Jan. 18, 1955 L. A. HANSEN 2,699,791

MANICURING DEVICE

Filed Oct. 24, 1952

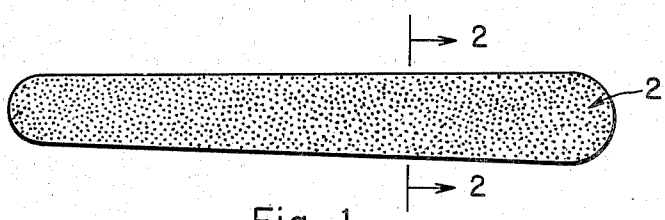


Fig. 1

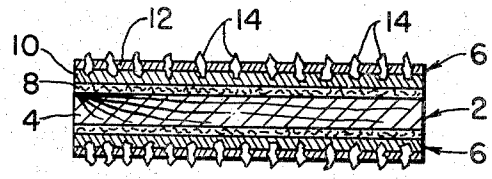


Fig. 2

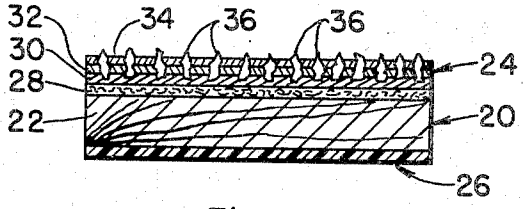


Fig. 3

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United States Patent Office 2,699,791
Patented Jan. 18, 1955

2,699,791

MANICURING DEVICE

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Application October 24, 1952, Serial No. 316,739

7 Claims. (Cl. 132—76.4)

This invention relates to manicuring devices. More particularly, it is concerned with new forms of fingernail boards.

The so-called "fingernail boards" are widely used today as manicuring devices. They consist of a thin strip of firm, bendable material, such as lemonwood, covered with a sheet of abrasive material, generally on both sides. These boards are usually formed with rounded ends and may be from 1" to 7" in length and from ⅛" to 1" in width. Both sides of the board may be covered with the same type of abrasive sheet, but more generally one side of the sheet has a coarser abrasive coating than the other side so that the coarse side may be used for rapid trimming of the fingernails while the finer abrasive side is used for final touching up.

The majority of the fingernail boards are used by women. Since women are quite color conscious and their buying habits are controlled by the appearance and color of products, manufacturers of fingernail boards have begun to color the products in various pastel shades which they feel will appeal to the women buyers.

In the past, the coloring of the fingernail boards has been accomplished by applying dye to the surface of the finished product or by putting dye in the top adhesive layer of the abrasive coverings of which the boards are fabricated. Such products have certain deficiencies, e. g., the dyes with which the products are colored are primarily water soluble and the moisture present on the fingers of the user causes the dye to come off, i. e., "bleed," onto the user's fingers and to stain them. Furthermore, the appearance of the final products is not as lustrous or pleasant appearing as the products of this invention.

A principal object of the present invention is the provision of new, improved manicuring devices. Further objects include:

(1) The provision of new improvements in fingernail boards.

(2) The provision of means by which the identity, quality or nature of the abrasive surface of the fingernail boards may be quickly conveyed to a user by means of color.

(3) The provision of colored fingernail boards from which dye or other coloring matter does not bleed during use of the boards so that they may be used without staining the fingers or other things even though all the adhesives used in forming the coated abrasive surface are water-soluble.

(4) The provision of fingernail boards which have a unique colored lustre or sparkling appearance which is very pleasing.

Other objects and further scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

These objects are accomplished according to the present invention by the formation of fingernail boards from firm, bendable, thin strips of sheet material, preferably thin wood strips, and coated abrasive sheets adhesively bonded to the thin strips with the grit side outward, the coated abrasive sheets being made with an adhesive coat containing an appreciable amount of dye and a top adhesive coat which is substantially clear covering the dyed adhesive coat through which the dyed coat is visible giving an abrasive sheet having a pleasing colored lustre.

A more complete understanding of the invention and details of the new forms of products made possible by it can be had by reference to the accompanying drawings in which:

Figure 1 is a plan view of a fingernail board made in accordance with the present invention.

Figure 2 is an enlarged cross sectional view taken along the line 2—2 of Figure 1.

Figure 3 is an enlarged cross sectional view of a modified form of fingernail board in accordance with the present invention.

Referring in detail to the drawings, the fingernail board 2 comprises a thin, firm, bendable strip of sheet material 4 and coated abrasive sheets 6.

Preferably the thin strip 4 is made of wood, especially lemonwood or other wood of similar characteristics. However, the thin strip can be formed of plastic or other material which is flexible and yet sufficiently firm in thin sections to give the strength to the final board required to enable the resulting fingernail board to be forced against the fingernail and to contour the same.

The coated abrasive sheets 6 consist of a backing sheet 8, a maker adhesive coat 10, an adhesive sand size coat 12 and abrasive grain 14. The technical term for such abrasive sheets is "coated abrasive" although such sheets are more popularly referred to as "sandpaper" even though the abrasive grains of which the sheet is made are not "sand."

The backing sheet 8 is preferably made of paper, although other fabrics such as woven or unwoven cloth, fiber or the like may be used. The backing sheet 8 may contain various impregnants, modifying agents and the like as is well known in the art.

The abrasive grains or "grit" 14 are held to the backing sheet 8 by a sub-surface adhesive layer 10. This first adhesive layer over the backing is technically referred to as a "maker coat." According to the present invention, this maker coat contains an appreciable amount of dye giving the coat a decided colored appearance.

Over the top of the maker coat is another adhesive grain bonding layer which is technically called a "size coat." According to this invention, the size coat 12 contains no dye. It is preferably compounded so that it is substantially clear enabling the colored maker coat layer to be viewed through it.

If there are more than two adhesive layers, the first would be called the "maker coat" and the remaining, the "size coats," unless there is more than one layer of grain. In such case, the adhesive coats fastening the grain layers would be the first, second, etc. maker coats as the case may be, and the remaining coats, the size coats. The coated abrasive sheets with which this invention is concerned always have at least one size coat.

If desired, the presize usually employed in coated abrasives, i. e., the sealing layer applied before the maker coat, may be colored with dyes or pigments. The use of a different color in the presize from that used in the maker coat can give unusual, pleasant color effects to the final product.

The success of the present invention is due to a large extent to the discovery that the dye in the maker coat will not bleed onto the fingers of a user even though the size coat 12 is made of water soluble adhesive which is readily softened by moisture on the hands of the user. Furthermore, it was discovered upon fabrication of finger boards of the type herein described, that when the dye is incorporated in the maker coat, as contrasted to inclusion in the size coat, the resulting product acquires a unique, sparkling appearance or lustre, although it would be expected that by covering the dyed layer with another adhesive coat, a dulling effect would result. This may be due to a "lens" effect created by the small grains of abrasive which are slightly embedded in the maker coat 10 augmented by the plain background of the size coat.

The "non-bleeding" qualities of the new fingernail boards can be strikingly demonstrated by a simple test which easily distinguishes these new products from prior

known colored fingernail boards made with water soluble adhesive materials. The test is referred to as the "blot" test and is carried out by taking a piece of white blotting paper, saturating it with water and pressing it firmly for about 2 seconds against the surface of the fingernail board. The fingernail boards made in accordance with the present invention leave the blotting paper white and unstained. On the other hand, fingernail boards of the prior art, i. e., with dye in a water-soluble size coat, stain the wet blotting paper the color of the fingernail board. It is also possible to distinguish the products of this invention from the fingernail boards having dye in the top or sand size coat by microscopic inspection of a surface, or preferably, a cross-section of the products.

The maker and size coat may be of the same composition or one form of adhesive may be used for the maker coat and a distinct other type of adhesive may be used for the size coat. Water soluble type of adhesives such as glues, e. g., bone, hide, casein, soya-bean, etc., gums, e. g., British gum, dextrine gum, arabin type gums, etc.; starches, e. g., solubilized, the type of U. S. 2,609,284, etc.; or mixtures of these with other protein or carbohydrate materials are preferred as the adhesive component. However, other materials, such as synthetic plastic adhesive materials, may be used. Fillers, pigments or the like may be incorporated in the sub-surface adhesive coat or coats, but the surface coat is preferably left unpigmented and unfilled so that it is substantially clear and is as colorless as the glue or other adhesive content will permit.

The abrasive grain **14** may be of any form known to the art. In most cases, a fine grit of flint is used on one surface to give an abrasive coating which may be used to finish the nails or for slow cutting. Generally, the other side of the board is coated with abrasive garnet paper of the same or other grit size which gives a more severe abrading action and enables a greater amount of the nail to be cut away in less time than the finer flint size. However, if desired other types of grain such as aluminum oxide, silicon carbide, powdered glass or the like can be used.

A modified form of fingernail board according to this invention is shown in Figure 3. The board **20** consists of thin wood strip **22** coated on one surface only with the coated abrasive sheet **24** while the other surface is covered with plastic material or lacquer **26**. The plastic coating **26** may, for example, contain printed matter, photographs, embossing, or other ornamentation.

Coated abrasive sheet **24** consists of a backing sheet **28**, one maker coat **30**, a first size coat **32**, a second size coat **34** and a single layer of abrasive grain **36**. The maker coat **30** may be dyed or left uncolored as desired. On the other hand, the size coat **32** contains appreciable dye, whereas the size coat **34** is left undyed and substantially clear so that the colored layer **32** is visible through it giving the abrasive side of the board **20** a colored, lustrous appearance.

The following illustrative examples of actual operations in making fingernail boards in accordance with the present invention give further details of these new products and their formation. In the examples, all parts are by weight and reference to glue means hide glue unless otherwise specified.

EXAMPLE 1

This example illustrates the formation of a fingernail board such as shown in Figure 2 coated on one surface with abrasive, red colored, flint paper and on the other surface with abrasive garnet paper also colored red.

Production of the garnet paper

A making adhesive which consists of 15.6%—62 millipoise glue, 7.6% Douglas gum #5408 (a starch-dextrine gum obtained from Penick & Ford Ltd., New York 17, N. Y.), 24.6% $CaCo_3$ filler, 36.2% water and 16.0% of a 6.3% dye solution (1.008% dye solids based on the total solids) is placed in the adhesive-heating apparatus of a sandpaper machine and brought to a temperature of about 180° F. to insure uniform distribution of the gum and then allowed to cool to 130° F. for application.

Dyes that have been found particularly suitable for use in the invention are colors which were typed and classified as Food, Drug and Cosmetic colors. The dye used in this example was of that class and designated as F. D. & C. Red No. 3.

The calcium carbonate filler used is of special size as disclosed in U. S. Patent 2,322,156.

The adhesive is applied to a backing of 40 lb. Duracel paper at a temperature of approximately 130° F. after which #2/0 fines garnet abrasive grain is applied to the making coat of adhesive on the backing by conventional gravity feed means. In another case, a conventional electrostatic coating method was used with good success for applying the abrasive grain.

The web coated with the making coat of adhesive and the abrasive grains is then moved into a conventional sandpaper drying room and heated at about 100° F. for 1½ hours to dry the binder.

After the binder has been so dried, the abrasively coated web is moved through a conventional sandpaper sizing machine where the sizing coat of adhesive is added. In this example the sizing coat consists of a 26% aqueous solution of 62 millipoise glue. The size is applied by a conventional roller-coating apparatus at a temperature of about 160° F.

The amount of the size added is controlled partly by weight but, to a greater extent, by visual judgment. Dryable contents of a sizing solution of about 2.5 lbs. per sandpaper ream are usually satisfactory. After this sizing operation the web is again passed to a conventional sandpaper drying room and heated to dry the glue. After drying, the colored coated abrasive material is batched in some suitable manner prior to the assembly of the colored nailboard.

Production of the flint paper

The coated abrasive material in which grit #2/0 flint grain is used, employs a 62 lb. kraft paper backing and is made and sized similar to the material described above.

Production of the fingerboards

A composite sheet for the colored nailboards is made by adhesively attaching the colored garnet and flint papers as made above to a backing of lemonwood by the use of an adhesive such as glue. The composite colored nailboard is formed by placing the sandwich coated abrasive layers together, with the lemonwood core at the center and the abrading surfaces on either side of the core, back to back with the abrading surfaces facing outward.

This operation is accomplished on a conveyor type belt in which one side of a lemonwood core is coated with a glue adhesive and the colored garnet paper placed grit side out firmly against the adhesive surface. The lemonwood core is turned over on its uncoated side, another layer of adhesive is applied to the core and a layer of the flint paper grit side out placed firmly against the adhesive surface.

The resulting laminated sheet is then die-cut into fingernail boards of the shape shown in Figure 1. They possess a sparkling, lustrous, red color on both sides with the garnet paper side being slightly different in appearance from the flint paper side. It is found that when the boards are used for manicuring of fingernails no bleeding of the dye from the board takes place. This is in contrast to experience with fingerboards made with dye in a glue-sand-size coat from which dye readily bleeds in use.

EXAMPLE 2

This example illustrates manufacture of colored abrasive sheet material composed of colored presize and maker adhesives and a transparent size coat which may be used in forming colored fingernail boards by the process described in Example 1.

As a backing for grit 2/0 flint abrasive grain, 62 lb. kraft paper is used. The presize consists of 17%—62 millipoise glue, 0.55% F. D. & C. Red #3 Dye, 0.33% F. D. & C. Blue #1 dye and 82.12% water. The solution is placed in the adhesive-containing apparatus of a sandpaper adhesive-applying machine and heated to a temperature of about 140° F. At this temperature the adhesive is applied to the front or coat side of the paper web by the adhesive applying calendar rolls of the machine in the amount to yield about 0.2 lb. per sandpaper ream of dryable contents. The amount of presize is controlled by the depth and roundness of color desired in the final product, but is also governed to a greater extent by weight, since a minimum amount of about 0.2 lb. per sandpaper ream of dryable material is necessary to give a satisfactory level shade in the finished product.

After the presizing operation, the web is air dried in festoon form. The paper is then removed from the racks and mounted on a sandpaper making machine. An adhe-

sive for the making coat of adhesive is prepared by mixing 15.6 parts of 62 millipoise glue, 7.6 parts of Douglas gum #5408, 24.6 parts of special sized $CaCo_3$ filler, 52.1 parts water, 0.07 parts F. D. & C. Red #3 dye, and 0.045 parts of F. D. & C. Blue #1 dye. This mixture is thoroughly stirred at 180° F. to insure uniform distribution of the dye and gum in the adhesive solution. The adhesive so prepared is placed in the adhesive-containing means of a sandpaper making machine and applied at a temperature of about 140° F. The web of presized paper is passed through the machine and a making coat of the adhesive to the extent of about 2.4 lbs. per sandpaper ream of the adhesive solution is coated thereon by means of the calendar rolls of the machine. The web then continues its passage through a grain-applying means where an abrasive coating of 6.2 lbs. per sandpaper ream of grit No. 2/0 flint grain is attached to the adhesive coating.

The web with the grain attached is then hung in festoon form and dried at room temperature and humidity.

After the making coat is dried, the web is passed through a sandpaper sizing machine where a sizing coat of adhesive is applied in the usual way at a temperature of about 150° F. The sizing adhesive is prepared by mixing 17.5 parts 62 millipoise glue, 8.5 parts Douglas gum #5408 with 74 parts of water. After the sizing operation, in which about 9.6 lbs. per sandpaper ream of the solution are applied over the grains, the web is passed into a conventional sandpaper drying room to satisfactorily set the adhesives. A satisfactory drying cycle for the sized product is about 1½ hours at about 150° F. and 50% relative humidity, although adjustments are made in this drying cycle as required according to the variations in the raw materials and conditions of operations as is known by those skilled in the art.

The resulting product is a violent pastel colored abrasive flint paper having a pleasing sparkling, lustrous appearance.

EXAMPLE 3

This example illustrates making of a colored nailboard in which the core consists of a flexible but firm plastic material such as cellulose acetate, and the exterior abrasive surfaces comprise colored abrasive sheets which are composed of a colored glue maker adhesive and a transparent glue size coat.

As a backing for the grit 2/0 garnet abrasive grain, 40 lb. Duracel paper is used. The adhesive for the making coat is prepared by adding 3 parts of 6.3% solution (.189 parts solids) Green D. & C. dye #7 to 100 parts of 38% 86 millipoise glue. This colored adhesive is placed in the adhesive-container of a sandpaper making machine and brought to a temperature of about 130° F. The web of paper is passed through the machine and a making coat of adhesive to the extent of about 2.2 lbs. per sandpaper ream of the adhesive solution is coated thereon by means of the calendar rolls of the machine. The web then continues its passage through a grain-applying means where an abrasive coating of 5.9 lbs. per sandpaper ream of grit 2/0 garnet grain is attached to the adhesive coating.

The web with the grain attached is then hung in festoon form and dried at 100° F. and 35 per cent relative humidity.

After the making coat is dried, the web is passed through a sandpaper sizing machine where a sizing coat of adhesive which consists of a 26% aqueous solution of 86 millipoise glue is applied in the usual way at a temperature of 100° F. After the sizing operation in which about 9.0 lbs. per sandpaper ream of the solution are applied over the grains, the web is again passed into a conventional sandpaper drying room to set the adhesive. A satisfactory drying cycle is 1 hr. at 100° F. The dried material is then rolled up and held until the nailboard is assembled.

Assembly of the nailboard is accomplished by use of a die-out on the abrasive material, which cuts it to the suitable size and shape. These die-out portions are then adhesively attached to nailboard core of sheet cellulose acetate giving a flexible, laminated product.

I claim:

1. A manicuring device comprising a firm bendable thin strip of sheet material and a coated abrasive sheet adhesively bonded with the grit side outward to at least one surface of said strip, said abrasive sheet comprising a backing web which is adhesively bonded to said bendable thin strip, an adhesive coat containing an appreciable amount of dye overlying said backing web and an undyed top-surface adhesive coat covering said dye containing coat, the dye containing coat being visible through said top coat giving said sheet a colored lustre.

2. A manicuring device comprising a sandwich of a thin strip of wood between two sheets of sandpaper, said sandpaper having abrasive grain bonded to the paper backing by a maker coat containing an appreciable amount of a water-soluble dye overlaid by a substantially clear size coat through which the dye in the maker coat is visible giving the sheet a colored lustre.

3. A fingernail board comprising a sandwich of a thin strip of wood between two sheets of sandpaper, the sandpaper comprising a water soluble dye in a water-soluble maker coat and a substantially clear, undyed size coat comprising a water-soluble adhesive through which the maker coat dye is visible giving a sheet having colored lustre.

4. Products of the class described having at least one sub-surface adhesive layer bonding abrasive grit to a backing sheet comprising an appreciable amount of dye and a top adhesive layer which is substantially clear through which said dyed layer is visible giving a lustrous, colored appearance to the surface of the product.

5. Fingernail boards comprising sandpaper sheets having a sub-surface adhesive layer containing an appreciable amount of water-soluble dye bonding grit to a paper backing and a substantially clear, undyed adhesive layer, covering said sub-surface layer, said dye being visible through said top layer giving the boards a lustrous colored appearance.

6. Colored fingernail boards from which the dye does not bleed during use comprising sandpaper sheets having a sub-surface grit bonding adhesive layer containing glue and a water-soluble dye and a top, water-soluble, clear, undyed adhesive layer covering said sub-surface layer, said dyed sub-surface layer being visible through said top layer giving the board a lustrous colored appearance.

7. Colored, lustrous appearing, fingernail boards comprising sandpaper surfaces, said sandpaper having a dyed adhesive maker coat and undyed size coat through which the dye of said maker coat is visible.

References Cited in the file of this patent

UNITED STATES PATENTS

2,183,930	Brekke	Dec. 19, 1939
2,375,814	Oglesby	May 15, 1945
2,633,139	Pettey	Mar. 31, 1953