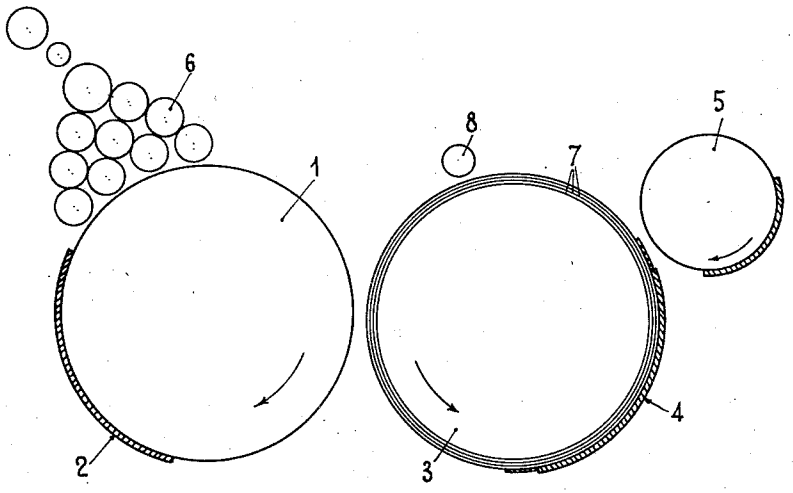
Mar. 3, 1925.

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M. DE' SPERATI

OFFSET PRINTING MEANS

Filed May 26, 1924



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UNITED STATES PATENT OFFICE.

MARIANO DE' SPERATI, OF TURIN, ITALY.

OFFSET-PRINTING MEANS.

Application filed May 26, 1924. Serial No. 716,020.

To all whom it may concern:

Be it known that I, MARIANO DE' SPERATI, subject of the King of Italy, residing at Turin, Italy, have invented certain new and useful Improvements in Offset-Printing Means, of which the following is a specification.

The present invention relates to means for producing prints from printing plates, comprising an intermediate or transfer surface on which an inked printing plate produces an image which is then transferred on the paper to be printed.

The present invention has for its object a layer adapted to produce an intermediate or transfer surface for said purpose, which is particularly useful in connection with the printing of photocollographic or gelatin printing plates.

According to the present invention said layer consists of a material containing a colloidal substance, and its operative or transferring surface is treated to be in condition to take off ink from the printing plate and transfer it to the paper to be printed, while the underlying portion of said layer is able to absorb and retain moisture and release it gradually to its said surface.

For the use of the layer according to the present invention a printing machine may be used which comprises an intermediate drum between the plate carrying drum and the platen drum.

The figure of the annexed drawing shows diagrammatically the essential parts of a machine adapted for the use of the layer according to the present invention.

In said figure, 1 is a drum carrying a printing plate 2, and 3 is an intermediate or offset drum carrying a sheet 4 of the material according to the present invention which is hereinafter particularly described.

The drum 5 is a platen drum carrying the paper or other material to be printed on, and adapted to press at the required time said paper or other material against the transfer or offset drum 3 and transfer layer 4; 6 are inking rollers delivering ink to the printing plate 2 at each revolution of the drum 1 carrying it. 7 is a pad of a material adapted to retain moisture, as hereinafter described, and 8 is a roller adapted to come in contact with the transfer layer to impart moisture to the same layer or remove moisture from it, as hereinafter described.

Of course the above described arrangement is disclosed merely for the purpose of explanation and the transfer layer according to the present invention may be used in machines of any other appropriate kind.

According to the present invention the sheet 4 intended to transfer the inked image from the printing plate 2 to the paper sheet is provided with a layer of an emulsion of colloidal substances preferably with added substances as hereinafter described, and said layer has its operative or ink transferring surface somewhat hardened to put it in condition to take off the ink from the printing plate and to transfer said ink to the paper, while the portion of said layer underlying said transfer surface retains the property of absorbing and storing moisture, this property being peculiar to colloidal substances, and is able to deliver said moisture at its transfer surface.

The transfer surface of said layer may be hardened by treating it with an alkaline bichromate bath and by exposing it to the action of light to cause said alkaline bichromate to make hard the exposed skin of the layer; the skin when treated in this manner is able to retain the ink taken off from the printing plate and to deliver it to the paper or other material to be printed.

The same result may be obtained by treating said layer of colloidal substances in other manners adapted to harden the skin thereof, say by an alum bath, by an alcohol bath, or other hardening substances, or substances able to improve the property of the layer skin of retaining greasy ink used in printing may be incorporated in the same layer. For this purpose may be used starch, gummy materials, or powdered earthy substances as barium sulfate, magnesium oxid and the like.

Hereinafter is disclosed a method for producing and treating a transfer layer according to the present invention.

Ten parts of gelatin of medium hardness are dissolved in water in a boiling water bath, and to such a solution is added, while stirring, a solution of 3 parts of wheat starch in 20 parts of water, and then are added one part of white glycerin and 0,2 part of phenol; the mixture is filtered.

The emulsion thus obtained is spread on a paper sheet which preferably is slightly sized or glued and is very strong, or on a very fine grain fabric; said emulsion is pref-

erably spread by mechanical means to obtain a very uniform layer of about 35/1000 millimetre thick.

The layer is then sensitized in a 3% solution of bichromate of potassium in water, is dried in darkness by hot air and is exposed to day light or to an arc-light until an intense chromatization of the exposed surface or skin of said layer is obtained, said chromatization progressively decreasing in the portion of said layer underlying its skin from this skin towards the surface adhering to the supporting sheet. The layer is finally washed and dried.

In use, the sheet provided with said layer is located on the offset or transfer drum 3 of the printing machine, said sheet being indicated at 4 in the drawing, and the pad 7 consisting of a plurality of superimposed sheets of wetted cloth is located between said drum and sheet 4; the sheet 4 may also be wetted in a bath of water containing glycerin before being located on said drum and pad.

The transfer layer is thus nearly dry on its skin or transfer surface because of the hardening treatment imparted thereto, and the amount of moisture contained therein progressively increases in its underlying portion.

The transfer surface of the layer is thus sufficiently hard and resistant to receive from the printing plate the whole amount of ink of the image and to apply it to the paper without being injured from this latter, while the internal moisture may be delivered through said transfer surface by effect of the pressure imposed on the said layer for printing and inking purposes, and it puts said transfer layer in condition to apply the ink to the paper to be printed.

In the operation of the machine the several drums and rollers are driven in rotation to cause the printing plate 2 to take ink from inking rollers 6 and to deliver it to the transfer sheet 4 when contacting therewith, while this transfer sheet on coming in contact with the paper located on the platen drum 5 applies to the same the ink it has taken off from said printing plate 2 and produces on the paper the requisite image.

The roller 8 is adapted to contact with the sheet 4 located on drum 3 and provides for removing moisture from sheet 4 should this sheet and its transfer layer contain a much too large amount of moisture, or said roller may be used to impart additional moisture to said layer if desired.

This provisison for intermittently wetting the transfer layer surface instead of wetting the printing plate 2 makes it possible to treat photocollographic plates in the same manner as lithographic plates.

Hereinafter are given other compositions for producing the intermediate or transfer layer according to the present invention.

I.

	Parts by weight.
Water	100
Medium hardness gelatin	9
Barium sulfate	2
Glycerin	1
Phenol	0,2

II.

Water	100
Fish glue	10
Gamboge gum	2
Glycerin	1

III.

Water	100
Medium hardness gelatin	10
Magnesium oxid	2
Glycerin	1
Phenol	0,2

IV.

Water	100
Medium hardness gelatin	10
Barium sulfate	3
Glycerin	2
Phenol	0,2

The last mixture is particularly useful when the transfer layer is to be used in a nearly dry state.

The addition of glycerin in the described mixtures is useful in keeping said layer in the requisite moistened state, independent of its being wetted by the pad supporting it or by the wetting roller, as hereinbefore described.

The described mixtures may be spread on a paper sheet or on a sheet of a water-pervious or water-impervious fabric, and may be put on the market in a condition in which they may be easily utilized.

It is also advisable to cause the operative surface of the transfer layer to be more or less grained or matted by pouring the mixture on a suitably grained or matted surface or by embedding therein grains of a substance, as powdered pumice stone, metal powders, or the like; a similar result may also be obtained in the case of a layer made hard by treatment with alkaline bichromate and light, by locating a net in front of the skin of said layer before exposing it to light, said net being adapted to cause the light to act to different extents in the different portions of the skin.

Of course the present invention is not restricted to the operations and mixtures above referred to, and the said mixtures may be modified or combined with each other and the described hardening and other treatments may be used in respect of the several

mixtures for improving the operation of the transfer layer without departing from the scope of the present invention as hereinafter claimed.

What I claim as my invention and desire to secure by United States Letters Patent is:—

1. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance; such layer having its skin treated to render it capable of taking ink and transferring it to the surface to be printed, the underlying portion of said layer being adapted to retain moisture applied at the back and release it at said skin.

2. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance; such layer having its skin treated to render it hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture applied at the back and adapted to release it at said skin.

3. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance; such layer having its skin treated to render it hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture applied at the back to a progressively decreasing extent starting from said skin.

4. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance; such layer having its skin sensitized by an alkaline bichromate and exposed to light, whereby said skin is rendered hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being adapted to retain moisture applied at the back and release it at said skin.

5. Transfer means for offset printing, embodying a layer of a material which comprises gelatin; such layer having its skin sensitized by an alkaline bichromate and exposed to light, whereby said skin is rendered hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being adapted to retain moisture applied at the back and release it at said skin.

6. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance and glycerin; such layer having its skin treated to render it hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture and adapted to release it at said skin.

7. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance and gummy substances; such layer having its skin treated to render it hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture and adapted to release it at said skin.

8. Transfer means for offset printing, embodying a layer of material which comprises a colloidal substance and starch; such layer having its skin treated to render it hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture and adapted to release it at said skin.

9. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance; such layer having its skin hardened and grained or matted so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture applied at the back and adapted to release it at said skin.

10. Transfer means for offset printing, embodying a layer of a material which comprises a colloidal substance; such layer having its skin hardened by treatment with an alkaline bichromate and light and grained or matted so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture applied at the back and adapted to release it at said skin.

11. Transfer means for offset printing, embodying a liquid-pervious supporting sheet and a colloidal layer thereon; such layer having its skin treated to render it hard so as to take ink and transfer it to the surface to be printed, the underlying portion of said layer being pervious to moisture and adapted to release it at said skin.

12. In offset printing means, a pad adapted to be wetted, and an image ink transferring means adapted to be superimposed on said pad while wet, said superimposed means comprising a liquid pervious supporting sheet and a layer of colloidal substances on said sheet, said layer having its skin hardened to take ink and its underlying portion pervious to liquids.

In testimony whereof I affix my signature.

MARIANO DE' SPERATI.