

2. Upon information and belief, defendant Genosco (d/b/a KleanColor) ("KleanColor") is a California corporation having a place of business at 6190 Valley View Street, Buena Park, California 90620.

JURISDICTION AND VENUE

3. This action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.* This Court has subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

4. Venue is proper in this judicial district under one or more of 28 U.S.C. §§ 1391(b), 1391(c), and 1400(b).

BACKGROUND FACTS

5. Kirker is in the business of manufacturing, marketing, and selling nail polish products, including compositions that are covered by the '590 Patent, which form decorative random cracks after application to nails. Kirker's patented crackle compositions are sold in this judicial district and throughout the United States through various retail stores.

6. Upon information and belief, KleanColor is in the business of marketing and selling, within the United States and within the jurisdiction of this Court, a line of crackle nail polish products under at least the mark *Crack* (see Exh A attached), which also forms random decorative cracks after application to nails.

PATENTS AT ISSUE

7. On August 10, 1999, the United States Patent and Trademark Office duly and legally issued the '590 Patent to Mr. Dominick D. Razzano (now deceased) as legal owner for an invention entitled "Fingernail Lacquer Composition and Method of Application." A copy of the '590 Patent is attached hereto as Exhibit B.

8. Kirker is the exclusive licensee under the '590 Patent, having the right to bring this infringement action pursuant to a written agreement with Mr. Razzano.

9. On October 31, 2000, the United States Patent and Trademark Office duly and legally issued the '822 Patent to Kirker Enterprises, Inc., as legal owner for an invention entitled "Nail Enamel Compositions Having Decorative Appearance." A copy of the '822 Patent is attached hereto as Exhibit C.

FIRST CLAIM FOR RELIEF
Infringement Of The '590 Patent

10. Kirker realleges and incorporates herein the foregoing allegations in paragraphs 1-9, as if set forth in their entirety.

11. Upon information and belief, defendant KleanColor is advertising, marketing, selling, and/or offering for sale, crackle nail polish products under the mark *Crack* within the jurisdiction of this Court.

12. Upon information and belief, the products sold under the mark *Crack* are cosmetic lacquer compositions for application to fingernails and toenails comprising a binder and a pigment.

13. Upon information and belief, the products sold under the mark *Crack* comprise a binder and a pigment, which after application to a nail and after drying, form random cracks in the applied layer.

14. Upon information and belief, after a reasonable opportunity for further investigation or discovery, it is likely that Kirker will develop evidentiary support that KleanColor's crackle nail polish products marketed under the mark *Crack* infringe one or more claims of the '590 Patent, and that said infringement has been done willfully and intentionally.

15. Defendant KleanColor's advertising, marketing, selling, and/or offering to sell its crackle nail polish products that infringe one or more claims of the '590 Patent is a violation of Kirker's statutory rights under the United States Patent Statute (35 U.S.C. §§ 1 *et seq.*).

16. Kirker gave written notice by letter dated April 12, 2011, to KleanColor of Kirker's claim to enforceable patent rights in the United States under the '590 Patent, which cover the crackle nail polish products advertised, marketed, sold, and/or offered for sale by KleanColor under the mark *Crack*.

17. The foregoing acts of patent infringement by defendant KleanColor has caused, and unless enjoined by this Court, will continue to cause, immediate and irreparable injury and damage to Kirker, and Kirker has no adequate remedy at law.

SECOND CLAIM FOR RELIEF
Infringement Of The '822 Patent

18. Kirker realleges and incorporates herein the foregoing allegations in paragraphs 1-17, as if set forth in their entirety.

19. Upon information and belief, defendant KleanColor is advertising, marketing, selling, and/or offering for sale, crackle nail polish products under the mark *Crack* within the jurisdiction of this Court.

20. Upon information and belief, the products sold under the mark *Crack* are cosmetic compositions for application to fingernails and toenails comprising a film forming component in an aqueous medium.

21. Upon information and belief, the products sold under the mark *Crack* comprise a film forming component in an aqueous medium, which after application to a nail and after drying, form random cracks in the applied layer.

22. Upon information and belief, after a reasonable opportunity for further investigation or discovery, it is likely that Kirker will develop evidentiary support that KleanColor's crackle nail polish products marketed under the mark *Crack* infringe one or more claims of the '822 Patent, and that said infringement has been done willfully and intentionally.

23. Defendant KleanColor's advertising, marketing, selling, and/or offering to sell its crackle nail polish products that infringe one or more claims of the '822 Patent is a violation of Kirker's statutory rights under the United States Patent Statute (35 U.S.C. §§ 1 *et seq.*).

24. The foregoing acts of patent infringement by defendant KleanColor has caused, and unless enjoined by this Court, will continue to cause, immediate and irreparable injury and damage to Kirker, and Kirker has no adequate remedy at law.

PRAYER FOR RELIEF

WHEREFORE, Kirker prays for the following relief:

A. For judgment that KleanColor has infringed and is infringing one or more of the claims of the '590 and '822 Patents;

B. For a permanent injunction prohibiting KleanColor, including its officers, agents, employees, and all persons acting in concert or participation with them who receive actual notice of the Court's Order, from committing further acts of infringement, including direct infringement, inducing infringement of, or contributing to the infringement of the '590 and '822 Patents;

C. For an Order directing the destruction of all infringing products in the possession of KleanColor or in the possession of its distributors;

D. For an accounting for damages;

E. For an award of damages for KleanColor's infringement of the '590 and '822 Patents, including lost profits and/or a reasonable royalty, together with interest (both pre and postjudgment), costs and disbursements as fixed by this Court under 35 U.S.C. § 284;

F. For a determination that KleanColor's infringement has been and is willful;

G. For an award of treble the amount of damages and losses sustained by Kirker as a result of KleanColor's infringement under 35 U.S.C. § 284;

H. For a determination that this is an exceptional case within the meaning of 35 U.S.C. § 285;

I. For an award to Kirker of its reasonable attorney fees; and

J. For such other and further relief in law or in equity to which Kirker is justly entitled.

JURY DEMAND

Pursuant to Fed. R. Civ. P. 38(b), Kirker hereby demands a trial by a jury on all issues so triable.

Respectfully submitted,

LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK, LLP
Attorneys for Plaintiff Kirker Enterprises, Inc.

Dated: August 23, 2011

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CERTIFICATION PURSUANT TO LOCAL CIVIL RULE 11.2

The undersigned hereby certifies, pursuant to Local Civil Rule 11.2, that with respect to the matter in controversy herein, there is currently pending before this Court, *Kirker Enterprises, Inc. v. Expression Beauty Works, Inc., De Roblin, Inc. (d/b/a Mia Secret), and Layla Cosmetics S.R.L.*, Civil Action No. 11-2541-FSH-MAH; and *Kirker Enterprises, Inc. v. Max Makeup Cherimoya, Sunna Kim (a/k/a Claire Kim a/k/a Clair Waldorf), Sunna Kim (d/b/a Max Makeup Cherimoya), Jung Ho Yoo (a/k/a Jeffrey Yoo), and Jung Ho Yoo (d/b/a Max Makeup Cherimoya)* Civil Action No. 2:11-cv-03685-FSH-PS, each relating to the '590 patent in controversy.

LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK, LLP
Attorneys for Plaintiff Kirker Enterprises, Inc.

Dated: August 23, 2011

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EXHIBIT A

KLEANCOLOR®

FREE SHIPPING
OVER \$40

PRODUCTS

NEW ARRIVALS

NEWS & EVENTS

SEARCH

SHOPPING CART

Crack NAIL POLISH

Instant Nail Art Effect
Experience the Color Transformation



WHAT'S HOT



NEW SPIN

NEW PRODUCT



MINI NAIL POLISH

FEATURED PRODUCT



Story of NC





Crack Nail Polish

\$3.99 per item

Experience the colorful transformation of KleanColor Crack Nail Polish. Create a stunning nail art effect instantly! Simply apply crack nail polish over your favorite KleanColor nail lacquer and see the magical transformation. These polishes will make you a trendsetter and stand out from the crowd effortlessly.

[Click Here for Instructions](#)

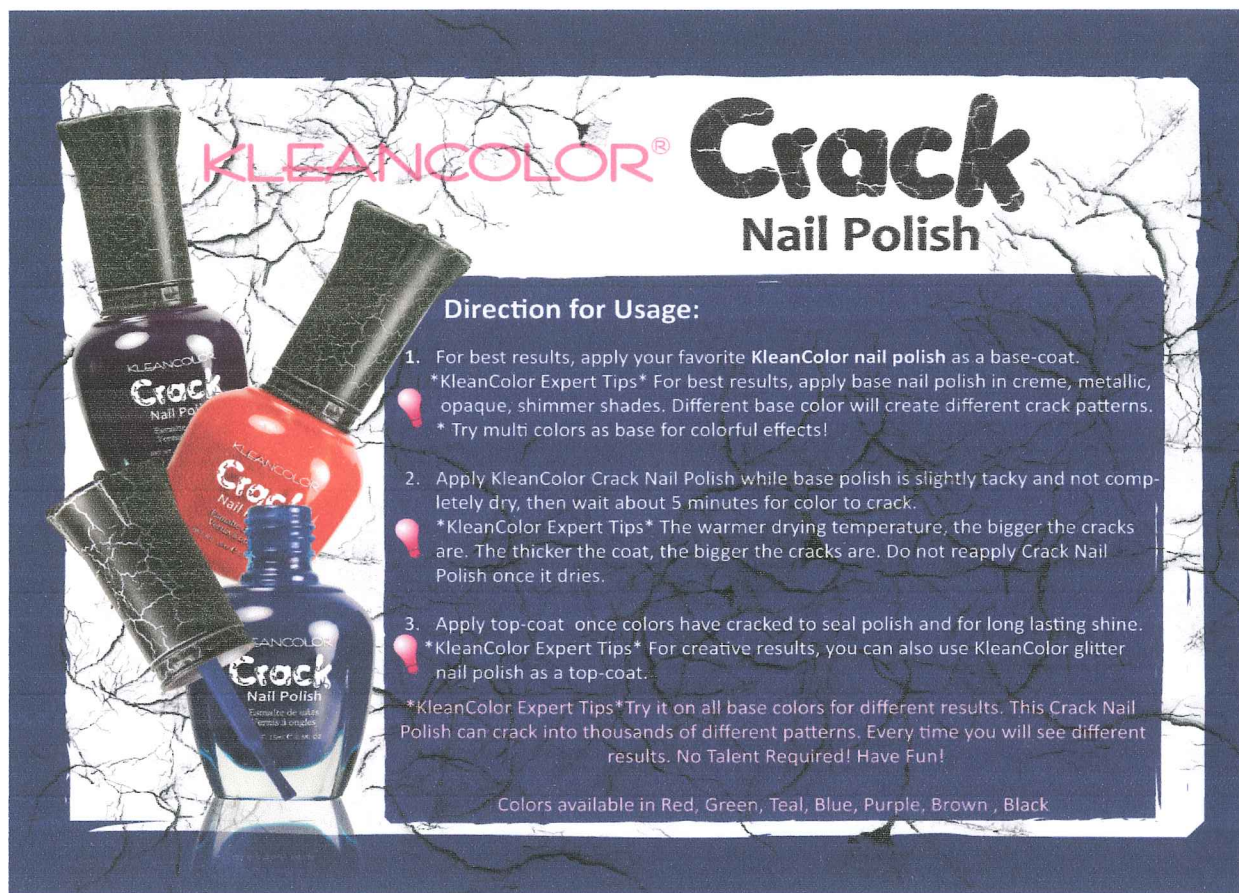
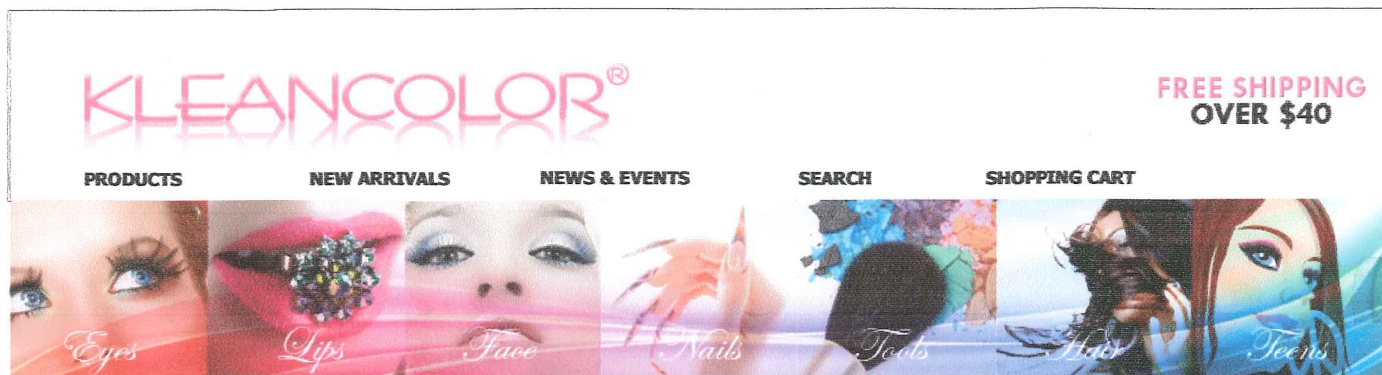


Please select color to view item & cart.



237 Red Crackle





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EXHIBIT B



US005935590A

United States Patent
Razzano

[19]

[11] **Patent Number:** **5,935,590**

[45] **Date of Patent:** **Aug. 10, 1999**

[54] **FINGERNAIL LACQUER COMPOSITION AND METHOD OF APPLICATION**

[76] Inventor: **Dominick D. Razzano**, 5902 NW. 40th Ter., Virginia Gardens, Fla. 33166

[21] Appl. No.: **09/021,652**

[22] Filed: **Feb. 10, 1998**

[51] **Int. Cl.⁶** **A61K 6/00**; A61K 7/00; A61K 7/04

[52] **U.S. Cl.** **424/401**; 424/61

[58] **Field of Search** 424/61, 401

[56] **References Cited**

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Primary Examiner—Thurman K. Page
Assistant Examiner—Sharon Howard
Attorney, Agent, or Firm—Robert M. Downey, P.A.

[57] **ABSTRACT**

The composition includes a pigment and a binder; the pigment being present in a pigment volume concentration of between 69% to 75% of the non-volatile portion of the composition to create a physical action upon drying of a layer of the composition applied to fingernails and toe nails, wherein a lack of cohesive strength between the pigment and binder results in shrinking of the applied layer to form cracks, thereby visibly exposing a previously applied underlying nail polish through the formed cracks.

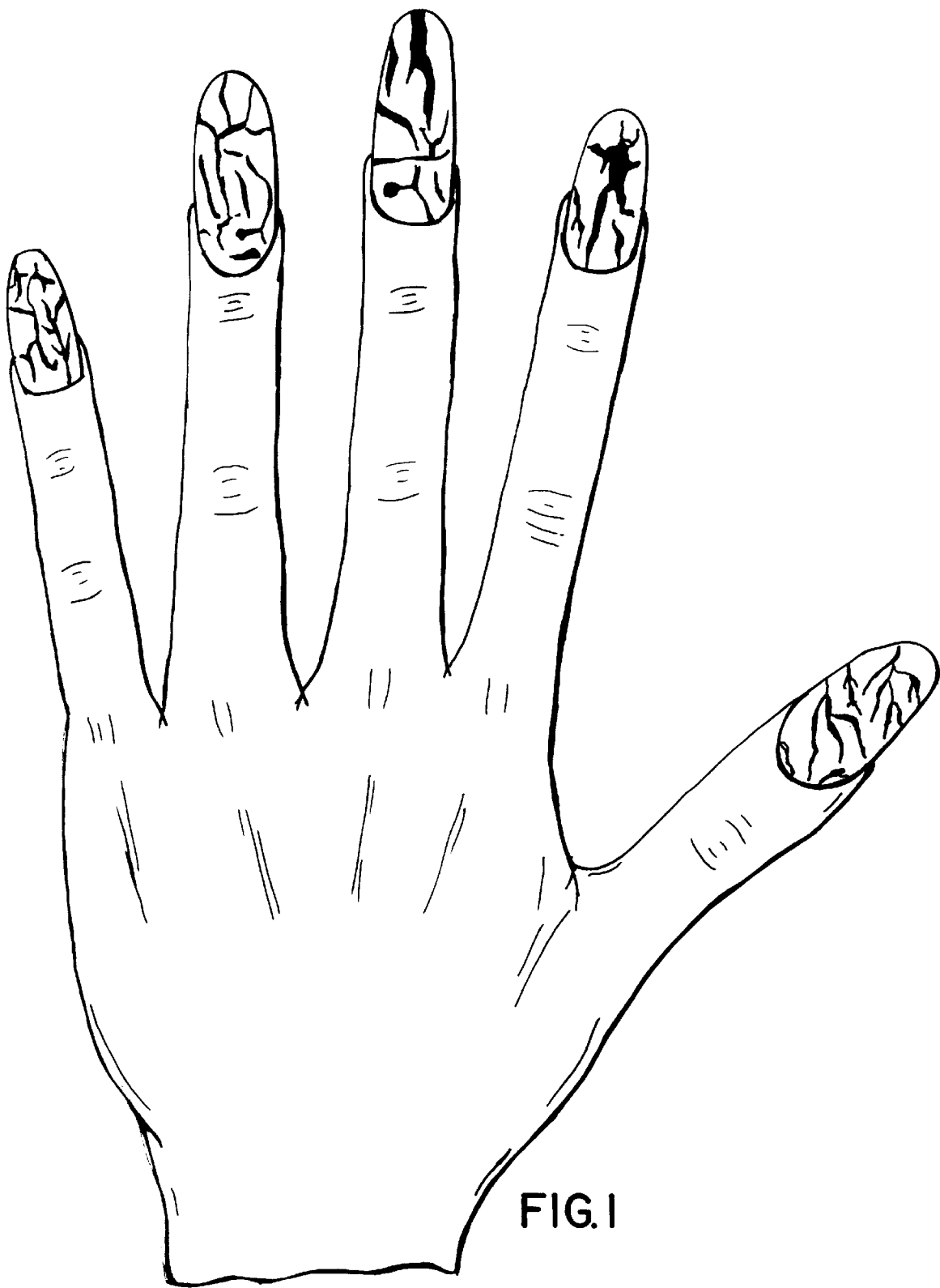
9 Claims, 1 Drawing Sheet



U.S. Patent

Aug. 10, 1999

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**FINGERNAIL LACQUER COMPOSITION
AND METHOD OF APPLICATION**

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a cosmetic preparation and method for applying the preparation to fingernails and toe nails.

2. Description of the Related Art

The art is crowded with various nail polish compositions and methods of applying nail art designs to fingernails. Such methods and compositions are no longer limited to a single, uniform color of nail polish applied to all of one's fingernails or toe nails. It is now commonplace to paint multi-color designs on each nail, sometimes adding sparkles, decals, and other design elements to enhance the overall appearance of the polished nails. This is usually done by airbrushing or free hand painting, both of which require a considerable degree of skill and artistic ability. For this reason, anything beyond conventional polishing of nails with a uniform color must usually be done by a professional at a nail salon.

Now that nail art has gone beyond the traditional single color and french manicure, new and more unusual appearances are becoming increasingly popular. The crackle appearance which results using the composition of the present invention is similar to an appearance known in the furniture industry for creating an antique finish. However, the crackle lacquer used in the furniture industry is not suitable for use in the cosmetic industry, as it contains a number of toxic components which present a health hazard. For this reason, crackle lacquers presently known in the art are not approved by the Food and Drug Administration for use as a cosmetic product. And, while others may have attempted to achieve the crackle effect in a nail polish composition, it is believed that such attempts have been unsuccessful due to the difficulty in producing a non-toxic crackle composition which has physical characteristics that make it suitable for application by both brushing and spraying on fingernails and toe nails.

Accordingly, there is a need in the cosmetic industry for a non-toxic lacquer composition for application to fingernails and toe nails, either by brushing or spraying, and wherein the lacquer composition is physically structured to provide a crackle appearance upon drying. In fulfilling this need, the present invention provides for a non-toxic cosmetic preparation and method of applying the preparation to fingernails and toe nails, wherein the cosmetic preparation is structured to undergo a physical change upon drying to produce a crackle appearance.

SUMMARY OF THE INVENTION

The present invention is directed to a cosmetic preparation and a method of applying the cosmetic preparation to fingernails and toe nails. The cosmetic preparation includes a crackle composition for application to nails which have one or more coats of previously applied conventional colored nail polish thereon. This crackle composition includes a pigment and a binder provided in a ratio to create a physical action upon drying of a layer applied to the nails, wherein a lack of cohesive strength between the pigment and the binder results in shrinking of the applied layer to form cracks therein. The previously applied underlying colored nail polish is thus visible through the cracks formed in the overlying layer of the crackle composition which is of a different color.

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Depending upon the surface quality and chemical composition of the conventional fingernail polish which has been applied before application of the cosmetic preparation of the present invention, it may be necessary to apply a clear coat barrier composition in covering relation to the fingernail polish prior to application of the crackle coat composition. This colorless, transparent base composition can be either brushed or sprayed on the fingernails to provide a layer covering the surface of the fingernail polish. After allowing the base coat to dry for three to five minutes at ambient temperature, the crackle coat composition is applied. The crackle coat composition can be either brushed or sprayed on the nails to provide a uniform layer thereon. Upon air drying for five to ten minutes, cracking of the applied crackle coat occurs and two colors become visible; the color of the crackle coat and the color of the conventional fingernail polish which appears through the cracks of the crackle coat layer.

To obtain a high gloss over the crackle coat, a conventional clear gloss layer can be brushed or sprayed over the crackle coat layer after the crackle coat layer has completely dried. For the highest gloss, two coats of clear gloss lacquer can be applied.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature of the present invention, reference should be made to the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a top plan view of a hand having fingernails treated with the cosmetic preparation of the present invention, wherein each of the nails is shown with a different crackle coat pigment and nail polish color combination to illustrate various appearances achieved using the cosmetic preparation of the present invention.

**DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENT**

The cosmetic preparation of the present invention provides a novel and distinct visual appearance on polished fingernails. In contrast to the one solid color appearance produced by conventional fingernail polish products, the cosmetic preparation of the present invention produces two colors with a randomly created crackle design. More specifically, the top crackle coat appears as one color while a different color of the underlying coat of conventional nail polish is visible through the cracks formed in the top crackle coat, as seen on the fingernails in FIG. 1.

The cosmetic preparation of the present invention is useful in combination with virtually any commercially available fingernail polish. The cosmetic preparation includes two separate compositions which are applied independently of the other by either brushing or spraying. Specifically, the cosmetic preparation includes a clear coat base composition which is applied to the surface of dry colored fingernail polish which has been previously painted on the fingernails or toe nails. The clear coat base composition is applied in a uniform layer by either brushing or spraying over the surface of the polished nails, and allowed to dry for five to ten minutes at ambient temperature.

The cosmetic preparation further includes a crackle coat composition which comprises non-toxic ingredients, including color pigments which are FDA certified for cosmetic purposes. In particular, the liquid or vehicle portion of the crackle coat composition is free from toluol, methyl ethyl ketone, xylol, and formaldehyde. The crackle coat compo-

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sition is applied to the exposed, dry surface of the base coat by either brushing or spraying. The applied layer of the crackle coat should be uniform across the entire upper side of the nails. Upon drying for a period of five to ten minutes at ambient temperature, the applied layer of crackle coat begins to form random cracks, thereby exposing the color of the underlying conventional nail polish. This phenomenon of cracking of the crackle coat layer is a physical reaction which results from over pigmentation. More specifically, the crackle coat composition includes a pigment and a binder which are provided in a ratio that creates a lack of cohesive strength between the pigment and binder. This results in shrinking of the applied layer of the crackle coat composition when drying, thereby creating the desired cracks. Ideally, the pigment is present at a pigment volume concentration (pvc) of between 69% to 75%, wherein the pvc is the percentage of pigment in the non-volatile portion of the formula.

In many instances, the clear coat base composition can be omitted, depending upon the surface quality and chemical composition of the particular fingernail polish which has been previously applied to the nails. However, to ensure a uniform foundation for subsequent coatings, application of the clear coat base composition is generally recommended prior to applying the crackle coat composition.

The following examples are illustrative of compositions of the cosmetic preparation of the present invention.

EXAMPLE 1

A clear coat base composition, comprising petroleum naphtha, n-butyl acetate, ¼ sec nitrocellulose, a plasticizer, propylene glycol methyl ether acetate, and ethyl acetate was prepared with the following ingredients in the indicated concentrations:

Ingredient	Weight	Gallons	Supplier
Petroleum naphtha (VMP)	105.720 lbs.	17.388	Shell Chemical Co. Houston, TX
n-butyl acetate	135.770 lbs.	18.598	Eastman Chemical Kingsport, TN
¼ sec nitro-cellulose (70%)	93.000 lbs.	8.942	Hercules Wilmington, DE
Isopropyl alcohol	21.500 lbs.	3.307	Eastman Chemical Kingsport, TN
2-ethylhexyl diphenyl phosphate (Santicizer 141)	9.500 lbs.	1.044	Monsanto Springfield, MA
#15 Castor Oil	3.000 lbs.	0.350	Cas Chemical Bayonne, NJ
Propylene glycol methyl ether acetate (P.M.A.)	25.800 lbs.	3.108	Dow Chemical Midland, MI
Ethyl acetate	18.770 lbs.	2.536	Eastman Chemical Kingsport, TN
TOTAL	413.060 lbs.	55.273 (1 drum)	

Description: A one drum batch (413 pounds) of the clear coat base composition was prepared in accordance with the following procedure. The ingredients, as listed above, are added, one at a time, in the order presented, beginning with petroleum naphtha. After adding each ingredient, the mixture is stirred until the added ingredient is completely blended with the previously added ingredients. This process of adding and stirring in each ingredient is continued until all ingredients have been completely blended in a homogenous mixture. The resultant mixture is then thinned using butyl acetate and a brushing viscosity of 35 secs. No. 2 Zahn Cup is achieved.

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EXAMPLE 2

A crackle coat composition, in accordance with a preferred embodiment of the present invention, comprises a first mixture portion and a second mixture portion. The pigment in the crackle composition consists of amorphous silica, magnesium silicate (both in the first mixture portion) and a color component (in the second mixture portion) and is present in a preferred pigment volume concentration (pvc) to produce shrinking and cracking of an applied layer of the composition upon drying. The crackle coat composition was prepared with the following ingredients in the indicated concentrations:

Ingredient	Weight	Gallons	Supplier
First Mixture Portion			
n-butyl acetate	42.30 lbs.	5.74	Eastman Chemical Kingsport, TN
Petroleum naphtha (VMP)	21.50 lbs.	3.55	Shell Chemical Co. Houston, TX
70 sec nitro-cellulose (70%)	5.50 lbs.	0.53	Hercules Wilmington, DE
Isopropyl alcohol	11.40 lbs.	1.83	Eastman Chemical Kingsport, TN
Maleated-Rosin (Beckacite 111)	3.80 lbs.	0.42	Arizona Chemical Panama City, FL
Propylene glycol methyl ether acetate (P.M.A.)	7.60 lbs.	0.92	Dow Chemical Midland, MI
Dipropylene glycol methyl ether (D.P.M.)	5.60 lbs.	0.71	Dow Chemical Midland, MI
Mineral spirits	7.10 lbs.	1.09	Shell Chemical Houston, TX
Amorphous silica (OK 412)	4.50 lbs.	0.25	Degussa Corp. Ridgewood, NJ
Magnesium silicate (Vantac 6H)	46.20 lbs.	2.05	R.T. Vanderbilt Norwalk, CT
Ethyl acetate	17.90 lbs.	2.42	Eastman Chemical Kingsport, TN
Second Mixture Portion			
FD&C Blue Al Lake Code 10-21-DB2803 (Color component)	2.73 lbs.	0.34	Hilton Davis Newark, NJ
Maleated-Rosin (Beckacite 111)	2.00 lbs.	0.22	Arizona Chemical Panama City, FL
m-butyl acetate	11.30 lbs.	1.55	Eastman Chemical Kingsport, TN
Acrylic resin (Acryloid B72)	1.06 lbs.	0.11	ROHM & Haas Midland, MI
Dipropylene glycol methyl ether (D.P.M.)	10.00	1.12	Dow Chemical Midland, MI
Ethyl acetate	5.00	0.67	Eastman Chemical Kingsport, TN
TOTAL	205.43 lbs.	23.52	

Description: A 23½ gallon batch of the crackle coat composition can be prepared in accordance with the following procedure. The ingredients of each mixture portion, as listed above, are added, one at a time, in the order presented, beginning with n-butyl acetate. After adding each ingredient, the mixture portion is stirred until the added ingredient is completely blended with the previously added ingredients. This process of adding and stirring in each ingredient is continued until all ingredients have been completely blended to form a homogenous mixture. The first and second mixture portions are then combined and stirred until completely blended, creating a final homogenous composition.

The final composition is thinned using butyl acetate to achieve the desired viscosity. The preferred viscosity for brushing application is 35 secs. No. 2 Zahn Cup. For a spraying viscosity, the composition should be thinned to a viscosity of 20–25 secs. No. 2 Zahn Cup.

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While the above example provides for a blue color component, it is recognized that any FDA certified color component can be used in the pigment mixture.

While the instant invention has been described in accordance with preferred embodiments thereof, it is recognized that departures from the instant disclosure may be made within the spirit and scope of the present invention, and which departures shall not be limited except as set forth in the following claims and under the doctrine of equivalents.

What is claimed is:

1. A cosmetic lacquer composition for application to fingernails and toe nails comprising:

a binder consisting of non-toxic, skin compatible ingredients;

a pigment consisting of non-toxic, skin compatible ingredients; and

the volume of concentration of said pigment in said composition causing the formation of random cracks in a layer of said composition when applied to a surface and upon drying of said applied layer.

2. A lacquer composition for application to fingernails and toe nails comprising:

a first mixture comprising n-butyl acetate, petroleum naphtha, 70 sec nitrocellulose (70%), isopropyl alcohol, maleated-rosin, propylene glycol methyl ether acetate, dipropylene glycol methyl ether, mineral spirits, amorphous silica, magnesium silicate, and ethyl acetate; and

a second mixture comprising color component, maleated-rosin, n-butyl acetate, acrylic resin, dipropylene glycol methyl ether, and ethyl acetate.

3. A lacquer composition as recited in claim 2 wherein a pigment in said composition comprises the color component, amorphous silica, and magnesium silicate.

4. A lacquer composition as recited in claim 3 wherein the pigment is present in a pigment volume concentration of between 69% to 75% of a non-volatile portion of said composition.

5. A cosmetic preparation for application to fingernails and toe nails comprising:

a base composition comprising petroleum naphtha, n-butyl acetate, ¼ sec nitrocellulose (70%), isopropyl alcohol, 2-ethylhexyl diphenyl phosphate, #15 castor oil, propylene glycol methyl ether acetate, and ethyl acetate; and

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a crackle lacquer composition comprising:

a first mixture comprising n-butyl acetate, petroleum naphtha, 70 sec nitrocellulose (70%), isopropyl alcohol, maleated-rosin, propylene glycol methyl ether acetate, dipropylene glycol methyl ether, mineral spirits, amorphous silica, magnesium silicate, and ethyl acetate; and

a second mixture comprising a color component, maleated-rosin, n-butyl acetate, acrylic resin, dipropylene glycol methyl ether, and ethyl acetate.

6. A cosmetic preparation as recited in claim 5 wherein a pigment in said composition comprises the color component, amorphous silica, and magnesium silicate.

7. A cosmetic preparation as recited in claim 6 wherein the pigment is present in a pigment volume concentration of between 69% to 75% of a non-volatile portion of said composition.

8. A method of manufacturing a cosmetic lacquer composition comprising the steps of:

providing a binder portion consisting of non-toxic, skin compatible ingredients;

providing a pigment portion consisting of non-toxic, skin compatible ingredients; and

combining said binder portion and said pigment portion so that said pigment portion is present in a volume of concentration which causes the formation of random cracks in an applied layer of said cosmetic lacquer composition upon drying thereof.

9. A method of decorating fingernails and toe nails comprising the steps of;

providing a cosmetic lacquer composition comprising: a binder portion consisting of non-toxic, skin compatible ingredients;

a pigment portion consisting of non-toxic, skin compatible ingredients;

applying a layer of said cosmetic lacquer composition to a surface on a nail;

drying said applied layer; and

allowing random cracks to form in said applied layer.

* * * * *

EXHIBIT C



US006139822A

United States Patent

Socci et al.

[19]

Patent Number:

6,139,822

Date of Patent:

Oct. 31, 2000

[54] NAIL ENAMEL COMPOSITIONS HAVING DECORATIVE APPEARANCE

[75] Inventors: Robert L. Socci, Cedar Grove, N.J.; Anatoly Ismailer, Roslyn Heights, N.Y.

[73] Assignee: Kirker Enterprises, Inc., Paterson, N.J.

[21] Appl. No.: 09/327,799

[22] Filed: Jun. 8, 1999

Related U.S. Application Data

[60] Provisional application No. 60/088,520, Jun. 8, 1998.

[51] Int. Cl.⁷ A61K 7/04; A61K 7/00; A61K 9/00

[52] U.S. Cl. 424/61; 424/400; 424/401

[58] Field of Search 424/400, 401, 424/61

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Primary Examiner—Shelley A. Dodson

Assistant Examiner—Marina Lamm

Attorney, Agent, or Firm—Lerner, David, Littenberg, Krumholz & Mentlik, LLP

ABSTRACT

A nail enamel composition of non-toxic components forms a decorative irregular film over natural or synthetic human nails. The nail enamel composition includes an aqueous nail enamel composition of at least one film forming component in an aqueous emulsion or dispersion. The film forming component forms the decorative irregular film containing uniform or random cracks upon drying.

47 Claims, No Drawings

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**NAIL ENAMEL COMPOSITIONS HAVING
DECORATIVE APPEARANCE**

The present invention claims the benefit of the U.S. Provisional Application Ser. No. 60/088,520 filed on Jun. 8, 1998, the disclosure of which is incorporated by reference herein.

BACKGROUND OF THE INVENTION

The present invention relates in general to nail enamel compositions, and more particularly, to such compositions which are suitable for coating natural and synthetic nails. Still more particularly, the present invention relates to nail enamel compositions which produce a film having a decorative appearance.

Nail enamel compositions include a class of nail care products regularly used by women as part of their beauty care routine. These nail care products are available in a multitude of product formulations, from clears to infinite colors. Typically, clear nail enamel compositions include a film forming polymer, a film forming resin, a plasticizer and one or more solvents. In the case of a color nail enamel composition, the product may also include a thixotropic compound, a suspending agent and one or more pigments, or in the alternative, an organic coloring polymer may be used. In addition to these components, a number of optional and proprietary components are often included such as UV light absorbers, moisturizers, stabilizers, fragrances and the like.

Nail enamel compositions have heretofore been formulated to satisfy a number of highly desirable film forming properties. For example, desirable properties often include smoothness of application, rapid dry time, scratch resistance, detergent and oil resistance, lustrous appearance, wear and chip resistance and the like. Often most important, it has been highly desirable that the resulting nail enamel film be smooth and uninterrupted by imperfections, for example, orange peel effect, wrinkling, cracking, pitting, bubbling and the like. To this end, nail enamel compositions have included many different types of additives in order to improve the aforementioned desirable properties of the resulting film.

Despite the improved properties of the nail enamel film, the aesthetic or decorative appearance differed very little, except generally for color. Often, manufacturers would produce nail enamel compositions having the same popular colors as their competitors. This provided little distinction between nail enamel products of different manufacturers to the ultimate consumer. Nail enamel compositions having a more decorative appearance were produced by including small pieces of light reflecting decorative material known as glitters within the composition. From the foregoing, it can be appreciated that the appearance of nail enamel compositions have differed very little over the years. To this end, the present invention provides a nail enamel composition which produces a film having a textured decorative appearance heretofore unknown.

Paints and lacquers for furniture and home remodeling applications having an irregular film, for example, a wrinkle or crackle finish have been known for many years. For example, paints and lacquers having a crackle finish are known from Egelhoff, U.S. Pat. No. Re. 16,760; Neuhaus, U.S. Pat. No. 2,021,152; Rees, U.S. Pat. No. 2,350,818; Thacker, et al., U.S. Pat. No. 2,612,456; Hookway, U.S. Pat. No. 2,714,560; and Oates, et al., U.S. Pat. No. 5,601,876. Paints and lacquers having a wrinkle finish are known from Root, U.S. Pat. Nos. 1,689,892 and 1,732,661; Small, U.S.

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Pat. No. 2,248,254; Ficher, U.S. Pat. No. 2,576,290; McBride, U.S. Pat. No. 2,763,568; Neuhaus, et al., U.S. Pat. No. 3,506,474; Kirch, U.S. Pat. No. 3,829,323; and Okamoto, et al., U.S. Pat. No. 4,812,336. These known paints and lacquers are not suitable for human contact due to the inclusion of generally toxic compounds and those which are not approved by the FDA.

Despite these known paints and lacquers, there has heretofore been unknown nail enamel compositions containing non-toxic components which when applied to natural or synthetic nails will produce a film having a textured decorative appearance.

SUMMARY OF THE INVENTION

In accordance with one embodiment of the present invention there is described a nail enamel composition of non-toxic components for forming an irregular film over natural or synthetic human nails, the composition comprising an aqueous nail enamel composition including at least one film forming component in an aqueous emulsion or dispersion, the film forming component forming an irregular film upon drying.

In accordance with another embodiment of the present invention there is described a nail enamel kit of non-toxic components for forming an irregular film over natural or synthetic human nails, the kit comprising a base nail enamel composition including at least one base coat film forming component, the base coat film forming component forming a film over the natural or synthetic nails, and an aqueous nail enamel composition including at least one top coat film forming component in an aqueous emulsion or dispersion, the top coat film forming component forming an irregular film upon drying over the film formed from the base coat film forming component.

In accordance with another embodiment of the present invention there is described a method of forming an irregular film over natural or synthetic human nails, the method comprising applying an aqueous nail enamel composition of non-toxic components including at least one top coat film forming component in an aqueous emulsion or dispersion over the natural or synthetic nails, the top coat film forming component forming an irregular film upon drying.

**DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENTS**

In describing the preferred embodiments of the subject matter to be described, specific terminology will be resorted to for the sake of clarity. However, the invention is not intended to be limited to the specific terms so selected, and is to be understood that each specific term includes all technical equivalence which operate in a similar manner to accomplish a similar purpose.

The present invention broadly discloses nail enamel compositions which, when forming a film therefrom, will exhibit a decorative appearance by virtue of forming an irregular film. By irregular film, it is meant that the film will contain a plurality of cracks in either a uniform or random pattern. The term crack is intended to have its ordinary meaning. For example, a crack is a fissure or complete or partial split, break or fine lines in the nail enamel film so as to produce, for example, slight or narrow spaces or voids. A pseudocrack is also contemplated wherein a thinning of the nail enamel film occurs to produce the appearance of a crack. The cracks may be of uniform or random patterns formed over the natural or synthetic nail which are produced during drying of the nail enamel composition.

The nail enamel compositions of the present invention which produce an irregular film are applied to natural or synthetic nails which have been previously coated with a base nail enamel composition. It is contemplated that four operative nail enamel coating systems can be produced for creating an irregular film in accordance with the present invention. These systems are classified as to whether the nail enamel composition is based upon an organic solvent or an aqueous medium for forming an emulsion or dispersion such as a colloidal dispersion of the film forming components. Specifically, the four systems include (1) a solvent base coat composition for receiving a solvent top coat composition which forms an irregular film, (2) an aqueous base coat composition for receiving an aqueous top coat composition which forms an irregular film, (3) a solvent base coat composition for receiving an aqueous top coat composition which forms an irregular film and (4) an aqueous base coat composition for receiving a solvent top coat composition which forms an irregular film. For purposes of the present application, a base nail enamel composition or base composition will refer to the composition which is applied directly to the natural or synthetic nail. On the other hand, a decorative nail enamel composition or decorative composition refers to the nail enamel composition which forms the irregular film having cracks pursuant to the present invention.

Solvent base coat compositions can be formulated as a clear or color nail enamel composition which is suitable for coating natural and synthetic nails. Typically, a clear nail enamel composition contains one or more film forming components, a plasticizer and one or more solvents. In the case of a color base coat nail enamel composition, the composition will generally include a thixotropic compound, a suspending agent and one or more pigments, or in the alternative, an organic coloring polymer may be used. In addition to these compounds, a number of optionally and proprietary components may be included such as UV light absorbers, moisturizers, stabilizers, fragrances and the like. Suitable solvent base coat nail enamel compositions are disclosed in U.S. patent application Ser. No. 09/056,111, entitled Quick Drying Nail Enamel Composition, filed on Apr. 7, 1998 in the name of Socci, et al.; U.S. Pat. No. 5,863,523, entitled Nail Enamel Composition, filed on Dec. 10, 1996 in the name of Socci, et al.; and U.S. Pat. No. 5,792,447, entitled Nail Enamel Composition, filed on Nov. 15, 1996 in the name of Socci, et al., which application and patents are assigned to the same assignee of the present application, the disclosures of which are incorporated herein by reference.

The solvent base coat nail enamel compositions may contain one or more film forming components such as film forming polymers, for example, cellulose acetate, cellulose acetate butyrate, ethyl cellulose, vinyl polymers, nitrocellulose, as well as methacrylate and acrylate type polymers, and mixtures thereof. Nitrocellulose provides an unusual combination of properties of toughness, durability, solubility and solvent release. Examples of nitrocellulose are the so called nitrocellulose RS $\frac{1}{8}$ sec. and $\frac{1}{4}$ sec.; nitrocellulose RS $\frac{1}{2}$ sec.; and nitrocellulose RS 5-6 sec. and 60-80 sec., which have higher viscosities than the earlier grades. The term "RS" refers to the brand of nitrocellulose with a nitrogen content of about 11.2-12.8% with solubility in esters, ketones and glycol ethers manufactured by Hercules, Inc. The terms $\frac{1}{8}$ sec., $\frac{1}{4}$ sec., $\frac{1}{2}$ sec., 5-6 sec., etc. represent viscosity and refer to the time it takes for a ball to fall to a given depth in the material. Nitrocellulose is typically supplied in 70% concentrations, wet with 30% ethyl or isopro-

pyl alcohol. As used in the present application, the percentage of nitrocellulose in a given composition will be on a wet basis unless otherwise stated. Nail enamel compositions of the present invention may include the above film forming polymers and combinations thereof in an amount ranging from about 5 to 25% by weight, and more preferably in the range of about 10 to 15% by weight.

In addition to the aforementioned film forming polymers, the solvent base coat nail enamel compositions can also include one or more film forming resins. Exemplary film forming resins which may be used in the present invention either alone or in combination with the film forming polymers include, for example, drying and non-drying alkyd resins, polyvinyl resins for example polyvinyl acetate, polyester resins, epoxy resins, acrylic polymers and copolymers, maleic modified glycerol esters of rosin, and toluene sulfonamide/epoxy resins, e.g., tosylamide epoxy resin. It is also within the scope of the solvent base coat compositions of the present invention to include aldehyde condensation products such as arylsulfonamide formaldehyde resins, specifically toluene sulfonamide formaldehyde resin which is a condensation product of formaldehyde and toluene sulfonamide. The amount of film forming resin and combinations thereof can range from about 2 to 25% by weight of the composition, and preferably about 7 to 12% by weight of the composition. Overall, the solvent base coat nail enamel composition can include a number of film forming components in the overall range of from about 2 to 25% by weight of the composition, and preferably about 10 to 15% by weight of the composition.

In addition to the film forming components, the solvent base coat nail enamel compositions according to the present invention will generally include at least one plasticizer to soften and plasticize particularly the film forming polymer. The plasticizer may be in either liquid or solid form, as well as combinations thereof. The solvent base coat compositions may include one or more of the known plasticizers which are suitable for use in nail enamel compositions. Examples of such known plasticizers include tricresyl phosphate, dibutyl tartrate, benzyl benzoate, tributyl phosphate, butyl acetyl ricinoleate, butyl glycolate, butyl stearate, triphenyl phosphate, triethyl citrate, camphor, castor oil, esters of citric, stearate, phalic, oleic, phosphate, butyric and benzoic acid, glyceryl triacetate and glyceryl tripropionate, 2,2,4-trimethyl-1,3-pentandiol diisobutyrate and mixtures thereof. The solvent base coat nail enamel compositions of the present invention also contemplate the use of phthalate type plasticizers either alone or in combination with the aforementioned plasticizers, for example, diamylphthalate, dibutyl phthalate, diethyl phthalate, dioctyl phthalate, dibutoxy ethylphthalate and mixtures thereof.

Plasticizers included in the solvent base coat compositions of the present invention are in amounts sufficient to provide acceptable flexibility to the nail enamel film on the human or synthetic nail surface. In this regard, the amount of plasticizer and combinations thereof for use in the solvent base coat compositions of the present invention range from about 1 to 20% by weight, and preferably about 5 to 10% by weight.

The solvent base coat nail enamel compositions of the present invention also include one or more organic solvents such as those generally used in conventional nail enamel compositions. Examples of these solvents include ethyl acetate, methyl acetate, ethanol, isopropanol, propyl acetate, n-butanol, xylene, DI acetone alcohol, aromatic (containing phenyl groups), amyl acetate, ethers, ketones, alkanes for example, pentane, cyclopentane, hexane, toluene, heptane,

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cyclohexane, cyclic ethers for example, tetrahydrofuran and 1,4-dioxane, cellosolve, butyl cellosolve acetate, cellosolve acetate, methyl cellosolve acetate, butyl cellosolve, ethyl cellosolve, phenylated solvents for example, xylene, esters of acetic acid for example, methyl acetate, ethyl acetate, n-butyl acetate, chlorinated hydrocarbons for example, methylene chloride, chloroform and methylchloroform. The aforementioned solvents can be used alone or in mixtures thereof. In general, the amount of solvent used in the compositions of the present invention range from about 60 to 80% by weight, and preferably about 65 to 75% by weight.

In color solvent base coat compositions according to the present invention, one or more pigments and a suspending agent may also be added. One or more known organic colorants which are well known in the nail enamel art may also be added to these compositions. Pigments are added to the composition to provide cosmetically acceptable shades and to pacify the films. Pigments for use in the present invention may include any of those pigments which are generally known for use in nail enamel compositions. For example, these pigments can include cosmetic grade or purified titanium dioxide, yellow and red iron oxides, bismuth oxychloride, iron blue, iron black, mica particles, ultramarine blue, D&C Red #7, chromide oxide greens, carbon black, lampblack and the like. Other pigments which may be used in compositions according to the present invention may include the Lake pigments, for example, D&C Red #6 barium Lake, D&C Red #7 calcium Lake and the like.

In addition to the above named pigments, there may also be included titanated micas, polyethylene teraphthalates and pearl essence which is a suspension of crystalline guanine in nitrocellulose and solvents, as well as other additives which will affect the appearance of the pigment. Although the amount of pigment in the compositions of the present invention will vary as a function of the type of pigment and other components included in the composition, in general, pigments can be included in an amount up to about 10% by weight of the nail enamel composition.

When pigments are included in compositions according to the present invention, it is useful to include a suspending agent for enhancing the suspension of the pigments in the other components of the solvent base coat composition. Although a number of suspending agents which are generally used in conventional nail enamel compositions may be used to produce compositions according to the present invention, preferred suspending agents include colloidal clays, montmorillonite clays, especially stearalkonium hectorite, stearalkonium bentonite, fumed silica, and mixtures thereof. The suspending agent is present in the compositions of the present invention in amounts sufficient to produce a gel, preferably a colloidal gel. In general, the suspending agent is included in the amount ranging from about 0.5 to 5% by weight of the solvent base coat nail enamel composition.

In addition to the above described components, the solvent base coat compositions of the present invention may also include additional additives including stabilizers, thixotropic agents, light absorbers such as ectocrylene and benzophenone-1, fragrances, moisturizers and medicants, depending on the intended result. These components are well known in the art and may be included in amounts well within the teachings of the prior art.

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The solvent base coat nail enamel compositions in accordance with the present invention can be manufactured by thoroughly and intimately mixing together all the components in the amounts described in accordance with the present invention. Examples of satisfactory equipment and how to use then are readily apparent to one of ordinary skill in the nail enamel art.

The following examples illustrate solvent base coat nail enamel compositions of the present invention. These examples are by way of illustration and are not intended to be limiting the present invention either as to the inclusion of a lesser number of components, the substitution of additional components or variations in the percentages of the range of components.

EXAMPLE 1

WT/PERCENT	
ETHYL ACETATE	43.60
BUTYL ACETATE	12.40
NITROCELLULOSE	12.00
ISOPROPYL ALCOHOL	5.50
TOSYLAMIDE EPOXY RESIN	6.50
SUCROSE ACETATE ISOBUTYRATE	5.00
R779 ACRYLATES COPOLYMER	3.75
TRIPHENYL PHOSPHATE	3.75
POLYESTER RESIN	0.75
DIBUTYL PHTHALATE	0.50
DIACETONE ALCOHOL	0.50
BENZOPHENONE 1	0.10
POLYETHER MODIFIED DIMETHYLPOLYSILOXANE	0.50
DIMETHICONE	0.20
STEARALKONIUM HECTORITE	1.00
TITANIUM DIOXIDE	1.00
D&C RED #6 CALCIUM LAKE	.75
RED IRON OXIDE	1.00
BLACK IRON OXIDE	.20
MICA	1.00

EXAMPLE 2

WT/PERCENT	
ETHYL ACETATE	37.01
BUTYL ACETATE	14.20
NITROCELLULOSE	12.80
ISOPROPYL ALCOHOL	6.40
TOSYLAMIDE EPOXY RESIN	6.60
SUCROSE ACETATE ISOBUTYRATE	5.90
ACRYLATES COPOLYMER	0.70
TRIPHENYL PHOSPHATE	2.70
POLYESTER RESIN	1.20
DIBUTYL PHTHALATE	0.90
CAMPHOR	0.10
HEPTANE	0.30
PROPYL ACETATE	0.20
STEARALKONIUM HECTORITE	0.10
STEARALKONIUM BENTONITE	1.10
DIACETONE ALCOHOL	0.70
BENZOPHENONE 1	0.30
POLYETHER MODIFIED DIMETHYLPOLYSILOXANE	0.40
ETOCRYLENE	0.05
DIMETHICONE	0.10
TITANIUM DIOXIDE	0.20
FD&C YELLOW #5 ALUMINUM LAKE	1.00
FERRIC AMMONIUM FERROCYANIDE	0.04
MICA	7.00

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EXAMPLE 3	
	WT/PERCENT
ETHYL ACETATE	41.20
BUTYL ACETATE	15.80
NITROCELLULOSE	11.50
ISOPROPYL ALCOHOL	6.40
TOSYLAMIDE EPOXY RESIN	6.60
SUCROSE ACETATE ISOBUTYRATE	5.90
ACRYLATES COPOLYMER	0.70
TRIPHENYL PHOSPHATE	2.90
POLYESTER RESIN	0.60
DIBUTYL PHTHALATE	1.70
CAMPHOR	0.20
HEPTANE	0.50
PROPYL ACETATE	0.50
STEARALKONIUM HECTORITE	0.10
STEARALKONIUM BENTONITE	0.80
DIACETONE ALCOHOL	0.50
BENZOPHENONE 1	0.05
POLYETHER MODIFIED	0.40
DIMETHYL POLYSILOXANE	
ETOCRYLENE	0.05
DIMETHICONE	0.10
TITANIUM DIOXIDE	2.00
FD&C YELLOW #5 ALUMINUM LAKE	0.10
RED IRON OXIDE	0.10
BLACK IRON OXIDE	1.30

EXAMPLE 4	
	WT/PERCENT
POLYESTER RESIN	8.40
TOSYLAMIDE EPOXY RESIN	4.96
NITROCELLULOSE 1/4/5-6 sec.	8.87 (dry)
ETHYL ACETATE	30.00
BUTYL ACETATE	27.18
ISOPROPYL ALCOHOL	11.22
TRIPHENYL PHOSPHATE	4.62
2,2,4-TRIMETHYL-1,3-PENTANEDIOL	.85
DIISOBUTYRATE	
DIBUTYL PHTHALATE	.50
CAMPHOR	.10
DIACETONE ALCOHOL	.68
CITRIC ACID	0.02
STEARALKONIUM HECTORITE	.25
STEARALKONIUM BENTONITE	.78
D & C RED #6 BARIUM LAKE	.90
D & C RED #7 CALCIUM LAKE	.35
TITANIUM DIOXIDE	.32

EXAMPLE 5	
	WT/PERCENT
NITROCELLULOSE 1/4/1/2 sec.	12.52 (dry)
TOLUENE SULFONAMIDE FORMALDEHYDE RESIN	8.12
BUTYL ACETATE	22.79
ETHYL ACETATE	18.74
TOLUENE	19.69
ISOPROPYL ALCOHOL	5.72
CAMPHOR	1.10
BENZOPHENONE 1	0.04
DIBUTYL PHTHALATE	5.92
DIACETONE ALCOHOL	.84
STEARALKONIUM HECTORITE	.05
STEARALKONIUM BENTONITE	1.24

-continued	
EXAMPLE 5	
	WT/PERCENT
CITRIC ACID	0.02
POLYESTER RESIN	1.07
TOLUENE SULFONAMIDE EPOXY	0.15
TITANIUM DIOXIDE	.33
D & C RED #6 BARIUM LAKE	.90
D & C RED #7 CALCIUM LAKE	.76

EXAMPLE 6	
	WT/PERCENT
POLYESTER RESIN	5.60
TOSYLAMIDE EPOXY RESIN	4.95
NITROCELLULOSE 1/4/5-6 sec.	8.85 (dry)
ETHYL ACETATE	32.50
BUTYL ACETATE	26.50
ISOPROPYL ALCOHOL	11.50
TRIPHENYL PHOSPHATE	4.65
2,2,4-TRIMETHYL-1,3-PENTANEDIOL	.92
DIISOBUTYRATE	
DIBUTYL PHTHALATE	.50
CAMPHOR	.10
DIACETONE ALCOHOL	.68
CITRIC ACID	0.02
STEARALKONIUM HECTORITE	.25
STEARALKONIUM BENTONITE	.75
TITANIUM DIOXIDE	1.16
IRON OXIDES	.27
D & C RED #7	.20
ETOCRYLENE	.50
MICA	.10

EXAMPLE 7	
	WT/PERCENT
NITROCELLULOSE 1/4/1/2 sec.	12.57 (dry)
POLYESTER RESIN	8.10
TOLUENSULFONAMIDE EPOXY RESIN	.35
ETHYL ACETATE	30.39
BUTYL ACETATE	16.75
BUTYL ALCOHOL	1.71
PROPYL ACETATE	9.44
ISOPROPYL ALCOHOL	9.74
DIBUTYL PHTHALATE	6.19
CAMPHOR	1.10
DIACETONE ALCOHOL	.66
STEARALKONIUM BENTONITE	1.01
STEARALKONIUM HECTORITE	.02
ETOCRYLENE	.50
BENZOPHENONE 1	0.08
CITRIC ACID	0.02
TITANATED MICA	0.12
TITANIUM DIOXIDE	1.00
D & C RED #6 BARIUM LAKE	.05
IRON OXIDES	.10
D & C RED #7 CALCIUM LAKE	.10

Aqueous base coat nail enamel compositions contain one or more aqueous emulsion or dispersion polymers which include copolymers which are suitable for forming an adherent film to a natural or synthetic nail. By way of example, these aqueous polymers include the general class of acrylic polymers, such as styrenated acrylic polymers capable of forming colloidal dispersions and emulsions, polyurethane

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and polyurethane copolymers, vinyl acetate polymers and copolymers, olefin polymers and copolymers, those noted hereinafter with respect to the aqueous decorative nail enamel compositions and the like. Other suitable aqueous polymers are disclosed in Myers, et al., U.S. Pat. No. 5,266,322 which discloses a first aqueous emulsion containing a sulfopolyester and a copolymer of vinyl acetate and dialkyl maleate and a second aqueous emulsion which contains acetoacetoxy-ethyl alkylacrylate, or the reaction product of acetoacetoxy-ethyl alkylacrylate with a vinyl functional monomer; and Green, et al., U.S. Pat. No. 4,158,053 which discloses aqueous emulsion copolymers having a solid content of from about 30–55% and a glass transition temperature within the range of about –10–50° C., which is prepared by the polymerization of two or more specific types of disclosed monomers. The polymers and copolymers disclosed in Myers, et al. and Green, et al. are incorporated herein by reference.

By way of example, styrenated acrylic emulsion polymers suitable for use in an aqueous base coat nail enamel composition are obtainable from S.C. Johnson Polymer, a division of S.C. Johnson Commercial Markets, Inc. of Sturtebant, Wis. under the marks Joncryl 1907, Joncryl 1908 and Joncryl 2561. Joncryl 1907 is supplied as an emulsion containing 46% non volatiles by weight, a viscosity of 500 cps with a glass transition temperature Tg of 21° C. Joncryl 1908 is supplied as an emulsion containing 48% by weight non volatiles having a viscosity of 500 cps and a glass transition temperature Tg of 95° C. and Joncryl 2561 is supplied as an emulsion containing 48% by weight non volatiles having a viscosity of 700 cps and a glass transition temperature Tg of –11° C. The aqueous base coat nail enamel composition of the present invention may include aqueous polymers and copolymers, based on an emulsion or dispersion and combinations thereof in an amount ranging up to 100% of the composition.

In addition to the aforementioned aqueous polymers, the aqueous base coat nail enamel compositions can include one or more coalescing solvents which facilitates the aqueous polymer to form a continuous polymer film. Exemplary coalescing solvents which may be used in the present invention either alone or in combination include, for example, glycol ethers, such as ethylene glycol monobutyl ether, diethylene glycol monomethyl ether, propylene glycol monomethyl ether, dipropylene glycol monomethyl ether, isopropyl alcohol, butyl carbitol, ethylene glycol 2-ethyl hexyl ether, ethylene glycol phenyl ether, diethylene glycol monopropyl ether, diethylene glycol monohexyl ether, diethylene glycol monobutyl, propylene glycol monopropyl ether, propylene glycol tertiary butyl ether, dipropylene glycol monopropyl ether, dipropylene glycol tertiary butyl ether, dipropylene glycol monobutyl ether, tripropylene glycol methyl ether, aromatic based glycol ether, 2,2,4-trimethyl-1,3-pentandiol monoisobutyrate, benzyl alcohol, n-methyl pyrrolidone, diacetone alcohol, exxate 700, exxate 800, exxate 900, exxate 1000, exxate 1300 and mixtures thereof. The aqueous base coat compositions of the present invention may include coalescing solvents and combinations thereof in an amount ranging from about 1 to 20% by weight, and more preferably, in the range of about 5 to 10% by weight of the composition.

The aqueous base coat compositions of the present invention may also include additional additives, including colorants such as pigments and organic colorants such as tints and dyes, dispersing agents, wetting agents, thickeners, suspending agents, anti-foams, buffers, chelating agents, anti-freezing agents, UV light absorbing agents, stabilizers,

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fillers, etc. The selection of these optional ingredients is well within the skill of those familiar with the nail enamel art.

By way of example only, any of the aforementioned pigments or organic colorants may be used in an aqueous base coat nail enamel composition to impart color if desired. Suitable pigments by way of one example only are available as an aqueous dispersion containing styrene acrylic resin from Sun Chemical Corporation of Cincinnati, Ohio. Organic colors referred to as tints are available from Penn Color of Doylestown, Pa. In addition, suspending agents as noted herein may be used to prevent separation and settling of pigmented aqueous base coat compositions.

The aqueous base coat nail enamel compositions in accordance with the present invention can be manufactured in a similar manner as previously noted by thoroughly and intermittently mixing together all of the components in the amounts described in accordance with the present invention. The following examples are provided to illustrate suitable aqueous base coat compositions which are capable of forming a continuous film at room temperature. These examples are by way of illustration and are not intended to be limiting the present invention either as to the inclusion of a lesser number of components, the substitution of additional components or variations in the percentages of the range of components.

WT/PERCENT	
JONCRYL 1908	67.00
JONCRYL 1907	20.00
ISOPROPYL ALCOHOL	3.50
TERTIARY BUTYL ETHER PROPYLENE GLYCOL	3.00
DIBUTYL PHTHALATE	3.50
WATER	3.00

WT/PERCENT	
JONCRYL 1907	91.00
ISOPROPYL ALCOHOL	6.50
DIBUTYL PHTHALATE	2.50

WT/PERCENT	
COMPOSITION OF EXAMPLE 8	97.08
PIGMENT DISPERSIONS: WATER/STYRENE-ACRYLIC RESIN	2.92

WT/PERCENT	
JONCRYL 1907	90.00
TERTIARY BUTYL ETHER PROPYLENE GLYCOL	4.2
ISOPROPYL ALCOHOL	2.5
PENN COLOR SOLUTION 365282	3.3

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WT/PERCENT	
JONCRYL SCX-1970	90.00
ISOPROPYL ALCOHOL	2.5
BUTYL CELLOSOLVE	5.0
PENN COLOR SOLUTION 365282	3.5

A solvent decorative nail enamel composition in accordance with the present invention which evidences cracking upon drying can be formulated for application over either a solvent or aqueous base nail enamel composition of the types previously described. In formulating solvent decorative compositions, the composition generally contains a low percentage of film forming components, i.e., binders, and a high percentage of inert material as fillers. Suitable inert material include, for example, pigments, talc, hydrated silica, zinc stearate, colloidal clays, micas, bismuth oxychloride, fumed silica and the like, as well as mixtures thereof. Any suitable inert material which will provide the solvent decorative composition with a high percentage of solids are contemplated as suitable for use in accordance with the present invention. Solvent decorative nail enamel compositions of the present invention may include inert material in an amount ranging from about 5 to 70% by weight, and more preferably in the range of about 30 to 40% by weight of composition. It is to be noted that the pigments can be selected to provide the desired color to the resulting film which may also include organic colorants.

In order to provide an adherent film from the film forming components, the amount of inert material present should generally be less than the critical pigment volume concentration. This concentration is defined as the level of inert material where the film forming component just surrounds each pigment particle without the pigments touching one another. In the event there is insufficient amount of film forming components, the pigments will touch each other which will provide a brittle or non-cohesive film, i.e., the concentration of inert material being greater than the critical pigment volume concentration. It is to be noted that the critical pigment volume concentration will vary from pigment to pigment and from binder to binder. The specific critical pigment binder concentration for any particular pigment/binder system can be obtained by trial and error and is considered within the knowledge of those skilled in the nail enamel art.

The solvent decorative nail enamel composition includes a relatively low percentage of film forming component which functions as a binder for the pigments or inert material. Any of the aforementioned solvent film forming components, for example, nitrocellulose, cellulose acetate butylate and the like may be used in the composition. The solvent decorative compositions of the present invention may include the film forming components and combinations thereof in an amount ranging from about 5 to 25% by weight, and more preferably, in the range of about 5 to 10% by weight of the composition.

In addition to the above described components, the solvent decorative nail enamel compositions of the present invention will also include one or more of the aforementioned solvents which may be present in the range of about 30 to 90% by weight, and preferably, about 60 to 75% by weight of the composition. Additional components may include one or more of the above-mentioned plasticizers, suspending agents, stabilizers, UV light absorbers, fragrances, moisturizers, medicants, etc., depending upon the intended result.

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The following examples of solvent decorative nail enamel compositions in accordance with the present invention are presented by way of illustration only. These examples are by way of illustration and are not intended to be limiting the present invention either as to the inclusion of a lesser number of components, the substitution of additional components or variations in the percentages of the range of components.

WT/PERCENT	
NITROCELLULOSE 1/4 sec.	2.50(dry)
FUMED SILICA	7.60
BUTYL ACETATE	30.00
ETHYL ACETATE	42.60
ETHANOL	16.20
ISOPROPYL ALCOHOL	1.10

WT/PERCENT	
COMPOSITION OF EXAMPLE 14	85.71
WHITE PIGMENT	14.29

WT/PERCENT	
<u>PASTE COMPOSITION:</u>	
ETHYL ACETATE	75.00
NITROCELLULOSE 1/4 sec.	5.00 (dry)
HYDRATED SILICA	20.00
<u>SOLVENT DECORATIVE COMPOSITION:</u>	
PASTE COMPOSITION OF EXAMPLE 16	30 parts
COMMERCIAL TOLUENE FORMALDEHYDE	15 parts
FREE NAIL ENAMEL #Ver 1033	

WT/PERCENT	
NITROCELLULOSE 1/4 sec.	2.50 (dry)
TITANIUM DIOXIDE	40.00
BUTYL ACETATE	20.00
ETHYL ACETATE	34.40
ETHANOL	4.00
ISOPROPYL ALCOHOL	1.10

Aqueous decorative nail enamel compositions may include one or more of the aforementioned aqueous polymers and copolymers which may be in the form of either an aqueous emulsion or dispersion, such as a colloidal dispersion. In particular, by way of example only, suitable aqueous polymers include those referred to as acrylic polymers, styrenated acrylic polymers, acrylic-urethane polymers, vinyl acrylates, in addition to those mentioned hereinabove with respect to the aqueous base coat nail enamel compositions, and mixtures thereof. In selecting a suitable aqueous polymer, one criteria is the polymer's glass transition temperature, Tg, ° C. By glass transition temperature it is meant the temperature at which the non-crystalline portion of the polymer is transformed from a generally tough, rubbery material to a generally brittle, glass-like material. It is contemplated that suitable aqueous polymers having a glass transition temperature in the range of from about 0°

C.-95° C. or greater will be suitable for use in the aqueous based decorative nail enamel compositions of the present invention. Generally, any aqueous polymer having a glass transition temperature greater than 0° C. is considered to be acceptable, the desirable range being a glass transition temperature of higher than 10° C., and most preferably a glass transition temperature of about 95° C.

Suitable aqueous polymers for the aqueous decorative nail enamel compositions of the present invention specifically include those previously designated as Joncryl 1907 and Joncryl 1908. Additional aqueous acrylic emulsion polymers which are suitable are known as Joncryl 530 which is an emulsion polymer having 49% by weight non-volatiles and a glass transition temperature of 75° C., Joncryl 95 which is a colloidal polymer dispersion having a non-volatile content of 30% by weight and a glass transition temperature of 43° C., Joncryl SCX-1532 which is an emulsion polymer having 51% by weight non-volatiles and a glass transition temperature of 12° C., Joncryl SCX-2500 which is an emulsion polymer having 43% by weight non-volatiles and a glass transition temperature of 13° C., Joncryl 538 which is an emulsion polymer having 45% by weight non-volatiles and a glass transition temperature of 64° C. and Joncryl SCX 1970 which is an emulsion polymer having 48% by weight non-volatiles and a glass transition temperature of 78° C., the aforementioned aqueous polymers being available from S.E. Johnson Polymer. In addition, aliphatic waterborne urethane polymers such as Sancure 1073C which is available from B.F. Goodrich Specialty Chemicals of Cleveland, Ohio is also suitable for use in an aqueous decorative nail enamel composition. Sancure 1073C has a 30% non-volatiles content at a sward hardness of 100. From the foregoing, it should be appreciated that a large number of aqueous emulsion and colloidal dispersion polymers and copolymers having glass transition temperatures greater than 0° C. are suitable for use in an aqueous decorative nail enamel composition in accordance with the present invention.

It is contemplated that, by way of theory only, and not to be bound thereby, that the higher the glass transition temperature, the faster and greater the severity of cracking will occur in the aqueous decorative nail enamel composition. In this regard, the higher the glass transition temperature, the more brittle the resulting film and the greater degree and severity of cracking to be expected. Accordingly, glass transition temperatures of about 95° C. and above have been found to be most preferred for forming an aqueous decorative nail enamel composition pursuant to the present invention, although a glass transition temperature in the range of about 0 to 95° C. and greater is also contemplated in accordance with the present invention. The aqueous nail enamel compositions of the present invention may include aqueous emulsion and dispersion polymers and copolymers, and combinations thereof, in varying amounts up to 100% of the composition.

It is also contemplated that suitable aqueous decorative nail enamel compositions pursuant to the present invention can include the aforementioned aqueous dispersion and colloidal polymers and copolymers without additional additives. That is, it is contemplated that the aqueous decorative compositions may comprise an aqueous emulsion or colloidal dispersion of the aforementioned polymers and copolymers having a suitable glass transition temperature to provide an irregular film upon application over an aqueous or solvent base coat nail enamel composition.

In addition to controlling the glass transition temperature, varying degrees in the textured decorative appearance, e.g.,

degree or severity of cracking of the irregular film formed from an aqueous decorative nail enamel composition can be affected by the presence of a coalescing solvent and/or plasticizer. In this regard, it is contemplated that the use of coalescing solvents and/or plasticizers will lower the glass transition temperature of the aqueous emulsion or dispersion polymers and copolymers rendering them less brittle so as to facilitate the formation of a film with varying degrees of cracking. Therefore, it is contemplated that only a small amount of coalescing solvents and/or plasticizers will be used, if desired, to control the decorative appearance of the irregular film being formed from the aqueous nail decorative nail enamel compositions of the present invention.

Coalescing solvents and/or plasticizers are considered more suitable for use in controlling the nature of the irregular film where the polymers and/or copolymers have very high glass transition temperatures subjecting them to being more brittle and less flexible than those of lower glass transition temperatures. Suitable coalescing solvents and plasticizers have been discussed hereinabove, for example, butyl carbitol and dibutyl phthalate.

The aqueous decorative nail enamel compositions of the present invention can also include co-solvents such as isopropyl alcohol, ethyl alcohol, methanol, diacetone alcohol and mixtures thereof. The co-solvents can be used to control the solid content of the composition and the resulting irregular film, as well as increasing the drying rate of the aqueous decorative nail enamel composition when forming an irregular film. Further, the co-solvents will also protect the aqueous decorative compositions against potential freezing during shipping and storage.

As thus far described, the aqueous decorative nail enamel compositions are generally colorless. However, it may be desirable to provide color to the composition. In this regard, any one of well known colorants may be employed. For example, organic and inorganic pigments, as well as organic colorants such as tints or dyes may be used as is well known in the nail enamel art, such as those noted hereinabove. When pigments are employed, a suspending agent such as those previously noted may be employed to assist in the suspension of the pigments. In addition, acrylic copolymer aqueous dispersions may also be used as a suspending agent. One such acrylic copolymer is known as Drewthix 53L which is obtained from Drew Industrial of Boonton, N.J. which is a division of Ashland Chemical Company.

The following examples are provided to illustrate aqueous decorative nail enamel compositions of the present invention. These examples are by way of illustration and are not intended to be limiting the present invention either as to the inclusion of a lesser number of components, the substitution of additional components or variations in the percentages of the range of components. Examples 17-22 provide a colorless aqueous composition, while Examples 23-29 provide an aqueous color nail enamel composition.

WT/PERCENT	
JONCRYL 1908	91.00
ISOPROPYL ALCOHOL	6.50
DIBUTYL PHTHALATE	2.50

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WT/PERCENT	
JONCRYL 530	91.50
ISOPROPYL ALCOHOL	6.50
DIBUTYL PHTHALATE	2.50
WT/PERCENT	
JONCRYL 1908	92.00
ISOPROPYL ALCOHOL	8.00
WT/PERCENT	
JONCRYL 530	92.00
ISOPROPYL ALCOHOL	8.00
WT/PERCENT	
JONCRYL 1908	96.00
BUTYL CARBITOL	4.00
WT/PERCENT	
JONCRYL 530	96.00
BUTYL CARBITOL	4.00
WT/PERCENT	
JONCRYL 1908	100.00
PENN COLOR SOLUTION 368271 OR 365282	QS (quotient sufficient)
WT/PERCENT	
COMPOSITION OF EXAMPLE 17	100.00
PENN COLOR SOLUTION 365282	QS
WT/PERCENT	
JONCRYL 1908	100.00
PENN COLOR SOLUTION 344270 OR SUN CHEMICAL 39-92, 39-95 OR 39-96	QS

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WT/PERCENT	
TITANIUM DIOXIDE PIGMENT	38.00
STYRENE ACRYLIC RESIN (JONCRYL)	7.00
WATER	55.00
WT/PERCENT	
COMPOSITION OF EXAMPLE 26	66.23
JONCRYL 1908	33.77
WT/PERCENT	
JONCRYL 1908	27.00
COMPOSITION OF EXAMPLE 26	70.60
EASTMAN PM SOLVENT (PROPYLENE GLYCOL MONOMETHYL ETHER)	2.40
OPTIONAL PIGMENTS AND/OR ORGANIC COLORANTS	QS
WT/PERCENT	
COMPOSITIONS OF EXAMPLE 26	10.00
JONCRYL SCX 1970	83.50
EASTMAN PM SOLVENT	6.00
TAFIGEL PUR-50 (THICKENING AGENT)	0.50
WT/PERCENT	
STYRENE ACRYLIC POLYMER (Tg, 95° C.)	37.50-41.20
WATER	37.85-43.00
ISOPROPYL ALCOHOL	5.60
ETHYL ALCOHOL	4.80
DIBUTYL PHTHALATE	3.25
POLYPROPYLENE GLYCOL	0.85
AMMONIUM HYDROXIDE	0.85
PIGMENT	0.25-7.50
QUATERNIUM 15	0.17
BENTONITE	0.01-1.50

50 The aforementioned aqueous or solvent decorative nail enamel compositions produce an irregular film when applied to a natural synthetic nail which has previously been coated with a solvent or aqueous base nail enamel composition. As previously noted, the nail enamel compositions of the present invention which provide an irregular film include four combinations of solvent systems. Specifically, the four systems include (1) a solvent base coat composition for receiving a solvent top coat composition which forms an irregular film, (2) an aqueous base coat composition for receiving an aqueous top coat composition which forms an irregular film, (3) a solvent base coat composition for receiving an aqueous top coat composition which forms an irregular film and (4) an aqueous base coat composition for receiving a solvent top coat composition which forms an irregular film.

65 Initially, a natural or synthetic nail is coated with either a solvent or aqueous base coat nail enamel composition. The

base coat nail enamel composition is preferably allowed to partially dry, for example, to a condition known as "dry to touch." This condition arises when the surface of the resulting film may be touched with one's finger without leaving an impression of one's fingerprints. However, the film has yet to become completely dry. The time period to achieve a dry to touch will depend upon the particular base coat nail enamel composition being used, the thickness of the coat applied, temperature and humidity conditions. Once the base coat nail enamel composition has partially dried, an aqueous or solvent decorative nail enamel composition is applied thereover preferably as a single coat. However, multiple coats may also be applied if so desired. As the decorative nail enamel composition dries, an irregular film will be formed by virtue of the presence of a plurality of uniform or random cracks. These cracks may be small, such as fine hairline cracks, as well as large voids. The cracks or voids allow the color of the underlying base coat composition to show through providing a decorative pattern encompassed by the irregular film.

It is preferred that the base coat nail enamel composition not be completely dry, i.e., only dry to touch. Under these conditions, it is contemplated that the decorative nail enamel composition will strongly adhere to the base coat composition as the compositions completely dry. It has been found that if the base coat composition is initially completely dry, there is the possibility that the decorative nail enamel composition will have poor adherence. However, this condition might not be present when a solvent decorative nail enamel composition is applied over a solvent base coat nail enamel composition. In any event, it is contemplated that a clear protective top coat, either aqueous or solvent based, can be applied to protect the decorative nail enamel composition. The protective top coat may also be tinted if so desired. To this end, there is known from the nail enamel art, as well as the examples disclosed herein, protective clear or tinted top coats which will form a protective continuous film.

Although the invention herein has been described with reference to particular embodiments, it is to be understood that the embodiments are merely illustrative of the principles and application of the present invention. It is therefore to be understood that numerous modifications may be made to the embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the claims.

What is claimed is:

1. A nail enamel composition of non-toxic components for forming an irregular film over a base nail enamel composition applied to natural or synthetic human nails, said composition comprising an aqueous nail enamel composition including at least one film forming component having a glass transition temperature greater than about 10° C. in an aqueous emulsion or dispersion, said film forming component forming an irregular film upon drying.

2. The composition of claim 1, wherein said irregular film contains uniform or random cracks therein.

3. The composition of claim 1, wherein said film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

4. The composition of claim 3, wherein said film forming component is selected from the group consisting of acrylic polymers, styrenated acrylic polymers, acrylic-urethane polymers, vinyl acrylates, polyurethane, polyurethane copolymers, vinyl acetate polymers and vinyl acetate copolymers, olefin polymers and olefin copolymers.

5. The composition of claim 1, further including a coalescing solvent.

6. The composition of claim 1, further including a plasticizer.

7. The composition of claim 1, further including a pigment or organic colorant.

8. The composition of claim 7, further including a suspending agent.

9. The composition of claim 1, wherein said film forming component has a glass transition temperature greater than about 95° C.

10. A nail enamel kit of non-toxic components for forming an irregular film over natural or synthetic human nails, said kit comprising a base nail enamel composition including at least one base coat film forming component, said base coat film forming component forming a film over said natural or synthetic nails, and an aqueous nail enamel composition including at least one top coat film forming component having a glass transition temperature greater than about 10° C. in an aqueous emulsion or dispersion, said top coat film forming component forming an irregular film upon drying over said film formed from said base coat film forming component.

11. The kit of claim 10, wherein said irregular film contains uniform or random cracks therein.

12. The kit of claim 10, wherein said top coat film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

13. The kit of claim 12, wherein said film forming component is selected from the group consisting of acrylic polymers, styrenated acrylic polymers, acrylic-urethane polymers, vinyl acrylates, polyurethane, polyurethane copolymers, vinyl acetate polymers and vinyl acetate copolymers, olefin polymers and olefin copolymers.

14. The kit of claim 10, wherein said aqueous nail enamel composition further includes a coalescing solvent.

15. The kit of claim 10, wherein said aqueous nail enamel composition further includes a plasticizer.

16. The kit of claim 10, wherein said aqueous nail enamel composition further includes a pigment or organic colorant.

17. The kit of claim 10, wherein said top coat film forming component has a glass transition temperature greater than about 95° C.

18. The kit of claim 10, wherein said base coat film forming component comprises a solvent based polymer.

19. The kit of claim 10, wherein said base coat film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

20. A method of forming an irregular film over a base nail enamel composition applied to natural or synthetic human nails, said method comprising applying an aqueous nail enamel composition of non-toxic components including at least one top coat film forming component having a glass transition temperature greater than about 10° C. in an aqueous emulsion or dispersion over said base nail enamel composition, said top coat film forming component forming an irregular film upon drying.

21. The method of claim 24, wherein base nail enamel composition of non-toxic components includes at least one base coat film forming component over said natural or synthetic nails, said base coat film forming component forming a film over said natural or synthetic nails.

22. The method of claim 20, wherein said irregular film contains uniform or random cracks therein.

23. The method of claim 20, wherein said top coat film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

24. The method of claim 20, wherein said film forming component is selected from the group consisting of acrylic

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polymers, styrenated acrylic polymers, acrylic-urethane polymers, vinyl acrylates, polyurethane, polyurethane copolymers, vinyl acetate polymers and vinyl acetate copolymers, olefin polymers and olefin copolymers.

25. The method of claim 20, wherein said aqueous nail enamel composition further includes a coalescing solvent.

26. The method of claim 20, wherein said top coat film forming component has a glass transition temperature greater than about 95° C.

27. The method of claim 21, wherein said base coat film forming component comprises a solvent based polymer.

28. The method of claim 21, wherein said base coat film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

29. A nail enamel composition of non-toxic components for forming an irregular film over a base nail enamel composition applied to natural or synthetic human nails, said composition comprising an aqueous top coat composition including at least one film forming component having a glass transition temperature greater than 0° C. in an aqueous medium, said film forming component forming an irregular film upon drying.

30. The composition of claim 29, wherein said irregular film contains uniform or random cracks therein.

31. The composition of claim 29, wherein said film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

32. The composition of claim 29, wherein said film forming component is selected from the group consisting of acrylic polymers, styrenated acrylic polymers, acrylic-urethane polymers, vinyl acrylates, polyurethane, polyurethane copolymers, vinyl acetate polymers and vinyl acetate copolymers, olefin polymers and olefin copolymers.

33. The composition of claim 29, further including a coalescing solvent.

34. The composition of claim 29, further including a plasticizer.

35. The composition of claim 29, further including a pigment or organic colorant.

36. The composition of claim 29, wherein said film forming component has a glass transition temperature greater than about 10° C.

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37. The composition of claim 29, wherein said film forming component has a glass transition temperature greater than about 95° C.

38. A method of forming an irregular film over a base nail enamel composition applied to natural or synthetic human nails, said method comprising applying an aqueous top coat composition of non-toxic components including at least one top coat film forming component having a glass transition temperature greater than 0° C. in an aqueous medium over said base nail enamel composition, said top coat film forming component forming an irregular film upon drying.

39. The method of claim 38, wherein said base nail enamel composition of non-toxic components includes at least one base coat film forming component over said natural or synthetic nails, said base coat film forming component forming a film over said natural or synthetic nails.

40. The method of claim 38, wherein said irregular film contains uniform or random cracks therein.

41. The method of claim 38, wherein said top coat film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

42. The method of claim 38, wherein said top coat film forming component is selected from the group consisting of acrylic polymers, styrenated acrylic polymers, acrylic-urethane polymers, vinyl acrylates, polyurethane, polyurethane copolymers, vinyl acetate polymers and vinyl acetate copolymers, olefin polymers and olefin copolymers.

43. The method of claim 38, wherein said aqueous top coat composition further includes a coalescing solvent.

44. The method of claim 38, wherein said top coat film forming component has a glass transition temperature greater than about 10° C.

45. The method of claim 38, wherein said top coat film forming component has a glass transition temperature greater than about 95° C.

46. The method of claim 38, wherein said base coat film forming component comprises a solvent based polymer.

47. The method of claim 38, wherein said base coat film forming component comprises an aqueous emulsion or colloidal dispersion polymer or copolymer.

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