Aug. 26, 1947. R. D. MARKSBERRY 2,426,462

DECALCOMANIA MANUFACTURE

Filed June 7, 1944

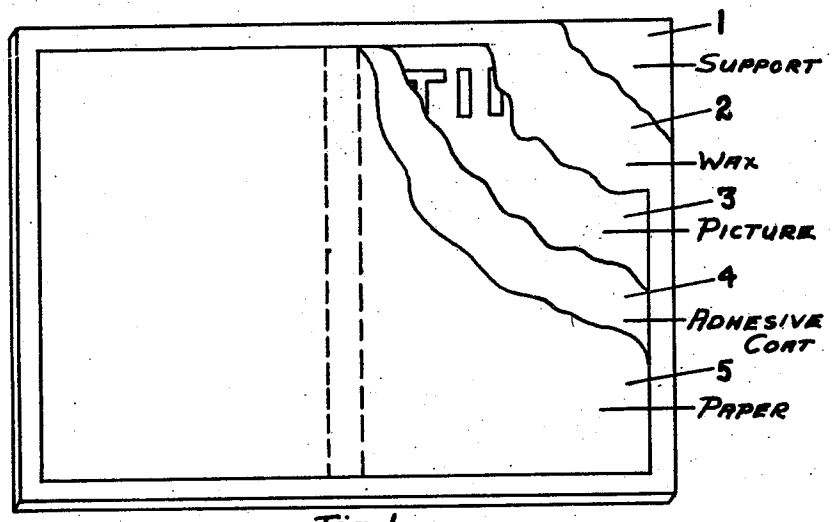


Fig. 1

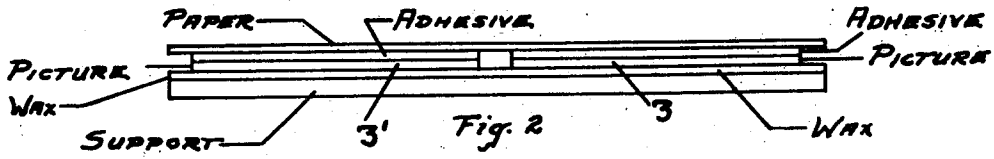


Fig. 2

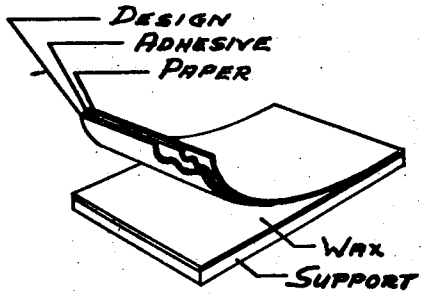


Fig. 3

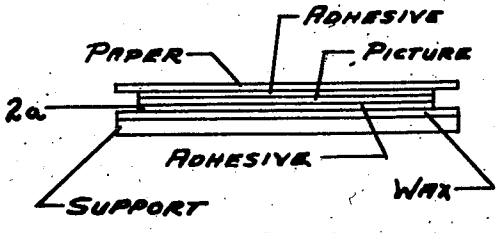


Fig. 4

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DECALCOMANIA MANUFACTURE

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1

This invention relates to improvements in the manufacture of decalcomania and other pictured fabrics, such as cloth, and even other papers than decalcomania, such as window shades and the like. It includes a new type of finished decalcomania in which the area of the backing between the pictures is free from adhesive.

It has been customary to make decalcomania transfers on specially prepared decalcomania paper, building up a picture by printing or the like. This paper has a specially prepared surface, usually composed essentially of a water-soluble adhesive of egg white, although different types of surfacing have been employed. It has been customary to build up the picture directly on this paper by successive applications of lacquer or printing or the like.

Various difficulties have been encountered in preparing the decalcomania picture on a paper backing because considerable time must elapse between the various applications of lacquer, etc., to permit the drying of one coat before the application of the next. For instance, in preparing a decalcomania by the usual method, the first application may be a coat of lacquer or its equivalent which covers the whole area of the decalcomania, and maintains the parts of the picture in their true relative positions when subsequently transferred from the finished decalcomania to a permanent base. This lacquer coat may be followed by one or more printings of letters, designs, etc. These may be followed by another coat of lacquer over the entire area. This forms a sandwich of the picture between two lacquer coats which is transferred intact when the decalcomania is used. Although lacquer is often used, it is not essential. Where a single printing is employed, of lacquer or ink or the like, no problem of registration has been encountered; but when several printings (or like application of lacquer, ink, etc.) are used, as, for example, in producing multicolor printings, great difficulty has been encountered in securing exact registration of the successive printings. The decalcomanias are usually formed on a large sheet of paper, which may contain a large number of pictures, even hundreds if the individual pictures are small. The sheets are centered on the press or other work table in the manner customary in printing establishments by bringing one corner of the paper to a given point. Due to changes in temperature and humidity between applications, the distance of the corner of the sheet opposite from this given point may vary a considerable fraction of an inch. Moreover, if the humidity is insufficient,

2

the sheet will curl (due to the lack of moisture in the coating of egg white or other adhesive), and the corner may not be brought to the given point but to a position just above this given point, and that will throw all the successive printings considerably out of register. Constant-humidity and temperature rooms have been resorted to, but the expense of such installations is considerable.

All such difficulties are removed by the present invention in which perfect registration is obtained. Waste due to spoilage is reduced, the cost of maintaining constant temperature and humidity conditions in the work room is eliminated, the difficulties inherent in the handling of thin paper sheets may be avoided, the rate of production may be increased and an improved finish obtained.

It has been customary to picture cloth (whether with letters, numerals or designs) by painting or printing directly on to the cloth, for example, in picturing velvet, velveteen, silk, satin, nylon, rayon, cotton, wool, canvas, window curtains, draperies, lamp shades, table cloths, napkins, handkerchiefs, hosiery, neckties, etc. One application of the picture is generally insufficient to uniformly coat the fibers, and several applications are required. Although the edges of the cloth may be fixed, the interior area shifts between applications so that exact registration has been impossible. For instance, in the printing of a velvet banner, with only one application of the ink or lacquer the fibers in the area contacted are not uniformly colored on all sides. Repeated applications produce a fuzzy outline due to shifting of the cloth. This difficulty is overcome by the present invention.

According to this invention the picture for a decalcomania, window shade, cloth banner or the like is built up on a temporary support of constant dimensions which always remains flat; or in the case of being printed on a cylinder press, the support would have to be flexible enough to go around the cylinder, but would then be returned to a flat state. It is preferably formed of a material which is more easily handled than paper or cloth, as, for example, cardboard, metal or the like. The surface of the temporary support is one from which the picture is easily transferred to a permanent paper or cloth backing by the use of a suitable adhesive coat which may be applied either to the picture or the backing of paper or cloth. Usually the adherence of the picture is only superficial. A strong bond may be formed which is later weakened by heat or

some equivalent treatment although this is not generally recommended, as where a metal support is coated with a low-melting wax, etc.

There are three general types of decalcomania herein referred to as (1) the varnish type, (2) the contact type, and (3) the slide-off type. The invention is applicable to all types. With the varnish type the picture is coated with a varnish and then transferred directly from the permanent paper support to its final support before the varnish dries. In preparing the contact type of decalcomania according to this invention, a suitable coating of adhesive is applied to the wax coating which covers the support, either as an overall coat or by printing to cover only the surface on which the picture is to be built up. This adhesive will protect the wax from attack by solvents used in preparing the picture, and in the slide-off type or varnish type of decalcomania and for picturing cloth a protective coating may be applied to the wax for the same purpose.

The invention will be further described in connection with the accompanying drawings which relate more particularly to the preparation of decalcomania but, likewise, illustrate the process of picturing cloth, etc. Fig. 1 is a plan view, partly in section, to illustrate the formation of the decalcomania. Fig. 2 is an end view of the assemblage shown in Fig. 1. Fig. 3 is a perspective showing of the finished decalcomania partly peeled from the temporary support, and Fig. 4 is an end view of a modification of Fig. 3.

In the drawings the temporary support 1, which may be cardboard, is covered with a suitable wax coating 2. This coating covers the entire surface of the support, and this will be the usual practice. The pictures 3, 3' are then built up on the wax support by hand or machine by any of the procedures now commonly employed, such as by an ordinary printing press, a lithographic press, a stencil, silk-screen printing, etc., in one or more colors. The usual lacquers and inks, etc., employed in building up the picture may be employed.

After building up the pictures by the application of the various coatings, including lacquers or the like to give a suitable background and to hold the printed or other design or lettering, etc., in place, the built-up pictures 3, 3' are coated with a water-soluble adhesive coat 4. While the adhesive coat is still wet, the paper 5 is pressed onto it. This is a water-absorbent paper which, when wet, carries the water to the back side of the picture and wets the adhesive, covering it more or less uniformly.

The pictures do not adhere to the wax coating any more than slightly, whereas there is a strong bond between them and the paper or cloth backing due to the presence of the adhesive coat 4. Therefore, after the adhesive coat dries, the finished decalcomanias may easily be removed from the wax coating. In fact, on drying, the paper may snap away from the temporary support and wax coating, carrying the pictures with it.

The temporary support may be made of cardboard, metal, wood, glass or other suitable stiff or flexible material which has a sufficiently smooth and permanently flat surface. A sheet of wax might be used.

The temporary support has a surface of wax or other suitable material to which the picture is preferably no more than slightly adherent. Suitable coatings may, for example, be prepared of paraffin, furniture polish, liquid or paste floor

wax or combinations of wax, resins, etc. The function of the coating is to receive and hold a picture or numerous pictures until completion thereof and subsequently release these on transferal to the paper or cloth backing. Ordinarily the surface of the temporary support will be slick and give a glossy finish to the finished picture. It may be pebbled, lined or the like if desired.

After the wax coating has been applied and dried to produce the temporary support, the picture is built up upon the waxed surface. This may be done by any of the processes now employed. A single picture may be applied to the temporary support although when small decalcomanias are desired, it will be usual to produce several or a large number of pictures on a single temporary support and then transfer these simultaneously to the permanent paper backing. The individual decalcomanias may then be cut from this backing. The pictures may be built up on separate temporary supports and then, by bringing the temporary supports together, they may be transferred simultaneously to a single paper backing. Ordinarily, however, the various pictures will be built up on a single temporary support.

In preparing the picture, a single application of lacquer, ink or the like may be used although the invention has particular application to pictures built up with two or more applications of lacquers, oil paints, enamels, printing inks, etc. The different applications may all be of the same material; but, generally, a combination will be used, as, for example, several applications of ink with one or more coatings of lacquer. The applications may be of the same color, or combinations of colors may advantageously be employed. For instance, letters, designs, etc., of one or more colors may be built up on a solid colored background or field. In the preparation of a sign the various letters may be united by a background or field, or the various letters may be entirely separate and distinct from one another.

After the picture has been built up, it is necessary to attach it to the permanent base. In preparing a decalcomania, this may be done by applying to the top of the picture a suitable adhesive or by using a paper, the entire surface of which has been treated with the adhesive. By using a transparent paper and limiting the application of the adhesive to the area occupied by the picture, the transparency of the sheet may be maintained and more accurate registration obtained on transferal to its permanent base. The adhesive may be a clear or colored paste or liquid lacquer or glue or mucilage or other vehicle suited for the intended purpose. In practice, water is used for the decalcomania transfer; and, therefore, a water-soluble adhesive is employed. In applying the paper sheet to the picture, care must be taken to register the paper with the support and to smooth it onto the support without disturbing the picture (or the coating of the adhesive if applied to the picture). The paper is pressed to the picture to secure adequate adhesion, and the adhesive is allowed to dry while the paper is thus maintained in register with the temporary support.

Although in the preparation of decalcomania by the usual processes a special coated paper is invariably used, the paper backing of decalcomania prepared according to this invention may be of any suitable type. A paper such as newspaper or the like will be found more satis-

factory than the type now employed because it is more absorbent.

If the picture is to be applied to cloth, as in the manufacture of a cloth banner, it is built up on the temporary support in the manner described, and the adhesive 4 will ordinarily be applied to the picture and not the cloth. Where the picture is thus attached to cloth, the adhesive need not be water-soluble and preferably is not, but forms a permanent bond with the cloth. For attachment to cloth, one will ordinarily employ a thicker layer of adhesive than for the manufacture of decalcomania. The process is thus applicable to the production of a preformed picture and its attachment to any backing, whether cloth, paper or the like.

Fig. 4 shows an alternative arrangement in which the temporary support is first coated with a coating 2*a* to protect the wax or to provide an exposed adhesive covering for a contact-type decalcomania. For a contact-type decalcomania the adhesive will be water soluble, as, for example, ordinary glue, albumin, egg white, etc. For window shades, cloth and the like a solvent type or thermoplastic adhesive may be used. Preferably, the adhesive does not form a permanent bond with the surface of the temporary support but is easily separated from the support after evaporation of any solvent or other liquid used with it.

It would be possible to use waxed paper as the temporary support, build up the picture on this using a lacquer or the like which forms a permanent bond with the wax, and then separate the picture by heating to soften the wax. The wax adhering to the exposed surface of the picture might subsequently be heated and used for bonding the picture to a suitable permanent base with a surface of wax or the like.

Referring now to Fig. 4, a decalcomania may be manufactured by coating a cardboard base 1 with a coating composed of 6 ounces of rosin, 2 ounces of beeswax, and 1 quart of turpentine subsequently thinned with 3 gallons of gasoline. A thin coating of such a solution on the cardboard on drying gives a temporary support with a glossy surface. This is coated with an egg-white adhesive coat 2*a*, which may cover the whole of the support or may be printed onto the support to cover only the area occupied by the picture or pictures. The picture may then be built up on this by applying one or more coats of a nitrocellulose lacquer over the whole support or only on the area to be occupied by the picture or pictures. Then one or more coats of printing ink are applied, and these are followed by another coat of lacquer. The solvent is evaporated from each application of lacquer or ink before a following application is made. Then another coat of the egg-white adhesive 4 is applied to the top of the picture or pictures, and while this is still wet, the paper is pressed in place, and the adhesive is then allowed to dry. The paper may be applied wet or dry. As the paper dries, it will probably curl enough to break the bond between the coating 2 and the adhesive 2*a*. This gives a contact-type decalcomania which may also be used for a slide-off type, in which latter case the adhesive 2*a* is washed off during the "slide-off" transfer. Omitting the adhesive 2*a*, a varnish-type or slide-off-type decalcomania is produced. For the decoration of window shades, cloth, etc., a rubber cement or other solvent-type adhesive may advantageously be substituted for the adhesive 4, and the coat 2*a* will be omitted unless

some protection of the wax is required with the particular lacquer employed. The adhesive 4 need not be a separate adhesive coat but may be the last layer of lacquer or the like to which the cloth, window shade, etc., is pressed while the adhesive is still wet.

What I claim is:

1. The method of preparing decalcomanias which comprises bulding up a plurality of pictures therefor by successive applications of constituents thereof in solution or suspension in a volatile liquid with vaporization of the liquid between applications, the applications being to a temporary support of permanent dimensions to which the pictures adhere and from which they are subsequently removed intact, covering each of the pictures with a water-soluble adhesive, and while the areas of the adhesive are wet, uniting a sheet of paper thereto, and subsequently separating from the temporary support the sheet of decalcomanias thus produced.

2. The method of preparing decalcomanias which comprises building up a plurality of pictures therefor by successive applications of constituents thereof in solution or suspension in a volatile liquid with vaporization of the liquid between applications, the applications being to a temporary support of permanent dimensions to which the pictures adhere and from which they are subsequently removed intact, and using lacquer over the whole areas occupied by the pictures as one of said applications to maintain the parts of the pictures in their true relative positions in a subsequent decalcomania transferal, covering each of the pictures with a water-soluble adhesive, and while the areas of the adhesive are wet, uniting a sheet of paper thereto, and subsequently separating from the temporary support the sheet of decalcomanias thus produced.

3. The method of preparing contact-type decalcomanias which comprises applying an adhesive to a temporary support of permanent dimensions to which it temporarily adheres and from which it is subsequently removed and thereby covering only the areas of the support to be occupied by pictures, then building up thereon a plurality of decalcomania pictures by successive applications of constituents thereof in solution or suspension in a volatile liquid with vaporization of the liquid between applications, covering each of the pictures with a water-soluble adhesive, and while the areas of the adhesive are wet, uniting a sheet of paper thereto, and subsequently separating from the temporary support the sheet of decalcomanias thus produced.

4. The method of preparing contact-type decalcomanias which comprises applying an adhesive to a temporary support of permanent dimensions to which it temporarily adheres and from which it is subsequently removed and thereby covering only the areas of the support to be occupied by pictures, then building up thereon a plurality of decalcomania pictures by successive applications of constituents thereof in solution or suspension in a volatile liquid with vaporization of the liquid between applications, and using lacquer over the whole of the areas occupied by the pictures as one of said applications to maintain the parts of the picture in their true relative positions in a subsequent decalcomania transferal, covering each of the pictures with a water-soluble adhesive, and while the areas of the adhesive are wet, uniting a sheet

of paper thereto, and subsequently separating from the temporary support the sheet of decalcomanias thus produced.

5. The process of producing and using a decalcomania which comprises printing one or more pictures by making a plurality of impressions with differently colored inks on a dimensionally stable background so as to obtain exact registry with the various impressions and transferring the picture or pictures thus produced to a water-absorbent backing by means of an adhesive layer which is adhered to the upper face of the picture or pictures while on the dimensionally stable background, thereby producing a decalcomania with a water-absorbent backing, and thereafter transferring the picture or pictures from the water-absorbent backing to a permanent location by a transfer process which involves the application of water to the water-absorbent backing.

6. In the process of producing a decalcomania the steps which comprise printing one or more

pictures by making a plurality of impressions with differently colored inks on a dimensionally stable background so as to obtain exact registry with the various impressions, and then transferring the picture or pictures to a water-absorbent backing, thereby producing a decalcomania with a water-absorbent backing.

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