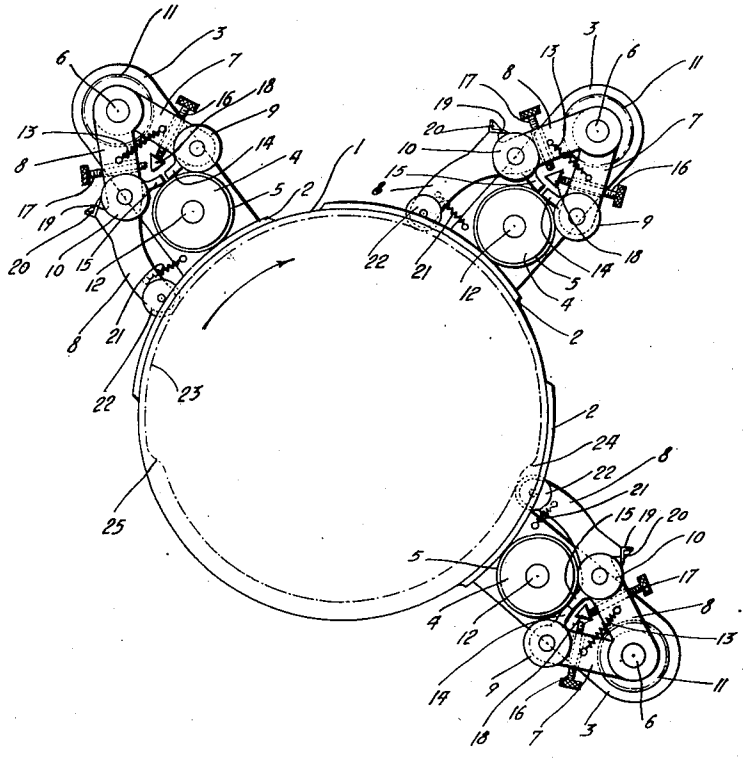
June 6, 1950 L. G. DUBUIT 2,510,388

METHOD AND MEANS FOR THE POLYCHROME OFFSET PRINTING

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Fig. 1



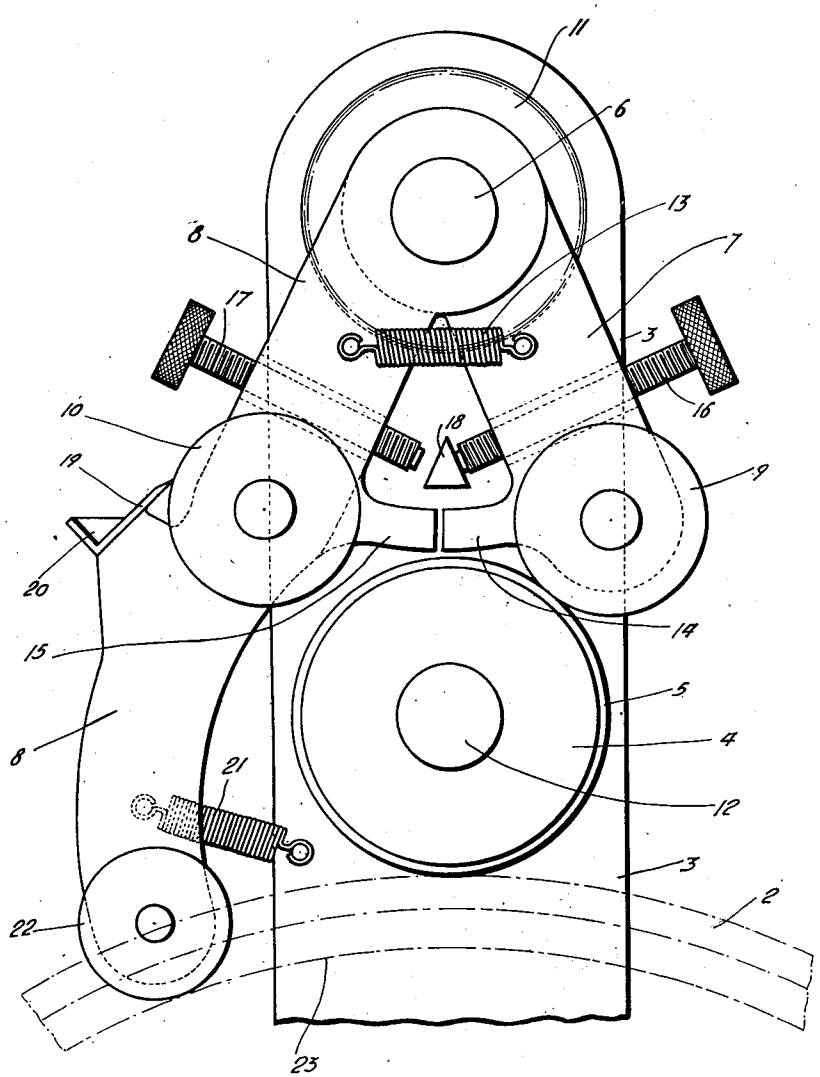
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METHOD AND MEANS FOR THE POLYCHROME OFFSET PRINTING

Filed Jan. 20, 1947 2 Sheets-Sheet 2

Fig. 2



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Patented June 6, 1950 2,510,388

UNITED STATES PATENT OFFICE

2,510,388

METHOD AND MEANS FOR THE POLYCHROME OFFSET PRINTING

Louis Gilbert Dubuit, Paris, France

Application January 20, 1947, Serial No. 723,021
In France May 25, 1946

10 Claims. (Cl. 101—425)

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The polychrome off-set printing including the successive transfer of a plurality of monochrome plates on a same blanket as executed heretofor sets a difficult problem as concerns the nature and the grade of the ink to be used. As a matter of fact, if the inks of various colors which are to be used for printing are all of the same kind and of the same viscosity, there is produced on the blanket during the execution of the machines to be printed mixtures between the colors which blend together so that it is necessary to speedily stop the operation in order to clean the blanket and the plates. In order to avoid this drawback one is led to use for each color ink the nature and the viscosity of which are sufficiently different from those of the inks of the other colors for such mixings of the colors to become impossible; this leads to a considerable complication and restricts substantially the field of application of the printing method considered.

My invention has for its object a method which allows removing the above drawbacks whereby it is possible to use for polychrome off-set printing, printing inks of any type without it being necessary to take into account their nature or their relative viscosities. My improved method consists chiefly in eliminating from each plate after each transfer operation of said plate on to the blanket and before any further inking of said plate the ink which is still adherent to the latter after the transfer operation.

It has been found as a matter of fact, that such a cleaning of the plate between the successive transfers is sufficient to prevent any objectionable mixing between the colors. This cleaning may be executed by means of a roller of rubber or the like material similar to the rollers in current use for inking the plates, said rollers being merely moved over the plate after the transfer operation, while the inking roller or rollers are held away from said plate. The ink which still adheres to the latter is then collected by the roller from which it may be removed for instance by a scraper.

The method according to my invention is of particular advantage in rotary machines of a type known per se which are adapted for the off-set printing on cylindrical and the like objects, for instance, such as tubes.

In this case, the plates and the blankets are wound respectively over corresponding cylinders, the blankets rolling in contact with all the plates in succession. The arrangement for executing the invention may then include for each monochrome plate a rocking support pivotally secured

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to the frame of the machine to be printed and carrying on one hand an inking roller and on the other hand, a cleaning roller. The rocking of said support bring alternatingly the two rollers into contact with the plate considered, said support cooperating with a cam rigid with the cylinder carrying the blanket and producing the rocking of said support during the passage of the plate in contact with blankets and during a fraction of the rotation of the blanket carrying cylinder preceding said passage; this rocking is performed in the direction bringing the inking roller into contact with the plate and it is again provided during the remainder of the rotation of the cylinder considered in the opposite direction which brings the cleaning roller into contact with the plate, a return spring connecting the rocking support with the frame of the machine and urging said support into contact with the cam.

It is of advantage to proceed with the adjustment of the pressure urging the rollers against the plate at least as concerns the inking roller. To this purpose, the latter roller or the two rollers used for inking and cleaning may be mounted for instance, in an adjustable manner on their rocking support. It is however preferable to use a support made of two independent parts, say two arms which are advantageously pivotally secured to a common shaft and which are connected through a spring or the like elastic means urging them towards one another while at least one adjusting screw is provided for limiting the stroke of either of the arms carrying the inking roller of both the arms forming the roller supports. In the case of a single screw, the latter may be rigid with the arms carrying the inking roller and cooperate with a stop carried by the arm carrying the cleaning roller or reversely. In the case of two adjusting screws, the latter are preferably carried each by the corresponding arm and cooperate with a stationary stop carried by the frame of the machine, projections carried by each arm cooperating with one another for providing a minimum spacing between the latter, which spacing should be sufficiently large for the two rollers to be incapable of coming simultaneously into contact with the plate; the arrangement of two adjusting screws allows a modification as desired of the pressures exerted on the plate by each of the inking and cleaning rollers.

The rocking support carries preferably a scraper adapted to cooperate with the cleaning roller, said member being for instance constituted

by a mere blade carrying a bucket adapted to receive the ink removed from the roller considered.

I have shown diagrammatically in accompanying drawings a form of execution of an arrangement according to my invention as applied to a rotary machine for three color off-set printing on objects such as tubes, for instance of carboard or aluminium.

In said drawings:

Fig. 1 is a general diagrammatic view showing the mounting of several arrangements according to my invention on a printing machine.

Fig. 2 is a diagrammatical view at a larger scale of a single arrangement according to my invention.

The printing machine (Fig. 1) comprises as known per se a rotary cylinder 1 to a portion of the periphery of which is secured in the usual known manner a blanket 2 for the transfer of the impression. The cylinder 1 is mounted in the usual manner on a frame which is not illustrated and which includes radial supports 3, carrying in corresponding bearings each a cylinder 4 carrying a printing plate 5 corresponding to one of the colors of the three-chrome printing.

To a shaft 6, rigid with each radial support 3 are pivotally secured two independent arms 7 and 8. The arm 7 carries an inking roller 9 of rubber of a type known per se, while the arm 8 carries a cleaning roller 10 similar to the roller 9.

The plate carrying cylinder 4 is adapted to rotate in a manner known per se, under the action of a gear cooperating with a toothed wheel rigid with the cylinder 1. The roller 9 is mounted loose while the roller 10 is adapted to rotate at a peripheral speed which is equal to that of the plate 5 under the action of a gearwork carried by the arm 8 and including a toothed wheel 11 receiving its movement from the shaft 12 of the cylinder 1 also through the agency of a gearwork. The system of transmission members which has just been mentioned has not been illustrated in the drawings in order to not overcrowd the latter, but their mounting shows no particular difficulty and is within the scope of any mechanic.

The members for bringing ink to and distributing it over the roller 10 and the members adapted to hold the objects which are to receive the impression and to bring them into contact with the transfer roller, differ by no means from the similar members already used in similar machines in current use and they have therefore not been illustrated.

The arms 7 and 8 are permanently urged towards one another by a return spring 13 and carry respectively projections 14 and 15 facing one another, said projections having a length such that when they are in contacting relationship they provide between the rollers 9 and 10 a sufficiently large spacing for said rollers not to be capable of coming simultaneously into contact with the plate 5. These arms carry also adjusting screws shown respectively at 16 and 17 and cooperating each with one side of a common abutment 18 rigid with the corresponding support 3.

The arm 8 is provided with a scraper 19, the edge of which bears against the surface of the cleaning roller 10, said scraper carrying a bucket or recess 20 adapted to receive the ink scraped off the roller 10. For sake of simplicity said scraper has been illustrated as stationary but it may be pivotally secured to its support and urged by a spring against the surface of the roller 10.

This same arm 8 which is urged towards the support 3 by a spring 21 carries at its free end a roller 22 cooperating with a cam 23 rigid with the cylinder 1 and cooperating with all the similar rollers 22 of all the inking and cleaning arrangements distributed over the periphery of said cylinder 1. The outline of this cam is such that for each arrangement, the cleaning roller 10 is moved away from the plate 5 against the action of the spring 21 during the passage of said plate over the blanket 2 and during the period preceding said passage which corresponds to about two revolutions of the cylinder 4 while during the remainder of the rotation of the cylinder 1 said roller 10 is submitted unrestrictedly to the return action of the spring 21.

The description of the operation of the machine given hereinafter corresponds only to the existence of a single plate carrying arrangement, the operation being the same for all these arrangements.

The cylinder 1 carrying the blanket 2 is set rotating through the usual means in a direction given out by the arrow, and the plate 5 carried by the cylinder 4 starts also rotating together with the rollers 9 and 10. When the cam 23 engages the roller 22 at the point 24 (Fig. 1), the arm 8 is urged to rock against the action of the spring 21 and the roller 10 is moved away from the plate 5. The movement of the arm 7 being associated with that of the arm 8 by the spring 13, said arm 7 is caused to rotate clockwise until the adjusting screw 16 abuts against the stop 18. The screw 16 is previously adjusted so that under said conditions the roller 9 may bear against the plate with the pressure required for the correct inking of the latter. The plate 5, is then filled with ink of the required color, and when its passes over the blanket 2 is transferred on to the latter.

The cylinder 1 prosecuting its rotation, the cam 23 leaves the roller 22 at a point 25. The spring 21 urges then the arm 8 into contact with the cylinder. The projection 15 comes into contact with the projection 14 and urges it back so that the roller 9 is moved away from the plate 5, while the roller 10 bears against the latter, the screw 17 being adjusted to this purpose. During the contact between the plate 5 and the roller 10, the latter collects the ink covering said plate, said ink being removed from the roller 10 as it rotates by the scraper 19. The roller 22 is then reengaged by the cam 23 and the operation begins over again.

At each revolution of the cylinder 1, the different plates are thus transferred on to the blanket, which is caused subsequently to move over the objects to be printed which assume, in a manner well known per se, a corresponding rotary movement, said object receiving then the impression transferred on to the blanket.

What I claim is:

1. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of a support, a stationary pivot to which said support is rockingly secured, an inking roller and a cleaning roller carried by said support and means whereby the rocking of the support brings in alternation the two rollers into contact with the plate, a cam rigid with the blanket carrying cylinder, and adapted to provide the rocking of

the support during the passage of the plate over the blanket and during a fraction of the rotation of the blanket carrying cylinder preceding said passage in a direction bringing one roller into contact with the plate and a spring connected with the rocking support and urging said support against the cam and blanket carrying cylinder for rocking the support in the opposite direction with reference to the plate carrying cylinder and bringing the other roller into contact with the plate.

2. In an arrangement for offset polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of a support, a stationary pivot to which said support is rockingly secured, an inking roller and a cleaning roller carried by said support, means for adjusting the pressure applied by at least the inking roller on the plate and means whereby the rocking of the support brings in alternation the two rollers into contact with the plate, a cam rigid with the blanket carrying cylinder, and adapted to provide the rocking of the support during the passage of the plate over the blanket and during a fraction of the rotation of the blanket carrying cylinder preceding said passage in a direction bringing one roller into contact with the plate and a spring connected with the rocking support and urging said support against the cam and blanket carrying cylinder for rocking the support in the opposite direction with reference to the plate carrying cylinder and bringing the other roller into contact with the plate.

3. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of two members, a stationary pivot for same, a spring urging said members towards one another, means for limiting the movement of the members towards one another, an inking roller and a cleaning roller carried respectively by each of the two members, a cam rigid with the blanket carrying cylinder and cooperating with one member for urging one of the inking and cleaning rollers away from the plate carrying cylinder and yieldingly engaging the other roller into contact therewith and yielding means urging the cam follower against the cam and blanket carrying cylinder surface beyond the cam and thereby urging the first cylinder into contact with and the second cylinder out of contact with the plate carrying cylinder.

4. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of two members, a stationary pivot for same, a spring urging said members towards one another, an adjusting screw cooperating with at least one member, an abutment on the other member against which said screw is adapted to bear an inking roller and a cleaning roller carried respectively by each of the two members, a cam rigid with the blanket carrying cylinder and cooperating with one member for urging one of the inking and cleaning rollers away from the plate

carrying cylinder and yieldingly engaging the other roller into contact therewith and yielding means urging the cam follower against the cam and blanket carrying cylinder surface beyond the cam and thereby urging the first cylinder into contact with and the second cylinder out of contact with the plate carrying cylinder.

5. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of two members, a stationary pivot for same, a spring urging said members towards one another, two adjusting screws carried by the corresponding members, a stationary stop cooperating with both screws projections facing one another on the two members and adapted to meet for preventing the spacing between said parts from falling underneath a predetermined value, an inking roller and a cleaning roller carried respectively by each of the two members, a cam rigid with the blanket carrying cylinder and cooperating with one member for urging one of the inking and cleaning rollers away from the plate carrying cylinder and yieldingly engaging the other roller into contact therewith and yielding means urging the cam follower against the cam and blanket carrying cylinder surface beyond the cam and thereby urging the first cylinder into contact with and the second cylinder out of contact with the plate carrying cylinder.

6. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of a support, a stationary pivot to which said support is rockingly secured, an inking roller and a cleaning roller carried by said support and means whereby the rocking of the support brings in alternation the two rollers into contact with the plate, a cam rigid with a blanket carrying cylinder, and adapted to provide the rocking of the support during the passage of the plate over the blanket and during a fraction of the rotation of the blanket carrying cylinder preceding said passage in a direction bringing one roller into contact with the plate, and a spring connected with the rocking support and urging said support against the cam and the blanket carrying cylinder for rocking the support in the opposite direction with reference to the plate carrying cylinder and bringing the other roller into contact with the plate, and a scraper cooperating with the cleaning roller for removing the ink therefrom.

7. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of two members, a stationary pivot for same, a spring urging said members towards one another, means for limiting the movement of the members towards one another, an inking roller and a cleaning roller carried respectively by each of the two members, a cam rigid with the blanket carrying cylinder and cooperating with one member for urging one of the inking and cleaning rollers away from the plate carrying cylinder and yieldingly engaging the other roller into contact therewith and yielding means urging the cam fol-

lower against the cam and blanket carrying surface beyond the cam and thereby urging the first cylinder into contact with the second cylinder out of contact with the plate carrying cylinder, a scraping blade yieldingly carried by the same member as the cleaning roller and adapted to cooperate therewith and means rigid with said blade for collecting the ink removed by said blade from said cleaning roller.

8. In an arrangement for off-set polychrome printing applicable to rotary machines including a cylinder for the blanket and a plurality of cylinders for the plates to be inked in different colors and transferred on to the blanket, the combination with each monochrome plate carrying cylinder of a support, a stationary pivot to which said support is rockingly secured, an inking roller and a cleaning roller carried by said support and means whereby the rocking of the support brings in alternation the two rollers into contact with the plate, a cam rigid with the blanket carrying cylinder, a cam follower carried by the rocking support for cooperation with said cam, and adapted to provide the rocking of the support during the passage of the plate over the blanket and during a fraction of the rotation of the blanket carrying cylinder preceding said passage in a direction bringing one roller into contact with the plate and a spring connected with the rocking support and urging said support against the cam and blanket carrying cylinder for rocking the support in the opposite direction with reference to the plate carrying cylinder and bringing the other roller into contact with the plate.

9. In a polychrome off-set printing method including the successive transfer of a plurality of monochrome plates on a single blanket; the steps of removing the plates from the blanket after each transfer operation, removing the inking cylinder from each plate when the latter is removed from the blanket and removing the ink from the plate by passing the entire surface of the plate at least twice in contact with a yielding roller of the plate inking type, and reinking said plate anew in contact with the blanket.

10. In a polychrome off-set printing method including the successive transfer of a plurality of monochrome plates on a single blanket, in which a plurality of blankets are mounted on the same blanket cylinder; the steps of removing the plates from the blankets after each plate has contacted all of the blankets, removing the inking cylinder from each plate when the latter is removed from the blankets and removing the ink from each plate by passing the entire surface of said plate at least twice in contact with a yielding roller of the plate inking type, and reinking said plate anew in contact with the first blanket.

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