Jan. 12, 1926. 1,569,056

W. C. WELCH

COLORED PATENT LEATHER AND PROCESS OF MAKING THE SAME

Filed July 8, 1925 2 Sheets-Sheet 1

Fig. 1

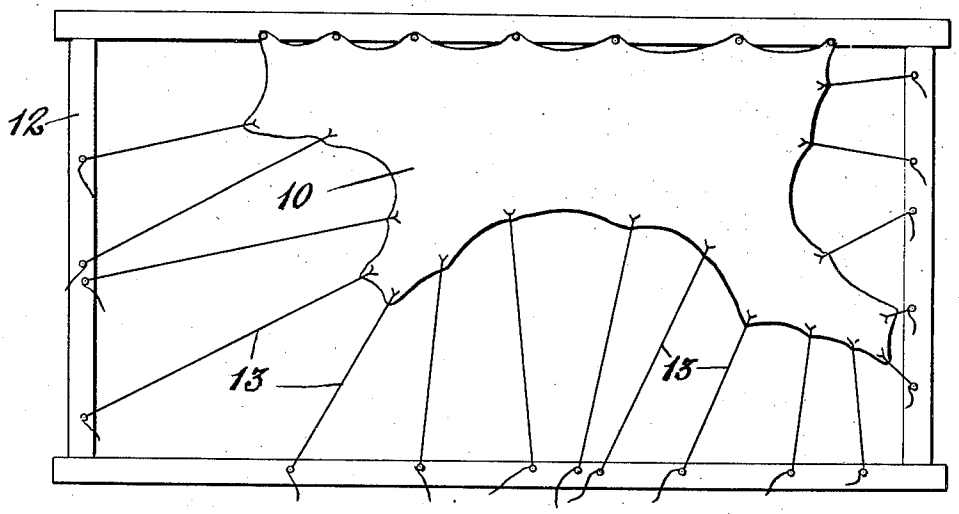


Fig. 2

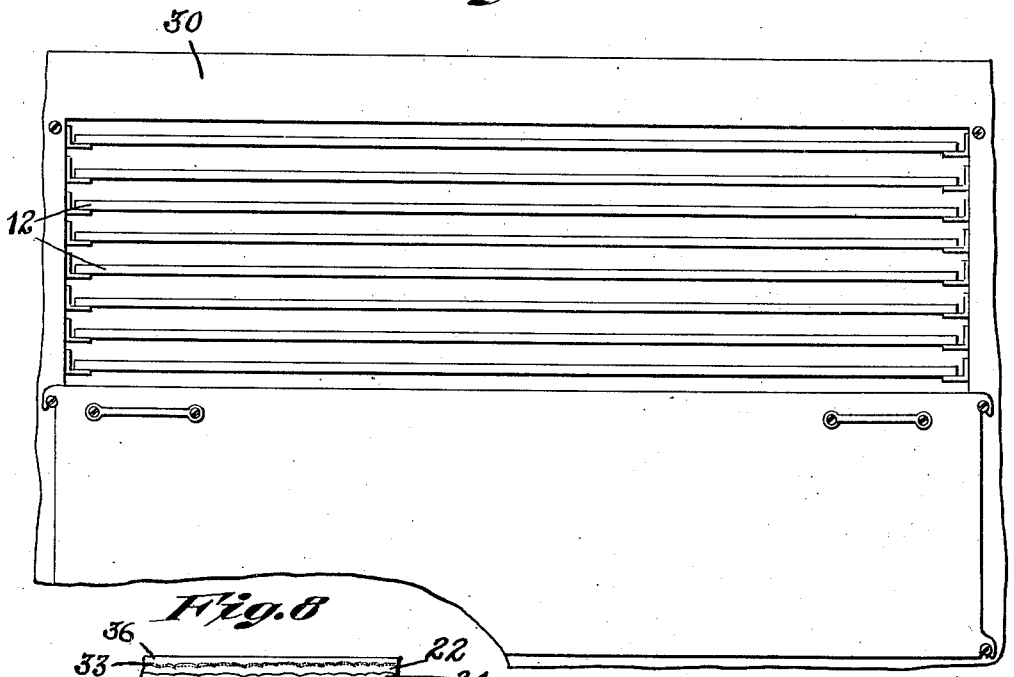
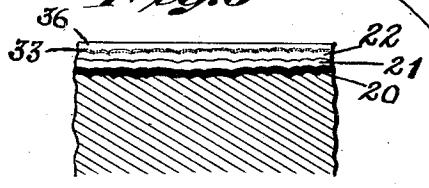


Fig. 8



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Fig. 3

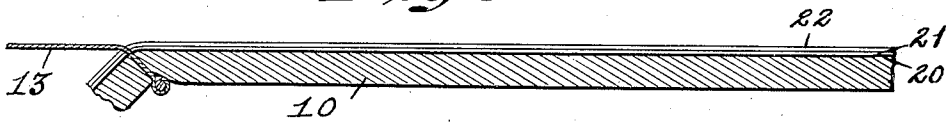


Fig. 4

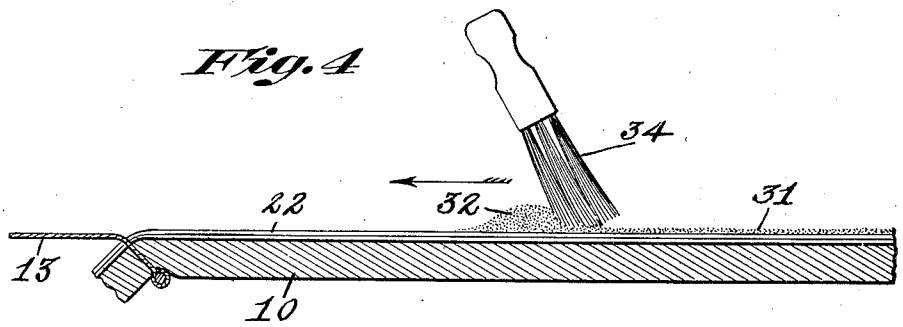


Fig. 5

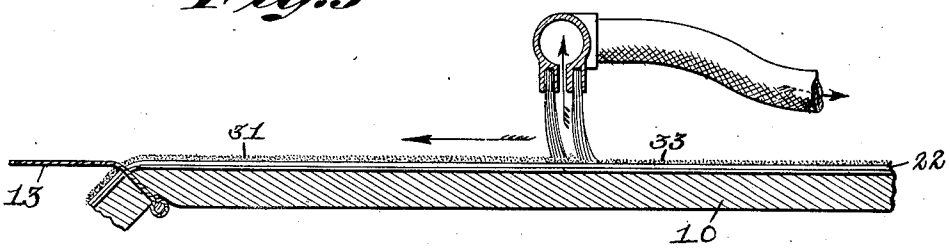


Fig. 6

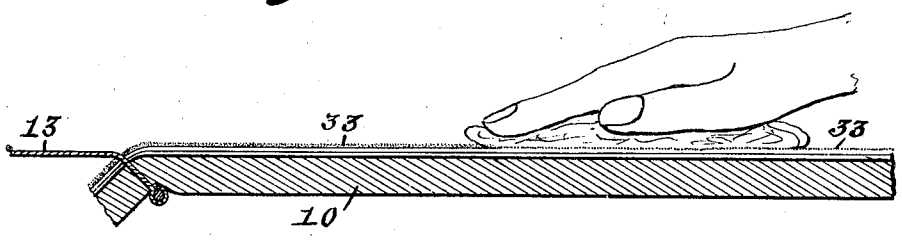
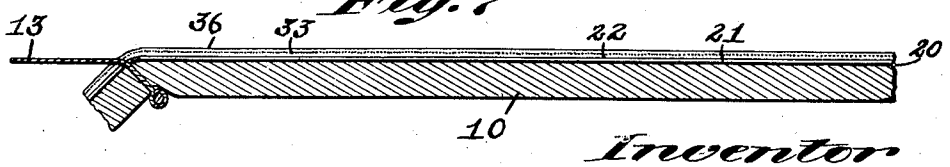


Fig. 7



Inventor
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Patented Jan. 12, 1926. 1,569,056

UNITED STATES PATENT OFFICE.

WILLIAM C. WELCH, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO SNYDER WELCH PROCESS CORPORATION, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

COLORED PATENT LEATHER AND PROCESS OF MAKING THE SAME.

Application filed July 8, 1925. Serial No. 42,173.

To all whom it may concern:

Be it known that I, WILLIAM C. WELCH, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Colored Patent Leather and Processes of Making the Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to colored patent leather and to a method of making the same.

In general the invention has for an object to produce a novel colored patent leather possessing a distinctively novel and highly attractive appearance which is extremely durable and which is sufficiently elastic to enable it to be successfully manufactured into shoes without any more cracking than with ordinary high-grade patent leather. The colored patent leather possesses flexibility and will not peel or deteriorate under severe conditions of usage.

A further object of the invention is to provide a novel, economical and practical method of making colored patent leather.

With these objects in view, the invention consists in the colored patent leather and in the method and novel steps thereof hereinafter described and particularly pointed out in the claims at the end of the specification.

The drawings illustrate the preferred form of the colored patent leather and also some of the steps in the preferred method of its manufacture, and wherein Figure 1 is a plan view of a frame showing a side of leather stretched therein; Fig. 2 is a front elevation of a portion of one of the ovens preferably used for baking the leather in producing the present colored patent leather; Fig. 3 is a sectional view of a portion of the side shown in Fig. 1, illustrating the partially completed leather in a condition preparatory to the application of the coloring material; Fig. 4 is a view similar to Fig. 3 illustrating the manner in which the coloring material is preferably applied; Fig. 5 is a similar view illustrating the preferred manner in which the excess of coloring material is removed; Fig. 6 is a similar view illustrating the polishing or burnishing operation; Fig. 7 is a view similar to Fig. 3, illustrating the completely finished colored patent leather; and Fig. 8 is an enlarged section illustrating the formation of the several layers of material comprising the present colored patent leather.

Prior to the present invention no satisfactory colored patent leather has been produced. A certain amount of so-called pigment finished leather has been heretofore produced in which pigments have been incorporated into a paint vehicle and the resulting paint applied to leather, and in some instances to patent leather. The resulting colored leather has been of a hightly glittering appearance, is unsatisfactory for proper working in the manufacture of shoes wherein the leather is subjected to terrific strains in being pulled over the lasts and in the general construction of the shoes, and furthermore, the durability of such shoes made from such pigment finished patent leather has been unsatisfactory, the pigment operating to some extent to shorten or destroy the elasticity of the coating, and the coating having a tendency to peel and crack.

In accordance with the present invention a colored patent leather is produced having a novel and highly attractive appearance and which may properly be described as having the appearance of a continuous sheet of the coloring material itself. For example, if the coloring material be silver or bronze, then the finished colored patent leather has the appearance of a sheet of the silver or bronze, and when this material is made up into shoes, particularly into ladies' slippers, the slippers or shoes have the appearance of slippers made of the pure coloring material in sheet form.

Referring to the drawing, the tanned leather, preferably in the form of the tanned side 10 in the condition in which it is received from the tanner is first stretched and secured in an open wooden frame 12 by means of toggle strings 13 secured to the different marginal portions of the side and which are tacked to the frame. After the hide has been thus stretched and secured in the frame, it has applied to it, two and preferably three coatings or layers 20, 21, 22, of a material comprising preferably japanner's varnish prepared in a particular way as is

now the common practice in the preparation of this varnish for producing the ordinary patent leather. The first coat or layer 20 applied to the leather is the so-called daub coat, and which is brushed onto the leather and the coating dried, either in the sunlight or by means of artificial drying exactly as is practiced in the production of the best grades of patent leather. After the daub coat has been dried, the second so-called first finishing coat 21 is brushed onto the leather while the latter remains in a tightly stretched condition in the frame, and this first finishing coat 21 may comprise a linseed oil varnish of the composition and prepared in accordance with the standard practice in producing the best grade of patent leather, and which preferably contains pigment corresponding to or harmonizing with the final color to be applied to the leather. After this first finishing coat has been applied, the coated leather stretched in the frame is placed within the usual form of baking oven 30 at present employed in the manufacture of patent leather, and the leather and coatings baked until the coatings become hard, preferably at a temperature of 140° F. The leather is then removed from the oven, then rubbed down with pumice, and a second finishing coat 22 of japanner's varnish applied. This second finishing coat 22 preferably comprises a linseed oil varnish prepared in accordance with the methods at present practiced in preparing the second finishing coat for the production of high-grade patent leather, and is preferably thinned to a less specific gravity of 2°–3° Baumé, and after it has been applied, the leather and frame is returned to the oven and baked. Instead of baking the leather at this stage of the process for the period at present used in the manufacture of ordinary patent leather, it should be baked for a lesser time, so that the varnished surface of the leather may be quite soft and capable of holding the color to be applied. For example, if the second finishing coat or layer 22 is ordinarily baked, depending upon the particular varnish used, at an average temperature of 150° F. for twenty hours, then it is desirable to cut down the time of baking to from 9–10 hours. The baking may be controlled by cutting down the heat and baking for a longer period than 10 hours.

With the exception of the diminished time in which the second finishing coat of the varnished material is baked, the procedure thus far and the materials employed may and preferably will comprise those at present known and used by the patent leather manufacturers in this country in the production of high-grade patent leather, or in other words, in the production of a grade of patent leather which may be successfully utilized in the manufacture of shoes without excessive cracking and which enables shoes when worn to last for relatively long periods of time.

The leather stretched in the wooden frame and having the upper varnished layer 22 incompletely baked, is withdrawn from the oven one piece at a time and placed on a pair of horses or other supporting member in a substantially horizontal position. The color material in powdered form, which may comprise a metallic powder, dry pigment, or dyes in powdered form according to the color which it is desired that the patent leather should assume, is applied over the tacky surface of the finished leather. It is desirable to apply an excess powder so that the whole piece may be completely covered, forming a relatively thick layer 31. In applying the powder, a swab of soft cloth, or a soft brush may be used with advantage, and in order to prevent a streaky appearance in the finished colored patent leather, it is essential for the most satisfactory results that this powder be spread or distributed over the surface of the tacky varnish in a manner such as to prevent the bursh, cloth, or other device from contacting with the sticky surface of the varnish. As represented in Fig. 4, the preferred manner in which the color material is applied comprises the application of a mass or heap 32 of the powdered color material upon the surface of the tacky varnish, and then the distribution of the material into a relatively thick layer by the brush 34 or cloth, the operator pushing the pile or powdered material over the varnished surface in advance of the brush or cloth, so that at no time is the brush brought into direct contact with the sticky varnish. After the powdered color has thus been thoroughly spread, it is well to go over the piece of leather again with the brush, applying a very slight pressure. These details in the operation of applying a layer of powdered color to the incompletely baked and tacky surface of the upper varnish layer 22, are necessary in order that the powder may be forced into sufficient contact with the tacky varnish surface, so that during the subsequent baking operation it may be securely affixed and bonded to the underlying varnish layer. After the powder has been thus applied, the frame and the leather is returned to the oven 30 and baked for a period of not less than nine or ten hours, preferably at a temperature of about 140° F. This baking operation hardens the second finishing coat and securely affixes the individual particles of the powdered material to the varnish layer. After this baking operation has been completed, the frame with the leather tightly stretched therein is removed from the oven, placed upon the horses in a sub-

stantially horizontal position and the excess color carefully and thoroughly removed. It is desirable to remove all of the excess possible with a vacuum having a brush attachment as this enables the unattached color to be recovered and used over again, and in passing the brush over the surface of the leather in the manner illustrated in Fig. 5, the suction not only operates to suck up and withdraw from the surface of the leather all of the loose unattached particles of the powdered color, but also the brushing action over the entire surface of the leather operates to loosen a great deal of the excess material so that there remains upon the surface a very thin layer 33 comprising practically a skin or smear of the color, and all particles of which are firmly anchored in the baked surface of the varnish. The leather in this condition presents an opaque and a dull appearance, and it is desirable that the surface of the leather be burnished to completely blend the particles of the powdered color and to impart to the surface a shiny appearance, the extent of the shine depending upon, to some extent, the character of the powdered color. This may be done by means of a soft cloth in the manner illustrated in Fig. 6.

After the powdered color has been thus applied, baked and preferably burnished, then a layer 36 of transparent japanner's varnish is applied over the surface of the powdered color and the wooden frame with the leather therein is again placed in the oven and baked until the surface coating of varnish has hardened and preferably for the first three hours of baking at a temperature not higher than 110° F. and thereafter at approximately 150° F. until the varnish has become sufficiently dry. This result is ordinarily obtained after a total drying of about twenty hours. After this final baking operation, the leather is withdrawn from the oven and placed in the sunlight for a final drying, exactly as in the ordinary process for producing a high-grade black patent leather. The final transparent varnish is preferably a very light varnish having a gravity of approximately 52° Baumé at 98° F. Such a light varnish is particularly to be employed when the powdered color comprises dyes, pigments or metallic powders of the lighter shades, such as silver. When some of the darker shades of coloring material are employed, a varnish somewhat heavier should be used to impart sufficient luster to the product. Care should be taken in the application of this last varnish coating, as it is desirable that it should be applied lightly without bearing on the brush any more than is necessary.

In applying the final varnish coating, care should be taken, in order to secure the best result, to prevent contamination of the supply of varnish with the coloring material and in order to prevent this contamination I have found by experiment that this final varnish coating may be applied by means of standard spraying apparatus adapted to spray the varnish over the color. The varnished coating produced by the spraying method not only is uncontaminated by the color but also when applied produces a very clear and transparent film entirely free from cloudy effects which are apt to be produced by dislodgment of color particles in brushing.

A simple method for applying the final varnish coating and reducing to a minimum the liability of contamination of the final varnish coating with color consists in dipping the requisite quantity of varnish from the supply and pouring the same onto the leather over the color. The varnish thus applied to the color may be spread by brushing and the brush is never dipped in the supply of varnish. After six sides have been brushed in this manner, the operator quickly rinses his brush in a pail of clean naphtha and the brush is in a condition to be used again. Most all of the naphtha in which the brush is rinsed may, at the end of a day's run, be poured off and utilized again.

The present colored patent leather, it will be observed, is preferably made as to the major portion of the coatings thereof, exactly and of the same materials, as a high-grade black patent leather, so that the final product has imparted to it by these coatings, comprising either the first two or the first three coatings accordingly as the process is operated upon two coating or three coating work, those characteristics of elasticity, toughness, durability and strength so necessary in a patent leather to permit the manufacture therefrom of shoes. As is well known, patent leather when made into shoes is subjected to strains accompanying the pull of the leather over the last which are so great that unless the varnish or japanned coatings are properly prepared and applied and baked upon the leather in a careful manner within predetermined temperature limits the result will be that the coatings will crack during the manufacture of the shoes. As above stated, the present colored patent leather possesses these desirable characteristics of elasticity, durability and strength, and furthermore the powdered color is applied between the upper and next lower japanned coatings in such a manner as to enable a definite bond to be established between the upper and surface coating and the next lower coating between the individual particles of the powdered color. Furthermore, in accordance with the preferred process, the excess and in fact all of the powdered color which may be removed

by energetic brushing is removed, thus leaving only a very thin body of the color. This very thin body of color has no tendency to decrease the flexibility or elasticity of the finished product so that the completed patent leather may be successfully made into shoes or any other wearing apparel or other articles desired.

The coating material for the daub coat and for the finishing coat, or coats, preferably comprises a special japanner's linseed oil boiled in a careful manner and cut with naphtha, in accordance with the standard practice in producing japanner's varnish used for producing high grade patent leather. The details of the manufacture of this material are well known. The coatings on the leather produced by such material are exceedingly elastic and durable and the thin body of powdered color, comprising individual particles anchored in and baked between superimposed layers of coating produced from these special japanner's varnishes, operates to impart to the final product an appearance to the eye of a continuous sheet of the color material and at the same time the porosity and thinness of the color layer enables the adjacent coatings to thoroughly bond together to provide a unitary structure of coating capable of withstanding severe usage for long periods of time without cracking or peeling, an advantage which is directly due to the character of the color layer and the character of the coatings and the fact that during the baking operation the leather is stretched in an open frame, affording an opportunity for the heat to pass upwardly through the leather and to blend and bond the coatings together.

The present colored patent leather is preferably formed by finishing in the manner above described the grained side of the leather and in the finished product the grain is clearly visible, because of the fact that the burnishing operation performed upon the body of coloring material operates to bring out to some extent the grain, and as a result the transparent varnish film over the coloring material serves to emphasize the grained appearance of the colored powdered layer and to impart lustre to the product.

The finished colored patent leather made in accordance with the preferred process above described may be readily distinguished in appearance from leather to which a thin film of paint has been applied, in that the particles of color in the present product under a magnifying glass impart the appearance of very fine stippling, a striking characteristic which is entirely absent from a paint film. Of course the present product being a true patent leather possesses durability and workability not possessed by the painted leathers of the prior art.

While it is preferred to apply three coats to the leather before the application thereto of the powdered color, nevertheless for some purposes it may be advantageous to operate upon the two coat system in applying two coats of japanner's varnish to the leather. Also, in some instances, it may be desirable to utilize cellulose derivatives in connection with the linseed oil base of the varnish coatings, in accordance with the standard practice in the manufacture of japanner's varnish for patent leather work. In some instances it may be desirable to omit the final protective layer 36, although I prefer to employ it as a protection against the tarnishing and deleterious effect of exposing the color layer 33 to the weather.

As used throughout the specification and claims, the term "japanner's varnish" is intended to define those standard varnishes used in the patent leather trade to produce elastic, tough, and durable coatings, capable of being used in the manufacture of shoes.

While the preferred embodiments of the invention have been illustrated and described, it is to be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. In the method of making colored patent leather, the steps comprising applying to the leather successive coatings of japanner's varnish to form patent leather, and applying and firmly affixing in the surface of one of said coatings a thin layer of powdered color to impart to the patent leather the general appearance of a continuous sheet of the color.

2. The method of making colored patent leather, which consists in applying japanner's varnish to the leather to form patent leather, applying and affixing in the surface of the japanner's varnish a thin layer of powdered color to impart to the patent leather the general appearance of a continuous sheet of the color, and thereafter covering said color layer with a transparent protective layer.

3. The method of making colored patent leather, which consists in stretching the leather in an open frame, successively applying and baking coatings of japanner's varnish upon the leather while maintained in a stretched condition in said frame, and applying and firmly affixing a thin layer of powdered color in the surface of the underlying of two of said baked coatings and before the application of the upper of said coatings.

4. The method of making colored patent leather, which consists in stretching the leather in an open frame, applying and

baking successive coatings of japanner's varnish to form patent leather, stopping the baking of the last applied coating to render the surface of the varnish adhesive, applying a thin layer of powdered color over the adhesive varnish, baking the leather thus coated to firmly anchor the color in the varnish, and finally applying and baking a thin layer of transparent japanner's varnish over said layer of color.

5. The method of making colored patent leather, which consists in stretching the leather in an open frame, applying and baking successive coatings of japanner's varnish to form patent leather, stopping the baking of the last applied coating to render the surface of the varnish adhesive, applying a very thin layer of powdered color over the adhesive varnish, baking the leather thus coated to firmly anchor the color in the varnish.

6. The method of making colored patent leather, which consists in stretching the leather in an open frame, applying and baking successive coatings of japanner's varnish to form patent leather, stopping the baking of the last applied coating to render the surface of the varnish adhesive, completely covering the adhesive varnish with an excess of the powdered color, baking the leather in this condition, removing the excess color and leaving upon the leather a very thin layer of the powdered color, the particles of which are firmly anchored in the baked varnish.

7. The method of making colored patent leather, which consists in stretching the leather in an open frame, applying and baking successive coatings of japanner's varnish to form ordinary patent leather, stopping the baking of the last applied coating to render the surface of the varnish adhesive, completely covering the adhesive varnish with an excess of the powdered color, baking the leather in this condition, removing the excess color and leaving upon the leather a very thin layer of the powdered color, the particles of which are firmly anchored in the baked varnish, and thereafter applying and baking a layer of transparent japanner's varnish over said layer of color.

8. The method of making colored patent leather, which consists in stretching the leather in an open frame, applying and baking successive coatings of japanner's varnish to form patent leather, stopping the baking of the last applied coating to render the surface of the varnish adhesive, completely covering the adhesive varnish with an excess of dry powdered color, baking the leather in this condition, removing the excess color and leaving a very thin layer of the color, the individual particles of which are anchored in the baked varnish, then burnishing said color layer, and thereafter applying and baking a layer of transparent japanner's varnish over the layer of color.

9. The method of making colored patent leather, which consists in applying to the leather successive baked coatings of japanner's varnish to form patent leather, terminating the baking of the last applied coat to render the varnish adhesive, forming a thin layer of powdered color upon said adhesive varnish surface, then applying a layer of transparent varnish without contaminating it by powdered color and subsequently baking the leather.

10. As a new article of manufacture, a colored patent leather comprising ordinary patent leather having a thin layer of powdered color firmly affixed on the surface of the coating and a transparent protective layer covering the color layer.

11. As a new article of manufacture, a colored patent leather comprising leather provided with a plurality of superposed hardened coatings of japanner's varnish, and a thin layer of color between two of the varnish coatings.

12. As a new article of manufacture, a colored patent leather comprising leather having the grained surface thereof provided with a plurality of baked coatings of japanner's varnish conforming to the grain, a thin layer of powdered color firmly affixed in the surface of one of the varnish coatings and conforming to some extent to the grain, and a thin coating of baked japanner's varnish over the color.

13. As a new article of manufacture, a colored patent leather comprising ordinary patent leather having a thin layer of color firmly affixed in the upper surface thereof, and a layer of baked transparent japanner's varnish covering said color layer and being itself free from contamination by the color.

14. A colored patent leather comprising leather having a plurality of superposed baked coatings of japanner's varnish, and a layer of color between two of said coatings and comprising small particles imparting to the surface the general appearance of a continuous sheet of the color but presenting under a magnifying glass a characteristic stippled appearance of the large number of individual particles of color.

15. The steps in the herein described method, which consist in applying to patent leather having an adhesive surface, an excess of powdered color, baking the leather with the excess of color thereon, and thereafter removing the excess of color by suction.

16. The steps in the herein described method, which consist in applying to patent leather having an adhesive surface of an incompletely baked coat of japanner's varnish, an excess of powdered color, baking the

leather, removing the excess, and then applying by spraying a thin layer of colorless japanner's varnish.

17. The steps in the herein described method, which consist in applying to patent leather having an adhesive surface of an incompletely baked coat of japanner's varnish, an excess of powdered color, baking the leather, removing the excess, and then applying by spraying a thin layer of colorless japanner's varnish and baking the leather.

18. As a new article of manufacture, a colored patent leather comprising ordinary patent leather having a thin layer of powdered color firmly affixed in the surface thereof, and comprising small particles, imparting to the surface the general appearance of a continuous sheet of the color but presenting under a magnifying glass a characteristic stippled appearance of a large number of individual particles of color.

In testimony whereof I have signed my name to this specification.

WILLIAM C. WELCH.