Oct. 15, 1929. T. E. KNOWLTON 1,731,467

METHOD AND APPARATUS FOR PREVENTING OFFSET IN PRINTING

Filed Feb. 26, 1927

Fig. 1

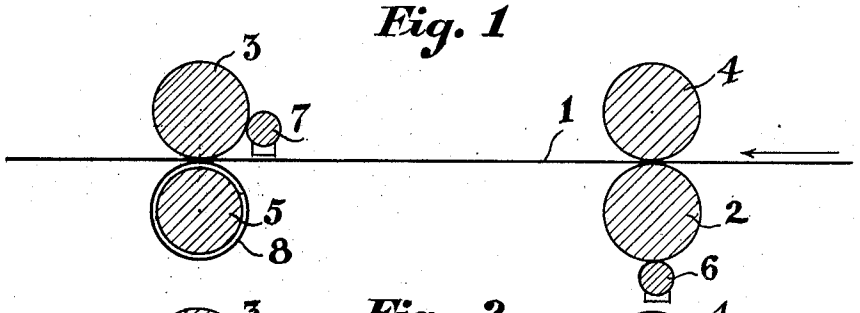


Fig. 2

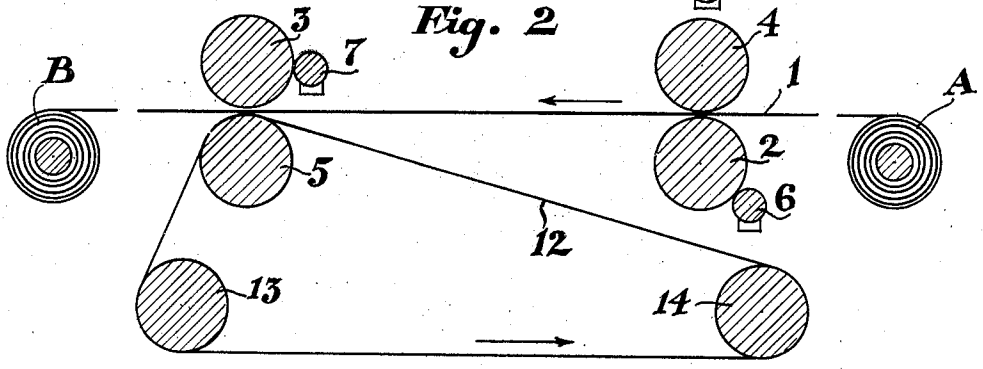


Fig. 3

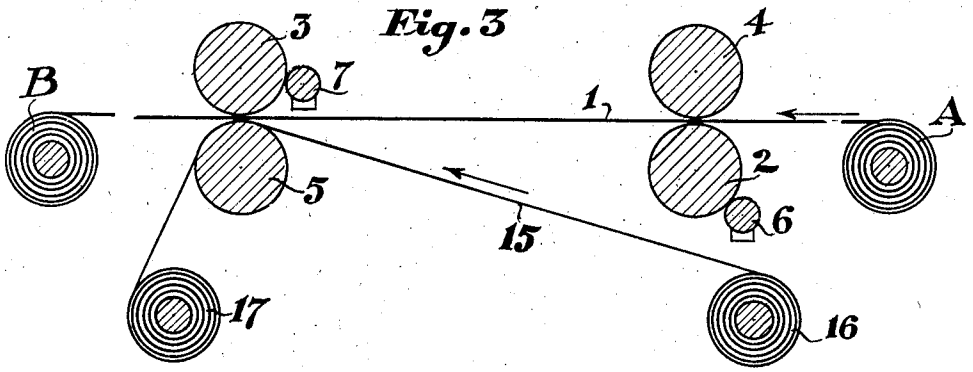
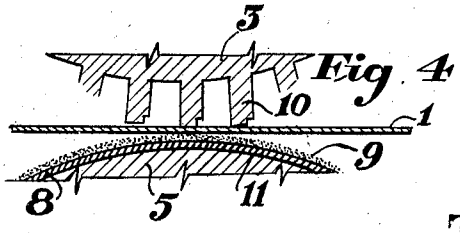


Fig. 4



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Patented Oct. 15, 1929

1,731,467

UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR PREVENTING OFFSET IN PRINTING

Application filed February 26, 1927. Serial No. 171,175.

This invention relates to a method and apparatus for printing whereby both sides of a blank sheet may be printed with characters, marks, colors, or symbols in clear, distinct outlines without any smearing or blurring resulting on the previously printed side.

The invention consists in the novel methods, combinations and arrangements hereinafter described or claimed for carrying out the above-stated object and such other objects as will hereinafter appear.

This invention may be readily understood by reference to certain exemplifications thereof described in the following specification. In such exemplifications the sheet to be printed, for example paper, is fed through any conventional type of printing apparatus having one of the tympan rolls provided with a roughened circumference. I have illustrated herein only that part of the printing apparatus which is utilized to carry the present invention into effect.

In the drawings:

Figure 1 is a view in central vertical sectional elevation of that part of a printing apparatus embodying my invention;

Figure 2 is a similar view of another modification;

Figure 3 is a similar view of still another modification;

Figure 4 represents, on a larger scale, the peripheral structure of the second series of print and tympan rolls.

Referring to the drawings, 1 designates a blank sheet which is fed from reel A through a printing apparatus and then wound upon reel B or otherwise disposed of after it has been printed. The sheet is printed on both sides by feeding same in contact with a series of printing rolls disposed to print first on one side and then on the reverse side of the blank. In the illustrative construction, a series of printing rolls 2 and 3 are horizontally disposed with the roll 2 arranged to print the sheet on the bottom side and the print roll 3 arranged to print the sheet on the reverse side. Roll 4 is a conventional tympan roll cooperating with the printing roll 2 to support the sheet while the printed matter is being imparted thereto, and 6 typifies an inking device for the print roll. While I have shown the printing rolls to be horizontally disposed, it will be understood that this is merely one illustration. They may be vertically disposed or arranged in any other desired manner to print alternately on first one side and then on the other side of the sheet without departing from the spirit of the invention.

Print roll 3 of the second series of printing rolls is similar to print roll 2, and is likewise provided with an inking device represented at 7. However, after the blank has been printed on one side and is then printed on the reverse side before the ink has dried, care must be taken to avoid smearing or blurring of the printed side. It has been customary heretofore to run an off-set sheet of ink repellent material over the tympan roll 5 to avoid destruction or injury to the printed side, but this has meet with only partial success. Even though the off-set sheet be a special grade of material, it will not prevent blurring of the outlines or avoid picking up the ink from the sheet while in contact with the blank. Because it does take on ink from the printed sheet, the off-set sheet is unfit for continuous use without imminent danger of injury to the printed matter on the blank.

I have discovered that smearing or blurring of the printed side can be avoided by providing an off-set sheet or roll of special construction or surfacing the conventional tympan roll with a roughened sheet 8, such as emery or sandpaper, or the like, the coated side being arranged to contact with the printed surface of the sheet while it is being printed on the reverse side. A sheet so supported while being printing on the reverse side will not mar nor blur the already-printed side nor absorb any ink therefrom. While there may be other circumstances contributing, the theory advanced for this novel result is that the printed sheet is supported at a myriad of points or ridges 9 (Fig. 4), thereby preventing the ink from being squeezed laterally over the surface of the blank, or if any negligible amount of ink is squeezed laterally when any of the type 10 presses against the blank directly above the points or ridges, it

would tend to flow down the side of the points or ridges rather than be squeezed laterally over the surface of the printed blank. Or if the type presses the blank directly above any one of the depressions 11, the blank would be supported between the points or ridges and thus not be brought into direct contact at these places with the off-set sheet. Also the air which is trapped in these depressions contributes to support the paper between the ridges. These points or ridges would in emery or sandpaper, or the like, appear in irregular arrangement, however, they might be arranged uniformly or irregularly, such as directly on the face of the tympan roll by providing cross vertical or diagonal grooves or the like.

If a paper facing is used on the tympan roll, it could be tightly clamped or fastened in any well known manner about the face of the roll 5 as shown in Fig. 1. The modification in Fig. 2 shows the roughened supporting sheet as an endless belt 12 circumvolved over the tympan roll 5 and one or more idlers 13 and 14.

The modification in Fig. 3 shows the roughened supporting sheet 15 being traversed from feed roll 16 over the tympan roll 5 to a winding roll 17, after which it may be used over and over again.

Obviously, the present invention is not restricted to the particular embodiments herein shown and described, neither is it necessary that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and sub-combinations.

Having described preferred embodiments of my invention, I claim:

1. A method of preventing offset in printing characterized by printing a blank sheet upon one face, supporting the sheet on a dry rough surface, and then printing the sheet on the reverse side.

2. A method of preventing offset in printing characterized by printing a blank sheet upon one face, supporting the sheet on a dry ridged surface, and printing the sheet on the reverse side while same is supported on the ridged surface.

3. A method of concomitantly printing a blank sheet on opposite faces comprising feeding a sheet in contact with a printing element, traversing a dry ridged support in contact with the sheet, and feeding the sheet in contact with a printing element while supported on said support to print the reverse side of the sheet.

4. A method of concomitantly printing a blank sheet on opposite faces comprising feeding one face of a sheet in contact with a printing roll, traversing a dry serrated support with the sheet, and printing the reverse face of the sheet while on the serrated support.

5. A method of preventing offset in printing a blank sheet on opposite faces comprising printing one face of the sheet, supporting the sheet on the printed face over a dry serrated surface, and simultaneously printing the reverse face.

6. The method of preventing offset in printing a blank sheet on opposite faces comprising first printing one face of the sheet, traversing the sheet in contact with a dry mineral surfaced roll, and simultaneously printing the reverse face.

7. The method of successively printing opposite faces of a continuously traversing sheet and supporting said sheet on a dry serrated surface to receive the subsequent print.

8. Printing apparatus comprising a series of printing rolls disposed to print on opposite faces of a sheet, tympan rolls cooperating with the printing rolls, and a dry serrated means cooperating with the print roll which prints the reverse face of the sheet.

9. Printing apparatus comprising a series of printing elements disposed to print alternately on opposite faces of a sheet, supporting means cooperating with the printing elements, and a dry rough surfaced sheet associated with the subsequent supporting means to prevent dispersion of the ink on the initially printed face.

10. In a printing apparatus of the character described, means for successively printing on opposite sides of a continuously traversing sheet and dry serrated means for supporting the sheet subsequent to the initial printing.

11. In a printing apparatus of the character described, means for printing one face of a traversing sheet, means for printing the reverse face of the sheet, and a dry serrated offset roll cooperating with the second printing means.

12. In a printing apparatus of the character described, a printing and tympan roll for printing one face of a sheet, a printing and tympan roll disposed to print the reverse side of the sheet, and a dry mineral-coated means traversing with the second tympan roll to contact with the printing face of the sheet.

13. A printing apparatus of the character described comprising a printing device, a platen associated with the printing device, and means having a dry irregular surface cooperating with the platen to support a printed blank while being printed on the reverse side.

14. A printing apparatus comprising a printing device, a platen associated with the printing device, and a facing for the platen provided with dry irregular surface to support a printed blank while being printed on the reverse side.

15. A platen means for a printing apparatus having a dry irregular surface on which a printed sheet is adapted to be supported while being printed on the reverse side.

16. A method of preventing offset in print-

ing characterized by printing a blank upon one face, supporting said blank on a platen with the printed side in contact with emery paper, and printing the reverse side while in contact with said emery paper.

17. Printing apparatus comprising a series of printing rolls disposed to print on opposite faces of a blank, tympan rolls cooperating with the printing rolls, and a facing of emery paper surrounding the tympan roll which supports the blank while being printed on the reverse side.

18. A platen means for a printing apparatus having a facing of emery paper on which a printed sheet is adapted to be supported.

In testimony whereof, I affix my signature.

THEODORE E. KNOWLTON.