March 28, 1939. T. E. KNOWLTON 2,152,263

METHOD AND APPARATUS FOR PREVENTING OFFSET IN PRINTING

Filed April 28, 1930

Fig. 1.

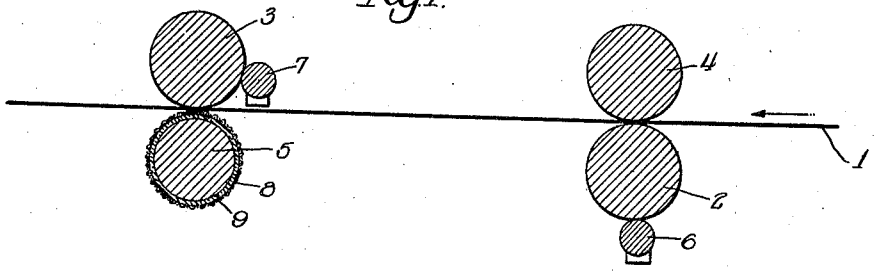


Fig. 2.

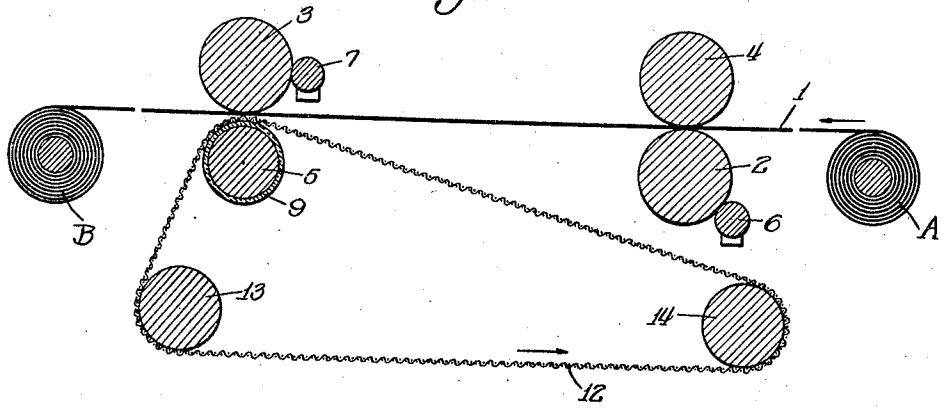


Fig. 3.

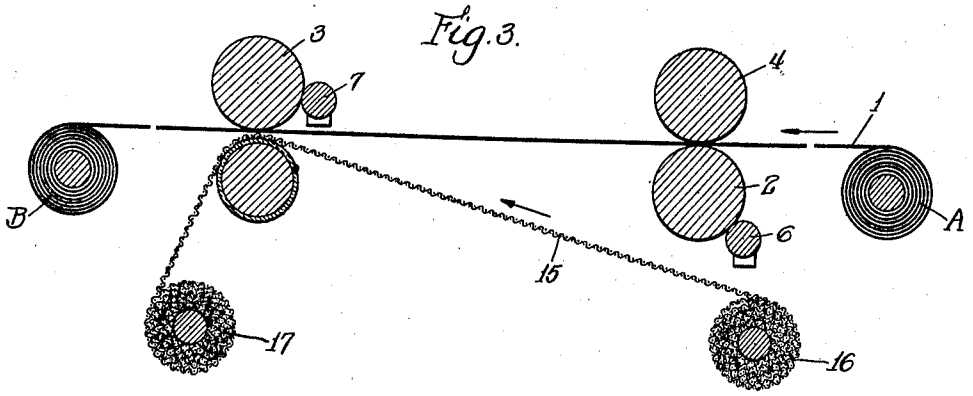
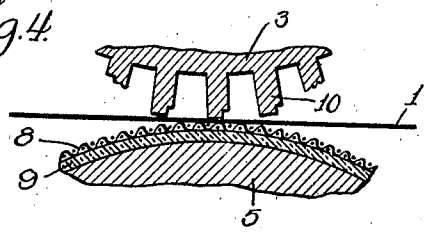


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR PREVENTING OFFSET IN PRINTING

Theodore E. Knowlton, New York, N. Y.

Application April 28, 1930, Serial No. 447,962

20 Claims. (Cl. 101—420)

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. It pertains particularly to the impression or tympan cylinder or cylinders faced with a novel and improved printer's blanket for directly contacting with the blanks to be printed.

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

This invention may be understood readily by reference to exemplifications thereof described in the following specification. In such exemplifications, a blank to be printed, for example paper, is fed through any conventional type of printing apparatus having one of the tympan cylinders provided with a foraminated covering, which is typified by a finely meshed screen sheet of suitable material, preferably of metal. Illustration has been made only of that part of the printing apparatus which is utilized to carry the present invention into effect.

In the drawing:

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

Fig. 2 is a similar view of another modification;

Fig. 3 is a similar view of still another modification; and

Fig. 4 represents, on a larger scale, the peripheral structure of the second series of printing and tympan cylinders.

Referring to the drawing, 1 designates a blank sheet which is fed from reel A through a printing apparatus and then cut in pieces, 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 illustrated constructions, a series of printing cylinders are horizontally disposed with roll 2 arranged to print the sheet on the bottom side and the printing cylinder 3 arranged to print the sheet on the reverse side. Roll 4 is a conventional tympan cylinder cooperating with the printing cylinders 2 to support the blank while the printed matter is being imparted thereto, and numeral 6 typifies an inking device for the printing cylinders. While I have shown the printing cylinders 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 blank without departing from the spirit of the invention.

Printing cylinder 3 of the second series of printing cylinders is similar to printing cylinder 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 on the printed side. It has been customary heretofore to run an offset sheet of ink repellent material over the tympan cylinder 5 to avoid destruction of or injury to the printed side, but this has met with only partial success. Even though the offset 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 offset sheet is unfit for continuous use without imminent danger of injury to the printed matter on the blank.

I discovered that smearing or blurring of the printed side could be avoided by providing an offset sheet or roll of special construction or surfacing a conventional tympan cylinder with a roughened covering such as emery or sand paper, or the like, all of which is described and claimed in Patent No. 1,731,467, issued to me on October 15, 1929.

As is clearly described in my patent, a partly printed sheet may be supported on an emery or sandpaper covering with the printed side in contact therewith while it is being printed on the reverse side. A sheet so supported while being printed on the reverse side will not mar or blur the already printed side nor absorb any ink therefrom.

The present invention is an improvement upon my prior patent and pertains to the use of a foraminated covering 8, typified by a 100 to 500 mesh screen cloth. This foraminated covering may be applied directly to the face of the tympan cylinder, over a conventional printer's blanket 9, or built up from one or more convolutions or plies of similar or coarser foraminated material. Employment of a conventional printer's blanket or underlayer of foraminous material is especially preferable where it is desired to provide a greater degree of resiliency beneath the blank to be printed while it is being impressed with type 10 on the printing cylinder.

The foraminated sheet may be tightly clamped over the face of the tympan cylinder in any well known manner (Fig. 1) or may be in the form of endless belt 12 (Fig. 2) circumvolved over tympan cylinder 5 and one or more idlers 13 and 14. In the modification of Fig. 3 the foraminated sheet is in the form of a strip 15 adapted to be traversed from feed roll 16 over tympan roll 5 to a winding roll 17, after which it may be used over and over again.

It will be appreciated that the foraminated

layer or sheet, because of the intersecting transverse and longitudinal strands and intervening meshes, provide a construction having elevated or projecting portions whereby the blank to be printed may be supported on a regularly or irregularly roughened surface, and this sheet may be dismantled advantageously for cleaning and replacement. Cleaning the blanket is rarely, if ever, necessary, for by reason of its novel character, very little ink is offset thereon and what little amount of offset ink there is, finds its way from the high points or ridges to the recesses therebetween. In that embodiment of Fig. 3 where the sheet is traversed from a supply roll and rewound after printing, the ridges and recesses provide air spaces whereby air may contact with the offset ink which is spaced from and held out of contact with the face of any juxtaposed layer by the points or ridges. As a result, a blanket, whether it be foraminated screening, or any other material embodying the invention can ordinarily be used throughout its serviceable life without being cleaned. There is more or less circulation of air in the air spaces when the offset sheet is rolled in a roll. It is especially adapted for use in the printing of newspapers, as well as higher grade work. In the printing of high quality work the ink on the initially printed side of the sheet must be completely dry before printing of the reverse side is attempted. The time required for drying the ink may be in some instances as long as twenty four hours. Therefore, if the same press is made ready to print the reverse side of the sheet by use of my improved printing blanket, then the blank may be immediately fed to the printing apparatus to receive the printing on the reverse side, it being unnecessary for the ink on the printed side to be dry.

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

I claim:

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

2. A method of concomitantly printing a blank sheet on opposite faces comprising feeding a blank sheet in contact with a printing element, traversing a foraminated woven layer in contact with the blank sheet, and immediately feeding the sheet in contact with a printing element while supported on said support to print the reverse side of the sheet.

3. 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 flexible foraminated woven support with the sheet, and printing the reverse face of the sheet while on said foraminated support.

4. 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 side over a foraminated woven surface, and simultaneously printing the reverse face.

5. 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 woven screening layer, and simultaneously printing the reverse face of the sheet.

6. The method of successively printing opposite faces of a continuously traversing sheet and supporting said sheet on a woven screening layer to receive the subsequent print.

7. A method of preventing offset in printing characterized by printing a blank upon one face, supporting said blank on a platen with the printed side in contact with a finely meshed metal screening layer, and printing the reverse side while in contact with the screening layer.

8. In a printing apparatus of the character described, means for successively printing on opposite sides of a continuously traversing sheet, and a woven screening layer for supporting the sheet subsequent to the initial printing.

9. 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 foraminated woven layer traversing with the second tympan roll to contact with the printed face of the sheet.

10. 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 woven screen faced offset roll cooperating with the second printing means.

11. A printing apparatus of the character described comprising a printing device, a platen associated with the printing device, and means faced with a woven screening layer cooperating with the platen to support a printed blank.

12. A printing apparatus comprising a printing device, a platen associated with the printing device, and a facing for the platen comprising a woven metal layer having a surface provided with elevated portions, to support a printed blank on its printed side without offset.

13. A platen means for a printing apparatus having a foraminated woven layer having elevated portions on which a printed sheet is adapted to be supported on its printed side without offset.

14. 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 finely meshed metal screening surrounding the tympan roll which supports the blank while being printed on the reverse side.

15. A platen means for a printing apparatus having a facing of finely meshed metal screening on which a printed sheet is adapted to be supported.

16. A printer's blanket for a paper printing device comprising a finely meshed metal screening.

17. A printer's blanket comprising superposed sheets, the exterior of which is a finely meshed metal screening.

18. A printer's blanket for a paper printing device comprising a foraminated sheet having elevated portions adapted to contact with the paper to be printed and prevent offset.

19. A printer's blanket for a paper printing device comprising a finely meshed screening adapted to contact with the paper to be printed.

20. A printing apparatus comprising a printing device, a platen associated with the printing device, and a facing for the platen including a flexible woven metal layer provided with elevated portions to contact a printed blank and prevent offset.

THEODORE E. KNOWLTON.