

July 12, 1927.

O. WOHLRABE

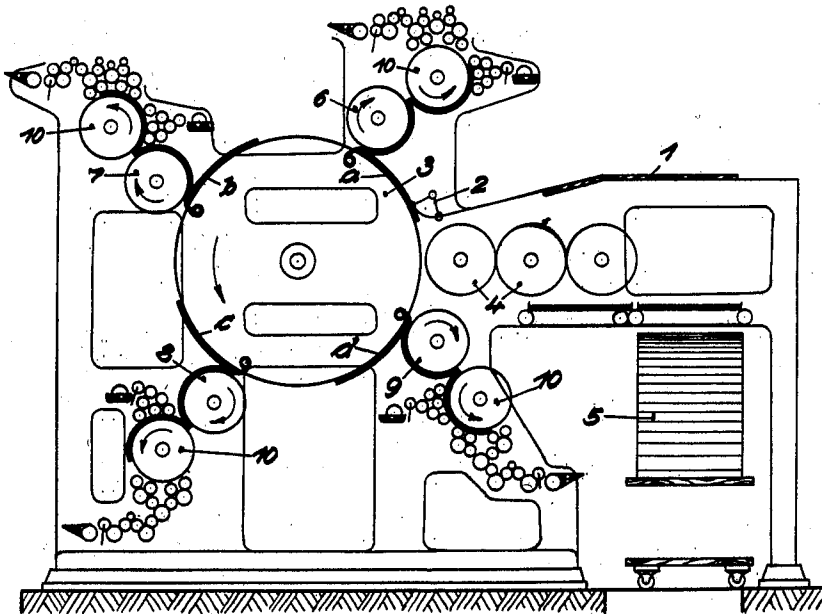
1,635,299

MULTICOLOR ROTARY OFFSET PRINTING PRESS

Filed Oct. 19, 1926

2 Sheets-Sheet 1

Fig. 1



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MULTICOLOR ROTARY OFFSET PRINTING PRESS

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2 Sheets-Sheet 2

Fig. 2

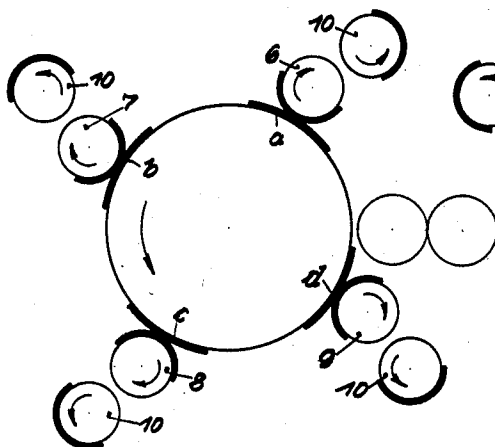


Fig.3

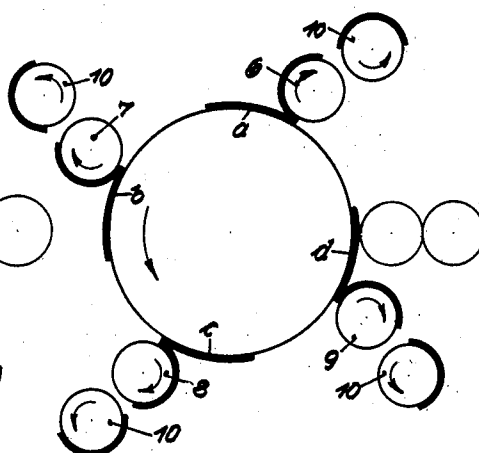


Fig.4

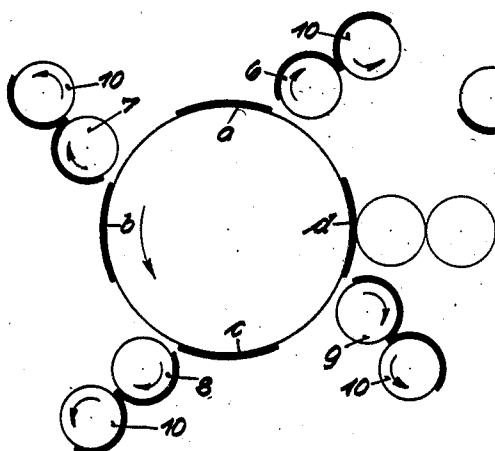
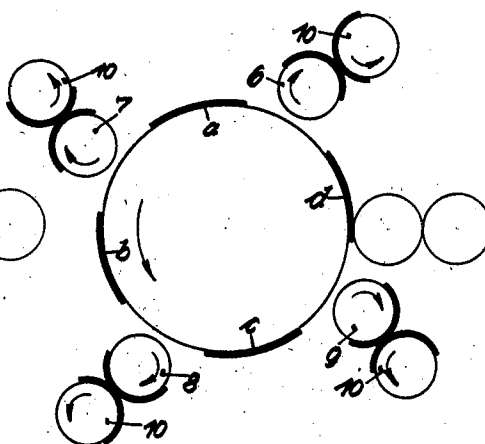


Fig. 5



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UNITED STATES PATENT OFFICE.

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MULTICOLOR ROTARY OFFSET-PRINTING PRESS.

Application filed October 19, 1926, Serial No. 142,629, and in Germany May 11, 1925.

This invention relates to a multi-color rotary offset printing press having several offset and plate cylinders arranged around a common impression cylinder and is intended to avoid the shocks experienced by the offset cylinders to the impression cylinder on the initiation of each printing stage of said impression cylinder and causing a rubbing of the offset cylinders on the plate cylinders and damaging the printing plates.

With a view to obviating these defects and enabling a uniform impression to be obtained the offset cylinders are arranged symmetrically in equal distances from one another around said common impression cylinder in such a manner that the shocks simultaneously experienced by all offset cylinders to impression cylinder balance one another.

In order that the principle thereof may be readily understood I have disposed a single embodiment thereof by way of example in the accompanying drawings, wherein

Fig. 1 shows a lateral view of a multi-color rotary sheet printing press embodying the invention and

Figures 2 to 5 represent different working positions of the individual cylinder sets.

The sheets to be printed are carried from a feeding table 1 by grippers 2 to the sheet bearers provided with grippers on the impression cylinder 3 and after one revolution thereof are conveyed to the delivery cylinders 4 whence they are delivered in a known manner to the sheet pile 5.

Grouped about the impression cylinder 3 in the example shown, are four offset cylinders 6, 7, 8, 9 each co-operating with a plate cylinder 10, but the numbers of these offset cylinders may, of course, vary. Each of the latter is equipped in a known manner with an inking and damping device.

The diameter of the impression cylinder 3 is, in the example shown, four times that of each offset cylinder 6, 7, 8, 9 and of each plate cylinder 10. The four sheet bearers *a b c d* on the impression cylinder 3 serving as supports for the sheets to be printed are of such dimensions that the intervals between them are wider than the adjacent bearers. The circumference of the impression cylinder must obviously therefore be equal to a multiple of the circumference of one offset or plate cylinder in order that the offset cylinders may in a correct manner

roll off on the bearers *a b c d* and thereby enable a clean impression of the picture taken from the printing plate to be realized.

The offset and plate cylinders 6 to 10 are as usual covered with offset blankets and printing plates respectively over a part only of their circumference which, however, is smaller than half of their total circumference so that the development of the offset aprons and printing plates corresponds with the width of the bearers *a b c d*. The effect of this is that the impression of the offset aprons on the sheets which are placed on the bearers *a b c d* of the impression cylinder 3 commences according to Fig. 1 only when the contact between the offset blanket on each offset cylinder 6 to 9 on the one hand and of the printing plate of the corresponding plate cylinder 10 on the other hand is interrupted or has already been interrupted. During the operation of the offset cylinders 6 to 9 on the paper sheets according to Fig. 2 the contact between the offset and plate cylinders is interrupted. This is still the case in Fig. 3 when the printing of the offset cylinders on the paper sheets is finished. During the action of the plate cylinders 10 on the corresponding offset cylinders 6 to 9 (see Figs. 4 and 5) no contact takes place between the offset cylinders and the common impression cylinder 3. Consequently shocks imparted to the offset cylinders 6 to 9 from the impression cylinder 3 cannot be transmitted to the printing plates to the detriment of the latter, while conversely none of the shocks experienced by the plate cylinders at each fresh printing stage are transmitted to any vital part.

The invention offers particular advantages where the arcuate distance between the contact points of each two adjacent offset cylinders with the impression cylinder corresponds to a complete development of the offset cylinder or a multiple thereof. In this case and due to the uniform commencement of printing by all the offset cylinders shocks in the impression cylinder 3 and consequently an unfavourable reaction on the individual offset cylinders 6 to 9 are almost completely avoided. The most favourable printing results are obtainable however only if the plate and offset cylinders are equipped in the manner above described, the plate cylinders are distributed so that their printing stages commence uniformly and, in addition,

the offset cylinders are so distributed around the impression cylinder as to cause the shocks exerted on the impression cylinder at each fresh printing stage of the offset cylinders mutually to balance one another. Therefore if only two offset cylinders co-operate with the impression cylinder they should preferably be offset to one another at 180°. Three offset cylinders must correspondingly be offset at angles of 120° about the impression cylinder and so on. The impression cylinders of said cylinders and plate cylinders are arranged relative to one another so that the lines drawn from the center of each of said offset cylinders to that of said impression cylinders on the one hand and to that of the corresponding plate cylinders on the other hand enclose an angle which is equal to or greater than the angle subtended by said offset blankets fitted on said offset cylinders. The number of impression bearers on the impression cylinder in each case preferably corresponds to the number of offset cylinders. In this way the printing process remains unaffected by any injurious transverse movements or shocks of individual cylinders thereby enabling the press to be operated not only at very high speed but also uniformly good printing results to be realized.

Having thus described one illustrative embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation. Changes and variations may be made in the construction by which the invention claimed is carried into effect without departing from the spirit or scope of the invention.

Having thus described the invention what is claimed as new is:

1. A multi-color rotary offset printing press consisting of an impression cylinder with several printing sections, several offset cylinders covered with offset blankets and being arranged symmetrically in equal distances from one another around said common impression cylinder, several plate cylinders covered with printing plates, each of them co-operating with one of said offset

cylinders, inking and damping devices arranged to cooperate with said plate cylinders and feeding and delivery appliances co-operating with said impression cylinder.

2. A multi-color rotary offset printing press consisting of an impression cylinder with several printing sections, several offset cylinders covered with offset blankets, the arcuate distance between the points of contact of said offset cylinders on the one hand and said impression cylinder on the other hand corresponding to a complete development of said offset cylinder or a multiple thereof, several plate cylinders covered with printing plates, each of them co-operating with one of said offset cylinders, inking and damping devices arranged to cooperate with said plate cylinders and feeding and delivery appliances co-operating with said impression cylinder.

3. A multi-color rotary offset printing press consisting of an impression cylinder with several printing sections, several offset cylinders covered with offset blankets, the arcuate distance between the points of contact of said offset cylinders on the one hand and said impression cylinder on the other hand corresponding to a complete development of said offset cylinder or a multiple thereof, several plate cylinders covered with printing plates, each of them co-operating with one of said offset cylinders, inking and damping devices arranged to cooperate with said plate cylinders and feeding and delivery appliances co-operating with said impression cylinder, said offset blankets and printing plates respectively covering said offset and plate cylinders over an arc of less than 180° and said impression-, offset- and plate cylinders being so arranged relatively to one another that lines drawn from the centre of each of said offset cylinders to that of said impression cylinder on the one hand and to that of said corresponding plate cylinders on the other enclose an angle which is equal to or greater than that angle subtended by said offset blankets fitted on said offset cylinders.

In testimony whereof I affix my signature.

OTTO WOHLRABE.