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SINGLE IMPRESSION MULTICOLOR OFFSET PRINTING PRESS

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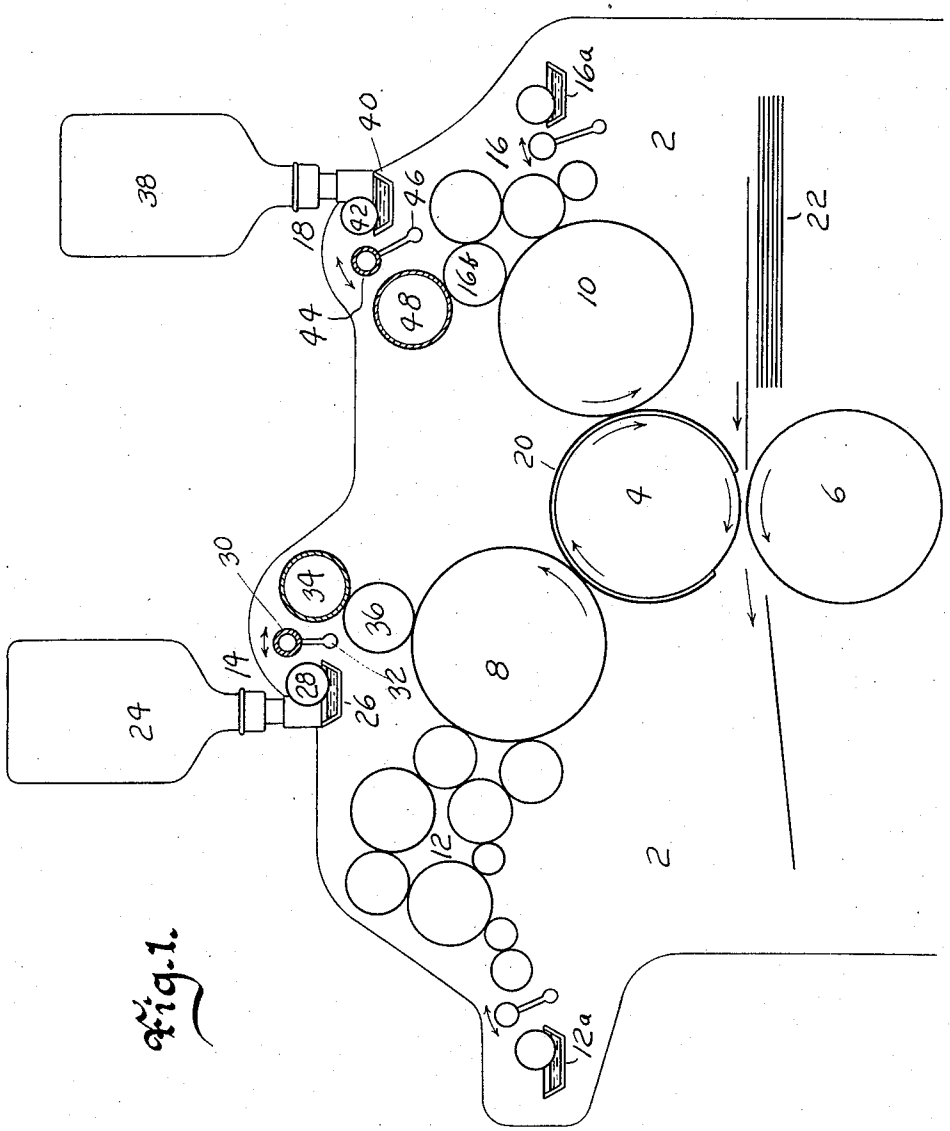


Fig. 1.

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SINGLE IMPRESSION MULTICOLOR OFFSET PRINTING PRESS

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5 Claims. (Cl. 101—175)

This invention is a single impression multi-color offset paper printing press. The press features structure for introducing the repellant into the ink supply. This structure includes a cloth covered or molleton roller in contact with the ink rollers of the machine. The device features in combination with the means of putting repellant into the ink supply a pair of plate cylinders geared to the blanket cylinder whereby two separate impressions may be transferred to the blanket and both of these transferred to the paper being printed with a single impression.

It has been proposed before now to print more than one color with a single impression on an offset press. In actual practice before my invention, however, it has been found to be possible to do so only on hard materials such as metal and the like. The reason for this appears to be that using conventional repellant introducing means of the type that placed the repellant directly on the plate cause the blanket to become damp after contacting the first plate with the result that the ink from the second plate would not transfer well to the blanket. Contrarily if the ink and blanket were dry enough from the transfer of ink from the first plate to the blanket to permit the ink from the second plate to be transferred well, the ink first transferred was too dry to transfer to the paper well. In fact in order to get the ink to transfer, pressures greatly in excess of normal printing pressures were found to be necessary. With excessive pressures on paper, however, distortion occurred which made such printing on paper impractical. When lithographing metal as for cans or the like, these excessive pressures do not distort the material on which the printing is done and are not detrimental. As for printing on paper, however, the prior art has not been successful in printing more than one color with a single impression. At least this is true of presses intended for operation by relatively unskilled personnel. In any case to the best of my knowledge and belief, this multi-color, single impression printing is now done only on metal with the exception of my invention.

Accordingly it is the main object of my invention to provide a press for printing more than one color with a single impression on paper by the offset printing method; a press that:

(1) Makes clear precise prints on paper.

(2) Uses normal printing pressures for the offset method.

(3) Maintains a dry blanket during the printing process.

(4) Can be used successfully by persons of minimum skill.

(5) Uses a repellant system that is less sensitive so as to be easily controlled to introduce the proper quantities of repellant.

While the foregoing specifically listed objects are the main ones of this invention, it is my intention to include

as objects hereof any such as may be apparent to one skilled in the offset printing art after he has read this specification and examined the accompanying drawing which is briefly described as follows:

Fig. 1 is a schematic side elevation of my novel printing press in so far as it is pertinent to my invention shown on an outline of the frame.

Referring to the drawing, the invention is seen to have a frame **2** on which are journalled: a blanket cylinder **4**, an impression cylinder **6**, a first plate cylinder **8**, a second plate cylinder **10**, a conventional inking system **12** for said first plate cylinder, a repellant system **14** for said first plate cylinder, a conventional inking system **16** for said second plate cylinder, and a repellant system **18** for said second plate cylinder. The blanket cylinder **4** carries the usual impression transferring blanket **20** which when rolled against the impression cylinder, provides the usual printing pressure for conventional offset presses. Paper **22** is fed into the press at the proper time by a conventional paper feed, and the entire press is driven by a suitable conventional power source.

The repellant systems for the two plates are similar to each other without being the same. Also much of the structure of these repellant systems is conventional with the novelty of them residing in the arrangement of the parts rather than in the individual parts used. In system **14**, for example, there is a conventional reservoir **24** that supplies repellant liquid of a conventional type to a conventional repellant fountain **26**. A conventional fountain roller **28** is journalled to the frame **2** and extends down into the fountain. Fountain roll **28** is conventionally controlled as to the amount of rotation it has in relation to the other parts of the press. The usual cloth covered ductor roll **30** is mounted on a pair of arms such as the one **32** which is pivoted to frame **2**. The other well known and, therefore, not illustrated linkage of the press causes the arm to pivot in timed relation to the other parts of the press as shown by the double headed arrow in Fig. 1. Ductor roll **30** contacts fountain roll and the large cloth covered or molleton roll **34** intermittently, and by this means transfers repellant liquid from the fountain roll to the roll **34**. In the usual repellant system of this type, the molleton roll **34** contacts the plate on plate cylinder **8**, and the position here occupied by the roll **34** is a hard transfer roll. Molleton roll **34** is also in contact with roller **36** which at first glance appears to be part of the repellant system. In fact, however, the roll **36** is an inking roll. It gathers excess ink from the plate on plate cylinder **8** when the press is in operation and transfers this ink back to the plate if the plate will take it. It is one of the cylinders or rollers of the inking system and actually carries a portion of the conditioned ink supply for the plate cylinder **8**. As shown by the arrow in plate cylinder **8**, it rotates as to bring any given portion of it that has deposited ink on blanket cylinder **4** into contact with roller **36** before contacting any of the other rolls in contact with plate cylinder **8**. Since the roller does not contact any of the other rollers of the inking system **12**, however, the repellant is said to be introduced into the inking system indirectly as compared to the system **16—18** wherein the repellant is introduced directly into the main inking system as will now be explained.

The repellant system **18** for the second plate cylinder also has a conventional reservoir **38** that feeds some standard repellant liquid to the fountain **40**. Journalled to the frame **2** in the fountain **40** is a fountain roller **42** which is also controlled as to rotation in a conventional manner. Ductor roll **44** is like ductor roll **30** and is

mounted on arms like the one **46**. The double headed arrow indicates alternate contact of the ductor roller **44** to the fountain roller **42** and the molleton or cloth covered roller **48**. Roll **48** is identical to roll **34** and contacts the ink roller **16***b* of the system **16**. It will be noted that the roller **16***b* contacts other rollers of the inking system **16** as well as the plate cylinder **10**. At the same time, the direction of rotation of plate cylinder **10** is such as to bring any given portion of it that has deposited ink on the blanket cylinder **4** into contact with ink roll **16***b* only after it has contacted the other ink roll of inking system **16**. In this respect the two repellant systems are different from each other, and system **18** may be referred to hereinafter as a direct system of introducing repellant. The repellant systems are both controlled as to the amount of repellant they introduce by controlling the amount of rotation of the fountain rollers. This controlling structure is conventional and is, therefore, neither described or shown. Whatever the control used, however, it should be adequate to permit several times the amount of repellant introduced by one system to be introduced by the other.

The two plate cylinders are geared to the blanket cylinder and driven whenever the blanket cylinder is. For this reason, once the cylinders are properly adjusted to the blanket cylinder, the printing must necessarily be in proper register if the plates themselves are properly made.

Another factor that may be responsible in part for the success of this multi-color offset printing system is the use of flat or ungrained plates. The conventional grained plates collected moisture in the grain. It would be much more difficult to maintain a dry blanket using the grained plates. As the maintaining of a dry blanket is essential to the proper operation of this printing method, it may well be that the now well known ungrained plates are essential to the operation of this unit.

The results obtained from the combination and arrangement of parts described herein are excellent. Also for some reason unknown to me, the adjustment of the repellant system is much less critical than is true of conventional repellant systems that apply repellant directly to the plate. There are other repellant introducing systems for placing repellent into the ink, but of those known to me many introduce the repellant into the inking system at a point that is rather remote from the rollers that contact the plate. I do know that when the repellant is inserted into the inking system near to the latter's contact with the plate that the results are excellent. From at least my knowledge of one other device that introduces repellant into the inking system at a remote point relative to the plate, I can say that such a procedure does not produce as satisfactory results as does the structure described and shown herein.

As was stated above, the repellant system **14** was constructed by eliminating one of the rollers of the conventional repellant system; moving roller **34** to the position occupied by the removed roller and inserting a conventional ink roller **36** at the point formerly occupied by roller **34**. Not only does this provide an excellent repellant introducing system but also adds a roller to the conditioned ink capacity of the inking system without increasing the total number of rollers used. Obviously the conventional system used on a large number of existing presses is easily converted to my novel and improved system.

I have disclosed my invention by both describing it and also by showing in connection with the description the preferred practical embodiment of it. I now point out with particularity the structure for multi-color offset printing with a single impression in the following claims.

I claim:

1. In an improved multi-color, offset printing press for printing on paper; the combination of; a frame, a blanket cylinder secured to said frame, an impression cylinder

cooperating with said blanket cylinder, a paper feed, a power source, first and second plate cylinders geared to said blanket cylinder, and separate inking systems for said two plate cylinders; said inking systems including ink rolls in contact with plates on said plate cylinders when said press is in operation; combined with; moisture rollers contacting an ink roller for each of said plate cylinders; the one of said ink rollers being contacted by a moisture roller for said first plate cylinder being an ink roller that engages a plate on said first plate cylinder, remains free of contact with other ink rolls and is the first ink roll to engage a given portion of a plate on said first plate cylinder after such given portion of a plate has deposited ink on said blanket cylinder during a printing cycle; the other of said ink rollers contacted by a moisture roller being one that engages a plate on said second plate cylinder, contacts at least one second ink roller for said other plate cylinder and is the last ink roller to engage any portion of a plate of said second plate cylinder after such portion of a plate has deposited ink on said blanket during a printing cycle.

2. In an offset printing machine; a blanket cylinder; an impression cylinder cooperating with said blanket cylinder; a plate cylinder geared to said blanket cylinder; an inking system including ink rolls engaging a plate on said plate cylinder during normal operation; a moisture carrying roller contacting the one of said ink rolls that engages a plate on said plate cylinder that is the first ink roll to engage any portion of a plate on said plate cylinder after such portion has deposited ink on said blanket cylinder; said ink roll contacted by said moisture carrying roll being free from contact with other ink rolls; means for placing moisture on said moisture roll; means for feeding paper between said blanket and impression cylinders; means for powering all of said foregoing elements and a frame supporting all of the foregoing elements in cooperative relationship to each other.

3. In an offset printing machine; a blanket cylinder; an impression cylinder cooperating with said blanket cylinder; a plate cylinder geared to said blanket cylinder; an inking system including ink rolls engaging a plate on said plate cylinder during normal operation; a molleton moisture carrying roller contacting the one of said ink rolls that engages a plate on said plate cylinder that is the last ink roll to engage a portion of a plate on said plate cylinder after it has deposited ink on said blanket cylinder; said ink roll contacted by said molleton moisture carrying roll being engaged also with at least one other ink roll; means for placing moisture on said molleton moisture carrying roll; means for feeding paper between said blanket and impression cylinders means for powering all of said elements; and a frame supporting all of the foregoing elements in cooperative relationship with each other.

4. In an improved multi-color offset printing press for printing on paper; the combination of a frame, a blanket cylinder, an impression cylinder, a paper feed, a power source, first and second plate cylinders geared to said blanket cylinder, and separate inking systems for said two plate cylinders; said inking systems including ink rolls in contact with plates on said plate cylinders when said press is in operation; a molleton roll for each of said two plate cylinders; said molleton rolls contacting ink rolls that contact plates on said plate cylinders; and means for placing moisture on said molleton rolls; one of said ink rolls contacted by a molleton roll contacts in addition solely a plate on one of said plate cylinders and is the first ink roll to contact a given portion of a plate on said plate cylinder after the given portion of a plate has deposited ink on said blanket cylinder during a printing cycle.

5. In an improved multi-color offset printing press for printing on paper; the combination of a frame, a blanket cylinder, an impression cylinder, a paper feed, a power source, first and second plate cylinders geared to said

blanket cylinder, and separate inking systems for said two plate cylinders including ink rolls in contact with plates on said plate cylinders when said press is in operation; combined with a molleton roll for each of said two plate cylinders; said molleton rolls contacting ink rolls that contact plates on said plate cylinders; and means for placing moisture on said molleton rolls; one ink roll contacted by a molleton roll contacts at least one other ink roll for a plate cylinder and is the last ink roll for said plate cylinder to contact a given portion of a plate on said plate cylinder after said given portion of a plate has deposited ink on said blanket cylinder during a printing cycle.

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