

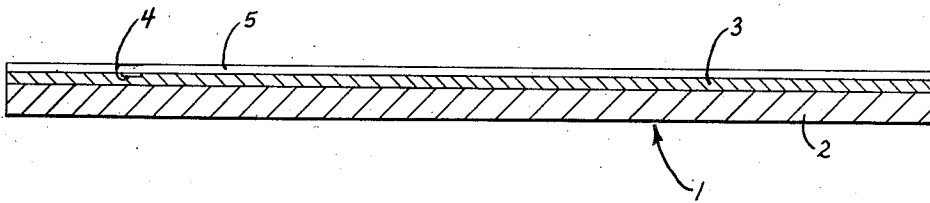
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PAPER PLANOGRAPHIC PLATE

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PAPER PLANOGRAPHIC PLATE

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This invention relates in general to improvements in the art of record form duplication and is more particularly concerned with the production of planographic form material for use in duplicating machines such as the Addressograph-Multigraph Duplicator and like duplicating machines. In its more specific aspects, the invention relates to and is concerned with the production of a specially treated, light-weight paper sheet suitable for use as a printing plate on an offset type duplicating machine.

Although duplication planographically has attained widespread use in the art, such duplication has recognized disadvantages, particularly with respect to costly operation in general, quality of reproduction and the limited number of legible copies which may be produced.

It is therefore a prime object of the invention to provide a new and improved printing form or printing plate of the foregoing character which is inexpensive to manufacture and which will produce a more legible image than other known lightweight paper plates.

A further object is to provide a low-cost, lightweight paper plate useful in offset duplication to produce a vastly increased number of copies having the appearance of the original.

Another object is to provide a printing plate of the aforesaid type which may be prepared by the simple expedient of applying but a single coating of a new and improved coating composition to an ordinary, light-weight base sheet of bond paper, thus minimizing the cost of manufacture.

A still further object is to produce a printing plate of this character which is suitable for use with distilled water as well as with most commercial fountain solutions and etches.

Another object is to produce a plate which will afford good reproduction with an ordinary typing ribbon and good transmission of impression below through to carbon in an interleaved form.

Another object is to provide a paper base planographic printing plate having a new and improved planographic printing surface which has the desirable advantages, properties and characteristics hereinbefore pointed out and others which are inherent therein.

The foregoing and other objects of the invention are achieved by applying to one surface of a light-weight base bond paper, preferably of 10 to 24 lbs. weight and 17 x 22-500 basis, a single thin coating film in thickness of from 1 to 5 thousandths of an inch, of a novel emulsion to be described in more detail hereinafter.

The aforesaid novel coating composition of the present invention has the property of rendering the paper not only water receptive, but ink repellent when wetted. This characteristic makes the paper suitable for offset printing as employed in duplicating machines. In the use of this plate, it is wetted from a fountain by rolls, and the portions without a greasy image are wetted uniformly. The imaged portions remain dry. The plate is then subjected to inking from a fountain by means of rolls, which

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ink only the non-wetted imaged portions. This is then transferred in the usual offset manner to a blanket which prints the image on copy paper.

The coating which imparts these desirable properties to the paper is a particular composition of specific materials admixed one with the other in certain critical proportions. Basically, the composition consists essentially of equal parts of (1) sodium carboxymethyl cellulose, (2) a thermosetting resin from the group consisting of urea-formaldehyde and melamine-formaldehyde resins and (3) an inorganic salt from the group consisting of ammonium nitrate, ammonium phosphate and ammonium sulfate. Equal quantities of these materials are each mixed with water in the proportion of 2-8 parts per 100 parts water. A hygroscopic material such as glycerin may be added in the proportion of 2 to 12 parts per 100 parts water to minimize paper wrinkling. A strong base such as ammonium hydroxide is added in the proportion of 1-3 parts per 100 parts water. The foregoing ingredients are compounded in accordance with the following general formulation:

Sodium carboxymethyl cellulose.....g--	10-40
Melamine-formaldehyde	10-40
Ammonium nitrate.....g--	10-40
Ammonium hydroxide.....cc--	5-20
Glycerin	0-50
Water	300-800

A specific and desirable formula is:

Sodium carboxymethyl cellulose.....g--	20
Melamine-formaldehyde	20
Ammonium nitrate.....g--	20
Ammonium hydroxide.....cc--	10
Glycerin	50
Water	400

As stated hereinbefore, it is essential that all of the ingredients of the foregoing formulations be admixed in the indicated critical proportions. Otherwise, the final product will be grossly inferior or totally inoperative for its intended purpose.

The mixtures are heated to approximately 160° F., and preferably agitated, to form stable emulsions.

For convenience in describing the printing plate of the invention, and more particularly the preferred process for its manufacture, reference is now had to the accompanying drawing in which said plate is depicted in cross section in the single figure. The printing plate or record material 1 is prepared from a web of bond paper 2 of the particular character hereinbefore set forth by applying thereto, through the use of conventional applicator rolls and on one side only, a single film 3 of the described coating material which imparts desirable properties to the plate or form. The film 3 is heat treated at 200° to 400° F. from 30 seconds to 30 minutes. It is tough, flexible and firmly adhering.

Thusly prepared, the filmed side will have color to indicate the face of the material for printing. In its chemically processed state and prior to printing, the web is receptive to ink 4 as well as water 5. Therefore if the printless face is wetted, the entire face would be unfavorably receptive to ink and in a planographic device would not pick up ink. Consequently there would be no transfer. However, to effect a transfer, the dry ink receptive web is printed as with regular printer's ink which is receptive to similar inks. When water is applied thereto, ink of the wetted form retains dryness whereby it affords adhesion of applied ink. Consequently it is evident that a form of the character described will, when wetted, pick up ink with print images only, and when processed in a planographic device, will in an offset manner transfer identical markings to the blanket roll. The blanket roll will transfer these

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markings to other material as a duplicate, using the original as a printing plate or planographic form.

With respect to the ability of the printed form to serve as a printing plate, it is proposed to use such forms in any position in a set of manifolding forms as presently employed in manifolding machines such as tabulators, typewriters, autographic registers and the like capable of recording in multiplicate. The film applied to the record material of the invention is receptive to ribbon impressions and carbon sheet impressions are likewise receptive to ink when the form is wetted. Therefore, multiple copies of a manifold set wherein a volume of copies beyond the capacity of a set is desirable, may be removed from the set for insertion into the duplicating machine and are capable of reproducing up to 400 copies from each carbon copy. As an example, if a manifold set provides 20 copies, each copy is capable of producing 400 copies or a total for the set of 8000 copies, as each copy is a printing plate.

The forms or plates are applicable for use in autographic registers wherein interleaved carbon sheets are employed for manifold copies. Since carbon black impressions are water repellent the impressions will be receptive to ink and serviceable as printing plates. Furthermore the original copy of any manifold set may be inscribed with wax-like pencil media in such a manner that it may be used for planographic duplication.

What is claimed is:

1. A planographic printing plate comprising a bond paper base sheet having therein a tough, flexible, firmly-adhering coating, in thickness of from 1 to 5 thousandths of an inch, which results from the application to one surface of said sheet and subsequently heating, a composition consisting essentially of an emulsion containing 10-40 g. sodium carboxymethylcellulose, 10-40 g. melamine-formaldehyde in the thermosetting stage, 10-40 g. ammonium nitrate, 5-20 cc. ammonium hydroxide, 0-50 cc. glycerin and 300-800 cc. water, said coated sheet being heated at 200°-400° F. for 30 seconds to 30 minutes.

2. A planographic printing plate comprising a bond paper base sheet having thereon a tough, flexible, firmly-adhering coating, in thickness of from 1 to 5 thousandths of an inch, which results from the application to one surface of said sheet and subsequently heating, a composition consisting essentially of an emulsion containing 20 g. sodium carboxymethyl cellulose, 20 g. melamine-formaldehyde in the thermosetting stage, 20 g. ammonium nitrate, 10 cc. ammonium hydroxide, 50 cc. glycerin and 400 cc. water, said coated sheet being heated at 200°-400° F. for 30 seconds to 30 minutes.

3. A planographic printing plate comprising a bond paper base sheet of 10 to 24 pounds weight and 17 x 22—500 basis having thereon a tough, flexible, firmly-adhering coating, in thickness of from 1 to 5 thousandths of an inch, which results from the application to one surface of said sheet and subsequently heating, a composition consisting essentially of an emulsion containing 10-40 g. sodium carboxymethyl cellulose, 10-40 g. melamine-formaldehyde in the thermosetting stage, 10-40 g. ammonium nitrate, 5-20 cc. ammonium hydroxide, 0-50 cc. glycerin and 300-800 cc. water, said coated sheet being heated at 200°-400° F. for 30 seconds to 30 minutes.

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4. A planographic printing plate comprising a bond paper base sheet of 10 to 24 pounds weight and 17 x 22—500 basis having thereon a tough, flexible, firmly-adhering coating, in thickness of from 1 to 5 thousandths of an inch, which results from the application to one surface of said sheet and subsequently heating, a composition consisting essentially of an emulsion containing 20 g. sodium carboxymethyl cellulose, 20 g. melamine-formaldehyde in the thermosetting stage, 20 g. ammonium nitrate, 10 cc. ammonium hydroxide, 50 cc. glycerin and 400 cc. water, said coated sheet being heated at 200°-400° F. for 30 seconds to 30 minutes.

5. A process for preparing a planographic printing plate which comprises applying to a bond paper base sheet of 10 to 24 pounds weight and 17 x 22—500 basis a thin coating of a composition consisting essentially of an emulsion containing 10-40 g. sodium carboxymethylcellulose, 10-40 g. melamine-formaldehyde in the thermosetting stage, 10-40 g. ammonium nitrate, 5-20 cc. ammonium hydroxide, 0-50 cc. glycerin, and 300-800 cc. water, and then heating the coated sheet at 200° to 400° F., for 30 seconds to 30 minutes, to leave on the sheet a dried film in thickness of from 1 to 5 thousandths of an inch.

6. A process for preparing a planographic printing plate which comprises applying to a bond paper base sheet of 10 to 24 pounds weight and 17 x 22—500 basis a thin coating of a composition consisting essentially of an emulsion containing 20 g. sodium carboxymethyl cellulose, 20 g. melamine-formaldehyde in the thermosetting stage, 20 g. ammonium nitrate, 10 cc. ammonium hydroxide, 50 cc. glycerin, 400 cc. water, and then heating the coated sheet at 200° to 400° F., for 30 seconds to 30 minutes, to leave on the sheet a dried film in thickness of from 1 to 5 thousandths of an inch.

7. A planographic printing plate comprising a bond paper base having thereon a tough, flexible, firmly-adhering coating, in thickness of from 1 to 5 thousandths of an inch, which results from the application to one surface of said paper base and subsequently heating a composition consisting essentially of a water emulsion containing 10-40 g. of sodium carboxymethylcellulose, 10-40 g. of a thermosetting resin, in the thermosetting stage, from the group consisting of melamine-formaldehyde and urea-formaldehyde resins, 10-40 g. of a salt from the group consisting of ammonium nitrate, ammonium phosphate and ammonium sulfate, 5-20 cc. of ammonium hydroxide, 0-50 cc. of glycerine and 300-800 cc. of water, said coated sheet being heated at 200° to 400° F. for 30 seconds to 30 minutes.

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