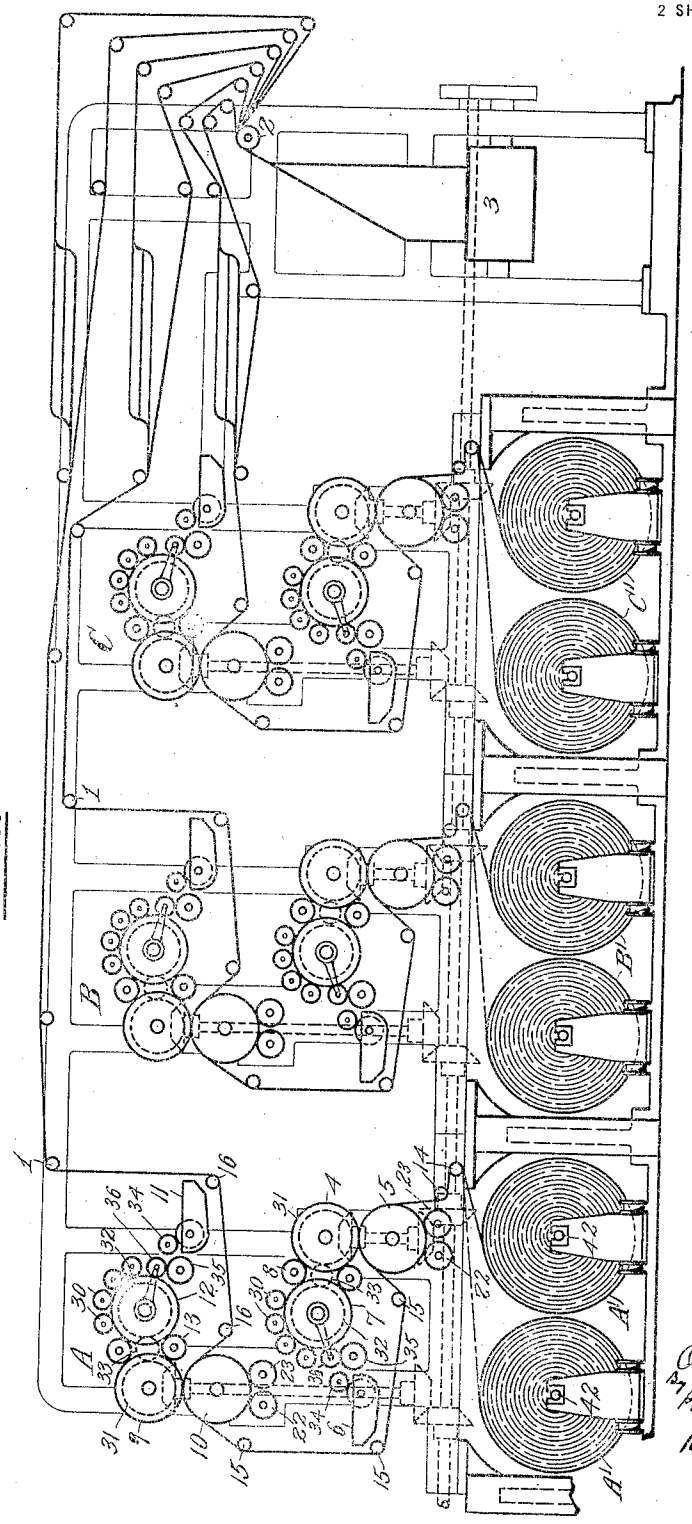


FIG. 1.

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2 SHEETS—SHEET 2.

FIG. 3.

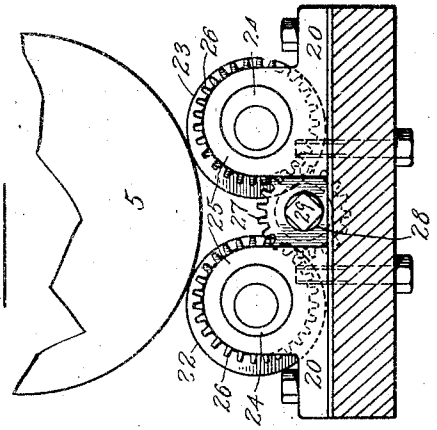


FIG. 4.

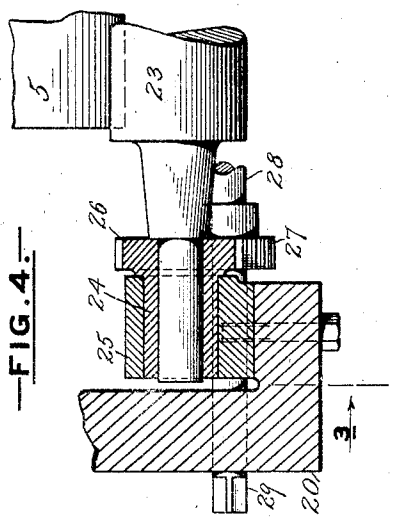
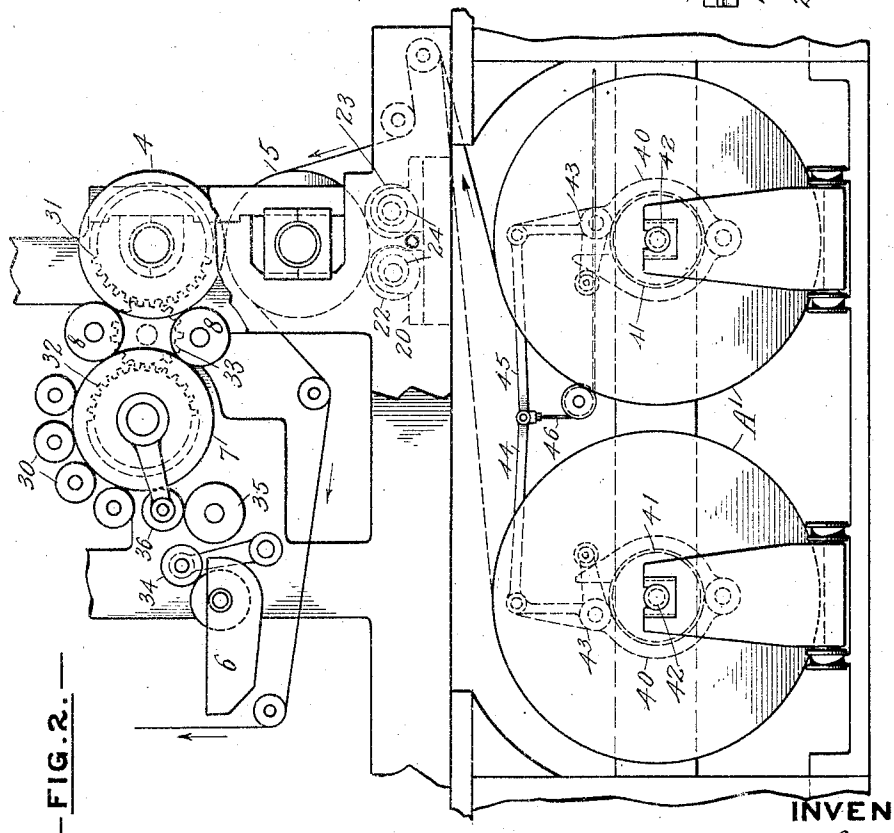


FIG. 2.



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UNITED STATES PATENT OFFICE.

OTTO L. RAABE, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

WEB-PRINTING MACHINE.

1,343,931. Specification of Letters Patent. Patented June 22, 1920.

Application filed January 22, 1917. Serial No. 143,584.

To all whom it may concern:

Be it known that I, OTTO L. RAABE, a citizen of the United States, residing at Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Web-Printing Machines, 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 web printing machines.

It is the especial object of the invention to provide an arrangement in web printing machines, whereby the printing couples and the inking mechanism therefor are so positioned that the couples occupy a place on the outside of the inking and other mechanism, so that the web may be led through the couples from the outside around the inking mechanism and the pressman has a clear view of what he is doing and a clear space to work in.

A further object of the invention is to provide a web printing machine comprising a plurality of printing and perfecting couples thus arranged, each printing and perfecting couple forming a unit, these couples being spaced apart so that the webs may be led through the printing couples from the outside, the cylinders of the couples being arranged vertically and offset with respect to each other, with the inking mechanism for each couple arranged inside the couples one above the other, thus effecting a great saving in space in a pressroom.

It is a further object of the invention to provide an improved construction for adjusting the impression cylinder to vary the impression, for supporting the impression cylinder so as to prevent "throwing" or jumping when the cylinder is running at printing speed, and which shall not obstruct convenient access to the running parts of the press, and which shall also act, when the impression cylinder is a blanketed cylinder, to iron or smooth out the blanket, so as to avoid the bolsters or ridges which are formed in the blanket because of the margins between the pages of the plates, and which are liable to cause breaking of the paper at such points, and also bad impression.

It is a further object of the invention to provide in printing machines an improved arrangement of the mechanism by which ink is transferred from the ink fountain to the distributing cylinder of the inking mechanism, so as to avoid as far as possible the jar or shock resulting from the translation of motion from the slow-running fountain roll to the fast-running distributers, and vice versa.

With these and other objects not specifically referred to in view, the invention consists in certain novel parts and combinations which will be hereinafter described in reference to the accompanying drawings, in which—

Figure 1 is an end elevation of a web printing and perfecting machine, showing a plurality of printing and perfecting units embodying the improved arrangement of the invention;

Fig. 2 is an end elevation partly broken away, showing the improved arrangement for preventing undue shock or jar in the inking mechanism and an arrangement for braking the web rolls;

Fig. 3 is an end elevation partly in section, showing the method of adjusting the impression cylinder, and for ironing out the blanket of that cylinder where such blanket is used, the impression cylinder being shown partly broken away, and

Fig. 4 is a detail sectional view of the mechanism for adjusting the ironing and impression adjusting means.

Referring now to the drawings, and particularly to Fig. 1, the invention has been illustrated as embodied in a web printing and perfecting mechanism employing a plurality of similar units, each unit being capacitated to print and perfect a web, although it will be understood that the invention may be, and is, intended to be, used with but a single web printing and perfecting mechanism. These mechanisms are indicated generally by the letters A, B and C, and in the particular construction illustrated, each of the printing and perfecting couples are four pages wide, the supply of web for each of the couples being obtained from rolls A′, A′, B′, B′, and C′, C′. These web rolls are preferably associated in pairs below their respective printing units, as shown. One of each of these sets of rolls is the working roll and the other a spare. With this arrangement a spare is always in position and takes up very little

space, which is important. The webs from all the units are or may be led over suitable web guides 1 to an associating mechanism 2 of any suitable character, and thence to a folder 3 of any usual or desired form.

The machine embodying the invention will include a plurality of printing couples which may be, as illustrated, printing and perfecting couples. These couples will be so arranged that the web or webs may be led through them from the outside, so that the pressman will have a clear field to work in and can without danger thread the web or webs. Preferably, to save space, the couples will be arranged in staggered or offset relation vertically of each other with the cylinders, where both members of the couple are cylinders, arranged vertically of each other, with their respective inking mechanisms on the inside of the cylinders. Such arrangement permits the couples and their accompanying inking and guiding mechanisms to be arranged in a relatively small space, thus economizing room in the pressroom, which in many instances is of prime importance. As shown, each of the units is similar as to arrangement and construction, and a detailed description of one will suffice for all and such description only will be given.

In the particular construction illustrated, referring particularly to the unit A, this unit comprises a printing couple the members of which are cylinders, including a plate cylinder 4 and impression cylinder 5, the impression cylinder being preferably located, for reasons hereinafter referred to, vertically below the plate cylinder. The usual inking mechanism, including fountain 6, distributer 7 and form rolls 8, are provided, and this inking mechanism is arranged on the inside, or, as shown, at the left of the plate cylinder 4. Unit A also includes a second printing couple which is, in the present instance, a perfecting couple, comprising plate cylinder 9 and impression cylinder 10, though if desired this couple could be used for color printing. This couple is inked from fountain roll 11, distributer 12 and form rolls 13. The inking mechanism for this couple is arranged, as shown, at the right of the couple, so as to leave the cylinders of the couple on the outside, the couples 4, 5, 9, 10 being thus in staggered or offset relation vertically to each other and each on the outside of their respective inking mechanisms, which are arranged above each other. The working web A′ is led first over suitable guide and tension rolls 14 through the printing couples 4, 5 from the outside and thence under and around the inking mechanism for this couple by guide rolls 15 to printing couple 9 and 10, and through this couple from the outside under the inking mechanism therefor by guide rolls 16 to the rolls 1, before referred to, over which it is led or guided to the associating mechanism.

It will be seen that by this arrangement, a very simple and compact arrangement is provided, taking up relatively little space and in which the cylinders of the printing couples are on the outside thereof, so that the pressman can lead the web through the couples around the inking mechanism and has a clear space in which to work, which is a feature of great practical importance.

Machines embodying the invention in its best form will include mechanism for adjusting the impression and for ironing or smoothing out the blankets of the impression cylinders, where such blankets are used. While this mechanism may vary somewhat, a very simple adjusting mechanism is that shown, and which preferably will be employed. As illustrated, there is provided a block or base 20 suitably supported in the frame of the machine on each side (only one block 20 being shown). In these blocks are supported a pair of rolls 22, 23 so that they may have a vertical adjustment. These rolls contact with the impression cylinder, as 5, of one of the printing couples, and the cylinder rests on the rolls, which extend the length of the cylinders. Various means for mounting these rolls, so as to have this vertical adjustment, may be employed. In this particular instance, these rolls are eccentrically mounted in sleeves 24 working in eccentric bearings 25. Each of the sleeves 24 is provided with a gear 26 which is in engagement with an actuator gear 27, these gears being rotated through gear 27 by means of a shaft 28 having a squared head 29, by turning which the gears are equally rotated and each of the rolls consequently simultaneously and equally moved, and the impression of the impression cylinders is varied as desired, and while the machine is in operation, and as the rolls are thus kept in close contact with the cylinder, it results that sagging and consequent "throwing" or jumping of the cylinder is prevented when running at printing speed, which is important, particularly with long cylinders.

When the impression cylinder is a blanketed cylinder, these rolls 22, 23 are made preferably of hard metal so that they will act as ironing or smoothing rolls to smooth or iron out the blanket on the cylinder and prevent the bolsters or ridges caused by the plate margins, which would tend to produce an imperfect impression and cause the paper to break at the margin points.

While these impression-adjusting and ironing rolls may be omitted from any couple, it will be understood that in machines embodying the invention in its best form,

such rolls will be provided for the impression cylinder of each printing couple, and where a plurality of couples are provided, for each impression cylinder of all the couples. The construction and operation of the rolls in each case will, however, be the same, and consequently but one has been described.

Machines embodying the invention in its best form will include an improved inking mechanism for each of the printing couples, which will preferably be the same for all, this mechanism being of such character that the shock or jar to the usual vibrating ductor rolls employed for transferring ink, and the fountain roll, which is due to the sudden translation of movement from the slow-running fountain roll to the fast running distributers, and vice versa, will be largely reduced, thus insuring longer life and more uniform action to the rolls, which are usually composition. This will be effected by controlling the speed of the ductor rolls so that when the ductor rolls are in contact with the fountain roll their surface speed will be greatly less than that of the distributing cylinder. This slowing down, in addition to avoiding shock or jar, with its consequent bad effects, also obviates a certain tendency, in certain constructions, of imparting an excess of motion to the fountain roll, which would cause an excess of feed of ink. While the means for slowing down the speed of the ductor rolls may be widely varied, in the construction illustrated there will be included a free-running transfer roll to which ink is delivered from the slow-running fountain roll by a ductor roll, and from which ink is delivered to the fast-running distributer cylinder, this free-running distributer roll being located between the fountain roll and the distributing roll.

Referring to Fig. 2, assuming that this figure shows the lower printing couple of unit A shown in Fig. 1, there are provided a pair of form rolls 8. Ink is delivered to these form rolls 8 from a large distributer cylinder 7 coöperating with the usual train of small inking rolls 30. This large distributer 7 is driven in the particular construction illustrated at the speed of the printing cylinder 4 through gears 31, 32 carried on the cylinder and distributer shafts, respectively, through intermediate gear 33. Ink is delivered to the large distributer cylinder 7 from the fountain 6 through a vibrating ductor roll 34 and an intermediate transfer or distributing roll 35 and a vibrating ductor roll 36 operated from the shaft of the distributer 7. The roll 35 is a free-running roll, that is, the roll is not positively driven, but is rotated through the rolls 34 and 36 coming in contact therewith alternately, the roll 36 breaking contact with roll 35 before roll 34 makes contact therewith, and vice versa. Thus the roll 35 slows down from the high speed given it by the roll 36, which runs at printing speed from contact with distributer 7 before the ductor roll 34 comes in contact therewith, thus giving a speed to roll 34 more nearly approximating the slow-running speed of the fountain roll. Injurious shocks or jars to the vibrating ductor roll 34 are thus obviated to a great extent and the life of this roll correspondingly increased. The vibrating ductors are driven in any usual or suitable manner to have vibrating motion, and no particular mechanism has been shown for this as it is not necessary for an understanding of the invention.

As before stated, preferably for each unit there will be provided a pair of web rolls A′, A′, one of which may be the working roll and the other a supply roll to be drawn upon when the working roll is exhausted. It is desirable in high speed machines to have brakes for braking the web rolls. Where a pair of rolls is employed for each printing mechanism, as in the present construction, it is desirable that means may be provided whereby both the rolls may be braked from a common point, a set of brakes thus operated from a common point being provided for each of the rolls, so that when the web roll is exhausted and the other roll brought into use this roll can be braked as desired without changing the braking system. This is effected in machines embodying the invention by providing a brake mechanism for both the working and idle rolls, which is operated from a convenient control point by a single operating mechanism. Any suitable form of braking mechanism may be employed, such as the usual band brakes 40, taking on friction brake pulleys 41 which are secured to the roll spindles 42. The web rolls are shoved into place on carriages and the roll spindles are secured to the brake pulleys so that the braking of the pulley will brake the spindle. These brake pulleys will remain in position in the machine, and are not removed when the roll is changed. The construction by which this is effected is a usual one, and hence has not been illustrated. The brake bands 40 are operated through the usual lever constructions 43. In machines constructed in accordance with the invention, however, these lever operating mechanisms 43 will be connected up so as to be simultaneously operated by a pair of connecting rods 44, 45 pivotally joined together, these rods being operated to set or free the brakes. The particular construction for operating these rods may, of course, be widely varied, but in the best constructions they will be oper-

ated from but a single source, as, for instance, from a cable 46 secured centrally of the rods and operated from some convenient point in the machine. Only one control is therefore necessary for each printing unit.

While the invention has been shown and described in its preferred form, it will be understood that other changes and variations may be made in the specific construction of the same without departing therefrom, and it is understood that such changes and variations will be made.

What is claimed is:

1. In a printing machine, the combination with a plurality of printing couples, the printing elements of which are superposed, of inking mechanism for each couple, the printing elements of each couple being arranged on the outside of the mechanism, a source of web supply, and means for guiding the web through the couples from the clear side around the inking mechanism.

2. In a printing machine, the combination with a plurality of printing couples, the cylinders of each couple being arranged vertically and the couples being arranged in staggered or offset relation vertically to each other, of inking mechanism between the couples, the cylinders of each couple being on the outside of the inking mechanism, a source of web supply, and means for guiding the web through the couples from the clear side and around the inking mechanism.

3. In a printing machine, the combination with a plurality of units, each unit including a plurality of printing couples, the cylinders of each couple being arranged vertically and the couples being arranged in staggered or offset relation to each other vertically, of inking mechanism for each couple arranged one above the other between the couples, the printing elements of each couple being on the outside of the inking mechanism, a source of web supply, and means for guiding the web through the couples from the clear side and around the inking mechanism.

4. In a printing machine, the combination with a plurality of units, each unit including a plurality of printing couples, the cylinders of each couple being arranged vertically and the couples being arranged in staggered or offset relation to each other vertically, of inking mechanism for each couple arranged one above the other between the couples, the printing elements of each couple being on the outside of the inking mechanism, a source of web supply, means for guiding the web through the couples from the clear side and around the inking mechanism, and means for associating the webs from all the couples.

5. In a printing machine, the combination with a plurality of units each including a plurality of printing couples, the cylinders of each couple being arranged vertically and the couples being arranged in staggered or offset relation to each other, of inking mechanism between the couples, the printing cylinders of each couple being on the outside of the inking mechanism, a source of web supply, and means for guiding the web through the couples from the clear side and around the inking mechanism.

6. In a printing machine, the combination with a plurality of units, each unit including a plurality of printing couples, the cylinders of each couple being arranged vertically and the couples being arranged in staggered or offset relation to each other vertically, of inking mechanism between the couples, the printing elements of each couple being on the outside of the inking mechanism, a source of web supply, means for guiding the web through the couples from the clear side and around the inking mechanism, and means for associating the webs from all the couples.

7. In a printing machine, the combination with a plurality of units, each including a printing and perfecting couple with the inking mechanisms for the couples arranged between them and the couples arranged on the outside, of a source of web supply located beneath each unit, and guides for guiding the web through the couples from the clear side around the inking mechanism.

8. In a printing machine, the combination with a plurality of units, each including a printing and perfecting couple with the inking mechanisms for the couples arranged between them, of a source of web supply located beneath each unit, guides for guiding the web through the couples from the clear side around the inking mechanism, and means for associating the webs from all the units.

9. In a printing machine, the combination of a plurality of printing couples supported one above the other from the same support, inking mechanism for each couple the printing elements of each couple being arranged on the outside of the mechanism, a source of web supply, and means for guiding the web through the couples from the clear side and around the inking mechanism.

In testimony whereof I have hereunto set my hand.

OTTO L. RAABE.