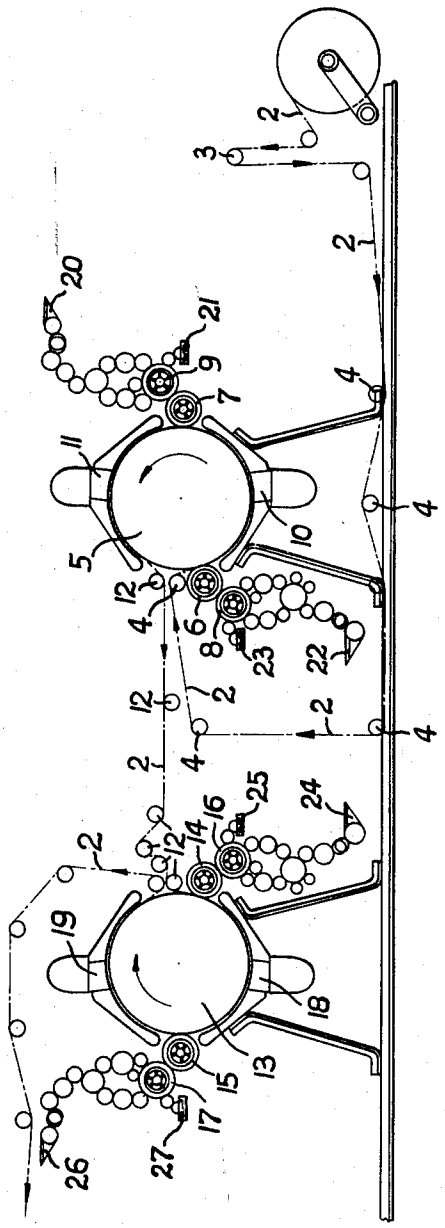
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DRYING MEANS FOR OFFSET ROTARY PRINTING MACHINE

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DRYING MEANS FOR OFFSET ROTARY PRINTING MACHINE

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This invention relates to an offset rotary printing press, more particularly for multi-color printing.

It is an object of the present invention to improve presses of this class so as to achieve a quality of printing which is equal, or even superior, to that of web fed roto-gravure printing or sheet fed offset printing presses.

A special object of the invention consists in the provision of means preventing the colors inadvertently mixing with each other on the paper and/or repelling each other upon mixing while wet on the paper.

Another object of the invention is to provide means for obtaining on web fed offset multicolor presses clear and beautiful tints and color effects of sufficient "depth," similar to that which can easily be obtained by offset sheet fed printing presses or rotogravure printing presses.

Still another object of the invention is to provide means for ensuring accurate register and a ready and convenient accessibility of the inking units.

With these and further objects in view, according to the present invention the inking and printing devices are arranged in such a way that not more than two printing or impression stations (including inking devices together with their plate and rubber offset cylinders) operate in conjunction with a common large impression cylinder. A drying device for the printed ink is arranged over the circumferential surface of the large impression cylinder and immediately following each rubber offset cylinder or printing station. Thus, the fresh ink printed on the paper web is dried immediately after each printing operation and before the printed web reaches the next offset cylinder or printing station so that the wet ink applied by the next impression will be applied to a dried web having the same physical condition as before the first printing impression rather than to a paper web carrying a wet ink impression. Blending and mutual repelling of the wet applied colors on the paper web is thus rendered impossible. Also, the printing on one side dried and thus prevented from dabbing on the next impression cylinder during immediately subsequent printing on the reverse side of the web, and the printed impressions are prevented from smearing during passage of the printed web through subsequent paper guiding and folding devices.

The invention will be better understood by reference to the following detailed description in connection with the accompanying drawing showing by way of example and purely diagrammatically a multi-color offset web fed roto-gravure printing press having the invention applied thereto.

Referring to the drawing, it will be seen that the web 2 of paper, cloth, or any other material is passed to the first impression cylinder 5 through a per se known tensioning device 3 and guide rollers 4. The impression cylinder 5 cooperates with two rubber offset cylinders 6 and 7 with each of which is associated a plate cylinder 8 and 9, respectively, having corresponding inking and dampening devices 20, 21 and 22, 23, respectively. It is well understood that the inks conventionally used for offset printing are substantially higher boiling or less volatile

than some letterpress inks, and are not susceptible to quick rapid flash drying at temperatures sufficiently low as not to damage the paper. Arranged over the surface of the impression cylinder and between the rubber offset cylinders 6 and 7 are hoods 10 and 11, said hoods being located over the circumferential surface of the impression cylinder 5 so as to cover the printed surface of web 2 for a substantial time following each of the printing impressions received thereon from cylinders 6 and 7, cylinder 5 being of the order of four times as large as cylinder 6 or 7 as shown in the drawing. Hoods 10 and 11 are constructed as drying devices adapted to such a substantial part of the circumference of the impression cylinder, or the printed impressions on the web covering that sector of the impression cylinder 5 to a drying action of sufficient intensity and duration to effect drying of the printed impression prior to contact with the next printing station or rubber offset cylinder. In this way sufficient time and path of travel is provided over the extended surface of the impression cylinder to dry the higher boiling offset type of ink at a temperature below that which would damage the paper.

On leaving the impression cylinder 5 the web 2 is passed over guide rollers 12 to the next impression cylinder 13 on which, for instance, printing on reverse side of web 2 is achieved at the two printing stations associated with impression cylinder 12 (including two rubber cylinders 14 and 15 and plate cylinders 16 and 17, respectively, together with the associated inking and dampening devices 24, 25, and 26, 27, respectively). Here again, associated with impression cylinder 13, are drying hoods 18 and 19 arranged to subject the impressions on web 2 to drying following each rubber cylinder 14 or 15.

The web may then be further handled in any desired manner. Thus, one or more additional impression cylinders may follow, for instance, if the printing on web 2 is to include more than two colors. Also the web may be passed directly to conventional cutting and folding apparatus (not shown), or a wind-up device of conventional construction (not shown) may follow. Of course, the printing on the first side of web 2 may be accomplished with more than two colors, by including an additional impression cylinder with not more than two printing stations and associated drying hoods, and/or providing suitable means for turning the web by per se known turning bars between the first and the second impression cylinders for printing additional impressions on either side.

It will be understood that the construction of the printing press according to the present invention not only has the advantage of a simple and clear arrangement of the machine in the so-called tandem arrangement, but it also ensures accurate register and ready and convenient accessibility of the inking units.

Hence it is not necessary to arrange the inking devices so as to be removable.

While the invention has been described in detail with respect to a now preferred example and embodiment of the invention it will be understood by those skilled in the art after understanding the invention that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended, therefore, to cover all such changes and modifications in the appended claims.

What is claimed is:

1. In a multicolor web fed offset rotary printing press of the character described having a plurality of offset printing stations adapted to supply sequential impressions of high boiling offset inks to a web of paper, the combination which comprises an impression cylinder for each two of said offset printing stations, an offset roll at each of said printing stations for transferring an impression of said high boiling offset ink to said paper web against said

impression cylinder, said ink impression requiring a predetermined substantial time for the drying thereof at a temperature less than that which will damage said paper web, means for mounting two of said printing station offset rolls adjacent said impression cylinder at substantially diametrically opposite sides thereof for sequential printing contact with paper on said cylinder, the circumferential extent of said impression cylinder between said two offset rolls being substantially twice the circumference of said rolls, a pair of arcuate hoods between said printing stations and overlying substantially the entire portions of the surface of said impression cylinder between said offset rolls, and means for supplying a drying medium through said hoods to the surface of said paper on said impression cylinder for drying each ink impression applied thereto at a temperature less than will damage said paper web and prior to the application to said paper of a subsequent ink impression at a subsequent offset roll.

2. In a multicolor offset rotary printing press of the character described having a plurality of printing stations for applying sequential impressions of offset high boiling ink to a paper web, the combination which comprises an impression cylinder for each two of said printing stations, an offset roll in each of said printing stations for transferring an impression of said offset ink to said paper web against said impression cylinder, said ink impression requiring a substantial time for drying at a temperature less than will damage said paper web and the diameter of said impression cylinder being approximately four times that of each said offset roll providing said substantial drying time for each said ink impression, means for mounting said offset rolls adjacent said impression cylinder at substantially diametrically opposite sides thereof for sequential printing contact with paper on said impression cylinder, and means overlying substantially the entire surface portions of said impression cylinder between said offset rolls for drying said ink impression applied to the paper at a temperature less than will damage said paper prior to the application of a subsequent ink impression by a subsequent offset roll.

3. In a multicolor offset rotary printing press having an impression cylinder and a plurality of offset printing stations each including an offset roll for applying sequential impressions of offset ink to a paper web against said impression cylinder, saif offset ink impressions requiring a substantial time and length of travel for drying at a temperature less than will damage said paper web, the combination which comprises means for mounting not more than two of said printing stations associated with said impression cylinder, said stations being mounted at diametrically opposite sides of said cylinder for sequential printing contact with said paper and the diameter of said impression cylinder being approximately four times the diameter of said offset rolls providing said substantial drying time for each ink impression between sequential said printing stations, a pair of circumferentially extending hoods overlying substantially the entire surface portions of said impression cylinder between said printing stations, and means for supplying drying medium through said hoods to the surface of said paper web throughout its travel between said printing stations for drying each said ink impression on said paper at a temperature less than will damage said paper and prior to a subsequent ink impression at a subsequent said printing station.

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