June 23, 1931. A. B. POSCHEL 1,811,804

DECALCOMANIA AND DECALCOMANIA PAPER

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Fig. 1.

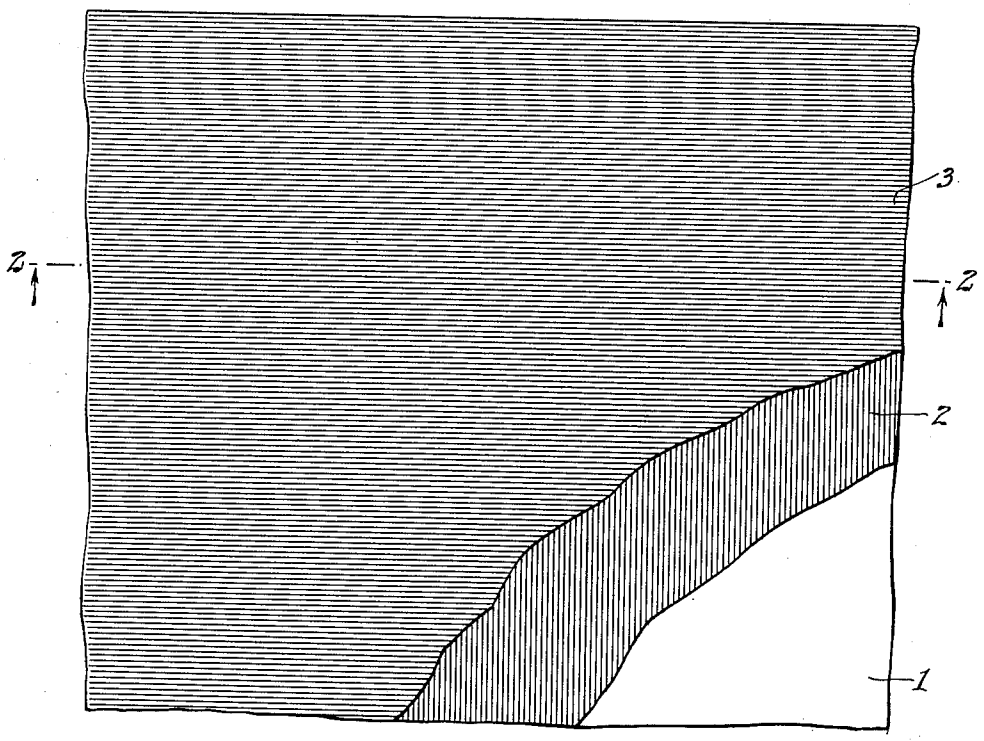
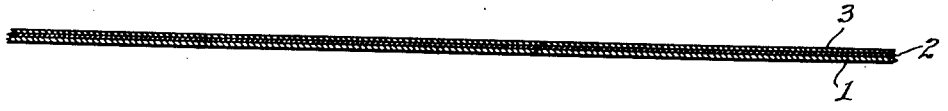


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE

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DECALCOMANIA AND DECALCOMANIA PAPER

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This invention relates to an improved process for the manufacture of decalcomanias, and has for an object to provide a special coated paper which may be used even with high-speed offset printing presses.

Another object of the invention is to provide an improved paper for receiving decalcomania printing even from a high-speed offset printing press without smearing.

A further object of the invention is to provide an improved decalcomania including a specially prepared paper having both a water soluble and a water non-soluble coating with a decalcomania impression on the water non-soluble coating.

In the accompanying drawings,—

Figure 1 is a plan view of a section of paper made according to the present invention, certain parts being broken away for illustrating the different coatings;

Figure 2 is a sectional view through Figure 1 on the line 2—2.

As is well known, decalcomania printing is a special line of the lithographic printing art. Many technical difficulties are presented in the producing of decalcomanias and in order to reduce these difficulties to a minimum, most of the printing is done on a flat bed printing press. Attempts have been made without practical success to use offset printing presses. These attempts resulted in failure principally because the ink would not dry properly in the time allotted, and also because much of the ink would not leave the printing cylinders, as the hard, smooth surface of ordinary decalcomania paper cannot pick up the ink from the offset rubber blanket in a satisfactory manner. As a matter of fact, heretofore when attempts were made to use an offset printing press the greater part of the ink would remain on the rubber blanket and would return to the pressed plate and very soon fill the same. Another objection has been that the paper had a tendency to stick to the blanket and to curl up on the edges so as to make automatic feeding very troublesome. Possibly the worst objection was the slow drying of the printing ink on the paper heretofore used. On the ordinary decalcomania paper now in common use the gum coating does not allow the printed ink to penetrate, and therefore, any ink deposited thereon must dry from the outer surface inwardly. This necessitates a relatively great amount of dryer in the ink to insure proper drying in the time required. Notwithstanding the addition of a large amount of dryer, the drying operation is relatively slow, and consequently, freshly printed sheets will offset on the backs of each other when stacked, if they are not slipsheeted or laid out singly. The use of offset printing presses is desirable by reason of the speed of these presses, but by reason of the various objections above outlined, such use has not been practical up to this time. In order to overcome these difficulties and make use of the offset printing presses for the commercial manufacture of decalcomanias and similar articles, a special decalcomania printing paper has been developed. In constructing or manufacturing decalcomania offset printing paper as just mentioned, a desirable structure includes the use of a raw paper stock of the general type now commonly used for the manufacture of ordinary decalcomania paper. Upon this stock is applied a coating of water-soluble material such as gelatin, gum or other similar material. On top of the water-soluble coating is applied a top coating of non-water-soluble material. This last coating of non-water-soluble material may be made of different materials, but preferably includes pyroxylin or cellulose-acetate dissolved in suitable solvents, though natural or synthetic resins could be substituted or added for the purpose of a film-forming agent. To this ingredient should be added a plastisizer like tricresylphosphate, castor-oil camphor or others. To these ingredients it is of great importance to add a proper amount of finely ground filler material, as for instance, talc, silica, magnesia or similar materials, as the final result depends upon the grained surface of the finished coated paper. In providing the finely ground filler material a 200 to 300 mesh screen may be used to secure the desired fineness in the filler material. As a dryer there may be used manganese dioxide or cobalt or other metallic

dryers dissolved in their respective solvents. The addition of the dryer to the non-water-soluble coating is of great importance, as is promotes the drying process of the ink printed thereon, and consequently, the ink dries quickly from the action of the dryer in the non-water-soluble coating and from the dryer in the ink when exposed to the air. In view of the fact that the dryer in the non-water-soluble coating assists in drying the ink, a much smaller amount of dryer may be used in the ink, as heretofore used, and better results secured. The purpose of this non-water-soluble coating is to produce on top of the gummed coated paper a thin, transparent and finely-grained layer which isolates the ink from the immediate contact with the water-soluble coating, and which is also suitable to pick up the ink from the rubber offset blanket perfectly and which assists the printing and drying. The use of this non-water-soluble coating also provides a paper which is less sensitive to moisture and which will not stick to the offset rubber blanket and does not offset on the back of the other sheets, if stacked automatically in an ordinary manner.

The above-mentioned paper and coating have been found to be desirable, but it is understood that this non-water-soluble coating could as well be applied to the ordinary, commercial decalcomania paper with the same results. When the finished decalcomania is used, namely, when the printed sheet is transferred to a new surface and the paper and water-soluble coating are removed, the non-water-soluble coating will remain on top. Usually this is of advantage, as its saves lacquering or otherwise coating the product. If desired, however, this non-water-soluble coating could be removed without damaging the print when the print is sufficiently dry. In forming the printed paper the same will appear as shown in the accompanying drawings wherein 1 indicates the paper stock of any desired kind, and 2 the water-soluble coating. On top of this water-soluble coating is a non-water-soluble coating 3, and on the coating 3 the offset printing press prints or deposits the picture or other matter forming the decalcomania.

When ordinary commercial paper or paper stock is used without any coating a suitable water-soluble coating must be added. This coating may be formed according to the following formula, viz:—3 parts gelatin, ½ part gum arabic, $\frac{1}{16}$ part glycerin, $96\frac{7}{16}$ parts water. If desired, the material forming the coating could be somewhat varied, and the following formula could be used for preparing the coating, said second water-soluble coating being as follows, viz:—4 parts starch, 4 parts gum tragacanth, 1⅞ parts gum arabic, ⅛ part glycerin, 90 parts water. After the coating 2 has been provided either by applying the coatings above suggested, or by using a commercially coated paper now in common use, a second coating is applied of non-water-soluble material. Several different formulæ could be used, but in each instance, the coatings should have a special kind of dryer which would coact with the ink deposited thereon, so that the ink would dry by reason of the dryer in coating 3, as well as by reason of the dryer in the ink itself.

As an example of what the non-water-soluble coating may be, the two following formulæ have been found to be very desirable:—3 parts pyroxylin, 50 parts butyl acetate, 20 parts ethyl acetate, 20 parts toluol, 2 parts tricresyl phosphate, 3 parts linseed oil, ½ part cobalt linoleate (dissolved in the heated linseed oil), ¾ parts talc (200 mesh screen filtered), ¾ parts gum elemi, or: 5 parts cellulose acetate, 20 parts ethyl acetate, 40 parts ethyl lactate, 28 parts toluol, 3 parts dibutyl phthalate, 2 parts linseed oil, ½ part manganese linoleate, 1 part silica (200 mesh screen filtered), ½ part gum dammar.

After the paper has been prepared as set forth it may be run through even an offset printing press at a comparatively high rate of speed and yet very desirable results secured, as the non-water-soluble coating 3 shown in the accompanying drawings will readily receive the ink. Also, this particular coating, by reason of the dryer therein, will cause the ink deposited thereon to dry quickly, whereby the sheets may be stacked immediately in a very short time.

Inasmuch as I have found that the new decalcomania or decalcomania paper of the present invention represents a novel and valuable advance in the art for use in connection with other than high-speed printing presses and in connection with other than offset printing presses, although originally worked out as aforesaid primarily to satisfy the object of providing a decalcomania or decalcomania paper adapted to be produced by or printed from a high-sped offset printing press, it is to be understood that the scope of protection contemplated, as indicated by the appended claims, is sufficiently broad to cover the decalcomania or decalcomania paper of the invention when resulting from, or intended for subjection to the action of, any type of printing press, regardless of whether or not such press is a high-speed one and whether or not such press is an offset printing press.

What I claim is:—

1. A decalcomania paper particularly adapted for high speed offset printing presses, comprising a paperstock, a water-soluble coating and a non-water-soluble coating placed on top of the water-soluble coatin, said non-water-soluble coating having as one of its ingredients a dryer capable of dry-

ing the ink deposited thereon from even high-speed offset printing press.

2. The combination with a high speed offset printing press using a decalcomania ink provided with a comparatively slow dryer, of a decalcomania paper for receiving said ink from said offset printing press, said paper being provided with a coating having a dryer forming part thereof which coacts with the dryer in said ink for quickly drying the ink as soon as deposited on the paper.

3. A decalcomania printing paper, including a paper stock, a water-soluble coating arranged on said stock and a non-water-soluble coating positioned on top of the first-mentioned coating, the non-water-soluble coating consisting of the following ingredients in approximately the following proportions: 3 parts pyroxylin, 50 parts butyl acetate; 20 parts ethyl acetate; 20 parts toluol; 2 parts tricresyl phosphate; 3 parts linseed oil; ½ part cobalt linoleate; ¾ part talc; ¾ part gum elemi.

4. A decalcomania printing paper comprising a paper stock, a water-soluble coating positioned on said stock, and a non-water-soluble coating placed on top of the water-soluble coating, said non-water-soluble coating having as one of its ingredients a filler making the surface of said coating very slightly grained, said filler also causing an increased ink absorptive effect to minimize sticking of sheets and to prevent offsetting of freshly printed sheets when stacked automatically.

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