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[54] **METHOD OF COVERING FINGERNAILS**

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[57] **ABSTRACT**

A method of covering fingernails to strengthen them and to discourage nail biting comprises essentially of applying a coat of settable base material to the surface of the fingernail and thereafter applying a filler material which is made to adhere to the coat of the base material, which upon setting, forms thereby a protective fingernail cover which exhibits physical characteristics which are unpleasant when the fingers are inserted into the mouth.

10 Claims, No Drawings

METHOD OF COVERING FINGERNAILS

BACKGROUND OF THE INVENTION

There are many preparations available for mending broken fingernails and for strengthening the fingernails, as well as decorating the fingernails. It is to be understood that the expression fingernails includes natural and artificial fingernails and broadly includes also the toe nails (human and animal) and any keratinous material such as horn and hoofs of a living creature. These preparations essentially comprise a composition of a liquid base material, such as a nail lacquer, having dispersed therein a filler material in the form of fine particulate matter, such as short length fibers, as described in U.S. Pat. No. 3,342,686, nacreous pigments in the form of discrete particles, as described in U.S. Pat. No. 3,422,185 or finely ground chlorite, as described in U.S. Pat. No. 3,234,097.

One common disadvantage of these known preparations is the limited amount of dispersed material that can be supported in a liquid vehicle. Generally, anywhere between 3% to 10%, by weight, of the dispersed material is found in these preparations, even when suspending or anti-settling agents are used. Attempting to increase the amount of the dispersed material results in the settling to the bottom of a container, most of the dispersed material. Since the liquid vehicle is heavy and viscous, it is practically impossible to completely redisperse the particulate material by shaking the container.

In order to provide a proper protective cover for the fingernail, it is necessary to apply many coats of the preparation, pausing between the coats to permit drying before the next coat is applied. This procedure is very time-consuming and costly. Even if several coats are applied, after a short period of wear, the built up protective cover begins to peel and flake off in spots. This necessitates the removal of the deteriorated cover with a nail lacquer removal preparation and then repeating the process of applying a series of coats to form a new protective cover.

In the known preparations available for mending broken fingernails, a mixture of short length fibers are dispersed in a liquid vehicle which is spread across the fingernail fracture. Since only a very small portion of the fibers can be adequately supported in the liquid vehicle, many costs are required. Furthermore, there is a tendency for the fibers to refuse to leave the bristles of an applying brush, which also has a tendency to pick up the fibers which have already been deposited on the surface of the fingernail.

As for the object of promoting long fingernail growth by discouraging and preventing nail biting, there are several preparations on the market. These preparations are of a liquid nature and comprises a mixture of a liquid vehicle having mixed therewith a substance having a disagreeable taste when placed on lips or tongue of the nail biter. Although the liquid vehicle, upon drying, forms a partially waterproof coat, it becomes dissipated after repeated placement of the hands in water during washing or when working with water. Similarly, working hands come in contact with many things which mechanically wear away the coat. Also, the repeated placing of the fingers in mouth by the inveterate nail biting addict wears away the disagreeable taste; furthermore, the addict develops tolerance for the disagreeable substance.

As a final observation, the standard nail biting prevention preparations are not safe for children who may forget themselves and rub their faces and eyes with their fingers, causing extreme tearing and discomfort. It is very difficult to wash out the affected eyes and the infliction of pain is needlessly caused.

SUMMARY OF THE INVENTION

It is therefore the object of the invention to provide a method for mending broken fingernails and for strengthening the fingernails with a minimum expenditure of time.

Another object of the invention is to provide a method for covering the surface of the fingernail with a substance in such manner that the covering lasts a long time, regardless of frequency of exposure of the treated fingernail to water and mechanical abrasion.

Another object is to provide a method of mending a broken fingernail, wherein the amount of filler material can be determined at will, in a single application.

A further object of the invention is to provide a method of treating the fingernail to make it extremely disagreeable to a nail biter.

A still further object of the invention is to provide a method of applying to the fingernail, substances which combine together and act simultaneously as a nail biting deterrent and as a long lasting protective cover.

Another object of the invention is to provide a method for covering the fingernail with a safe cover so that the fingernail is distasteful to the nail biter and at the same time will not cause discomfort to other portions of the body when touched by the treated fingernail.

A related object of the invention is to provide a method of developing a protective fingernail cover which adheres firmly and exhibits no tendencies to peel off or flake off in spots.

A further object of the invention is to provide a method for applying a protective fingernail cover which extends beyond the tip of the fingernail, thereby building up and lengthening the fingernail beyond its tip.

A still further object of the invention is to provide a method for applying a protective fingernail cover, with a single application, wherein the cover is substantially thick and provides an armour-like shield which is sensed continuously by the nail biter.

A further object of the invention is to provide a method of applying a protective cover to an artificial fingernail which is adapted to be secured to a natural fingernail.

The invention comprises essentially the steps of (1) applying to the fingernail a coat of base material which will set as a result of evaporation or of chemical activity, such as thermosetting, and (2) thereafter applying a filler material which becomes embedded in the setting base material. To provide a better anchoring of the embedded filler material, a second application of the base material is applied atop the filler material. Preferably, the base material comprises an ordinary nail lacquer.

The filler material aside from its protective cover function, may also serve (1) a decorative function, as with the application of nacreous particles, (2) both a decorative and nail biting deterring function, as with the application of particles of colored aluminum, or (3) merely a nail biting deterring function, as with the ap-

plication of particles of abrasive material. The specifically mentioned materials are by way of an example only. Although any filler material may be used to build up and elongate the fingernail, a particular preference is had for materials which exhibit the same characteristics as the fingernail, such as powdered or finely granulated keratin.

The filler material may be applied lightly by sprinkling it on the coated fingernail or by applying it under a pressure, such as rolling or pressing the coated fingernail into a mound of the filler material. After the base material is set, the fingernail is brushed to remove excess or lightly adhering filler material. It is apparent that sprinkling provides a light protective cover and the pressure application will provide a heavy protective cover.

It is within the scope of this invention to use the foregoing described steps in depositing the base and the filler materials on an artificial nail comprising a sheet or film made from a suitable resin and having an undersurface coated with a pressure sensitive adhesive protected by a peelable backing.

DETAILED DESCRIPTION

The method of this invention achieves simultaneously two results; it physically strengthens the fingernail and makes the fingernail orally distasteful. Basically, the inventive method comprises the step of applying a coat of base material, such as a liquid nail lacquer, and then applying inert filler material, such as grit, metallic granules or resins so that they set in the lacquer. Although the use of nail lacquer is preferred, other physical form of base material may be employed to coat the fingernail, the only requirement being that the base material will set and anchor the embedded filler material.

The filler material may be any inert matter which will serve the function of strengthening the nail or making the fingernail orally distasteful, or both or additively decorative. If it is desired to merely strengthen the fingernail, the filler material may be in the form of coarsely ground keratin, Nylon or some other plastic resin. Preferably, the filler material should be clear or translucent, however, if a cosmetic effect is desired, the filler material or the nail lacquer may also contain pigments.

A substantial protective cover for the fingernail is developed by applying a moderate coat of nail lacquer and then applying a finely granulated filler material which has the same characteristics as the dissolved matter in the nail lacquer. This matter is generally nitrocellulose or cellulose derivatives which, upon coming in contact with the nail lacquer, will partly dissolve and coalesce to form a substantially homogeneous cover. A second application of nail lacquer will smooth out and blend in the finely granulated filler material. The nitrocellulose is used in finely particulate form (325 to 20 mesh).

Regarding the size of the filler material granules, there is no particular restriction, however, it is preferable to select granules which are more conducive to embedment in the nail lacquer and which will present a more cohesive cover if a further coat of nail lacquer is brushed over the embedded granules. If the granules are too big, they will not be effectively embedded in the film of the nail lacquer. On the other hand, if the granules are too fine, the gritty nature of the granules will not evoke immediate response of removal of the fingers from the mouth of the nail biter, as would a coarser grade of filler material.

It has been determined that the fineness of the filler material used as a nail biting deterrent should be such that the granules will pass through a screen of from 35 to 70 mesh. In this range of fineness, the filler material exhibits good embedment characteristics and nail biting deterrent characteristics. Of course, if the only object is to provide a protective cover for the fingernail, a filler material of greater fineness may be used, with the result that a more pleasing effect will be obtained since no graininess will be apparent.

Aside from the strengthening function achieved with the protective cover, the present method can be utilized to extend the length of the nails within a limited range. This is accomplished by repeated applications of nail lacquer interspersed with repeated applications of filler material to the tip of the fingernail. If the treated fingernail does have an undersurface (not having been bitten down to a nub) the nail lacquer is also applied to the undersurface and then followed with an application of the filler material. This can be repeated as many times as desired, however, bearing in mind that if the fingernail is extended too much, there is the possibility of it being broken off (as with any too-long fingernail).

The dual function of the cover can be further enhanced by using a filler material having a decorative characteristic. Such a filler material may be in the form of a coarse powder or fine granules of some metal or organic material, such as natural aluminum, colored aluminum, bronze, colored resins, guanine crystals, nacreous materials, etc. Also, flakes of any metal in the form of glitter may be used.

After the fingernail is brushed with the nail lacquer, it can be covered with a glitter made from metal, such as colored aluminum. The glitter is usually made from a thin metal foil which has been shredded into particles having a size 0.2 to 0.5 mm. After the glitter has been sprinkled or applied under pressure, a further coat of nail lacquer is desirably brushed on to more firmly interlock the particles to protect them from being accidentally removed when the fingernail comes into frictional contact with external objects.

Although a clear nail lacquer is preferred, colored nail lacquer or nail polish may be used. The clear nail lacquer used in the various examples which will be described hereinafter is a "nail base," being a solution of nitrocellulose in suitable organic solvents. Clear or colored nail lacquers are readily available in stores selling cosmetic wares. It should be pointed out that the nail lacquer produces a film through an evaporative process, which film secures the filler material to the fingernail. There are other substances which may be used as a coat of base material, such substances forming a film through a thermoplastic process using catalysts and including thermosetting resins. For mending broken fingernails, the entire fingernail or the area adjacent the fracture line is covered with a moderate coat of nail lacquer and thereafter sprinkled with a layer of resin fibers, such as Nylon, and allowed to set. For this purpose, the Nylon fibers should be in the range of 1/16 to ⅛ inch long and have a thickness of about three denier. After setting, a second coat of the nail lacquer is applied. The foregoing procedure is also followed in mending the fracture on the underside of the broken fingernail.

Before proceeding with the treatment of the fingernails, it is preferred that the fingernails be scrubbed with soap and water to remove dirt and traces of natural oils which would impair the adhesion of the treating materials applied to the fingernails.

EXAMPLE I

Spread or apply a uniform coat of base material, such as nail lacquer and then sprinkle a layer of filler material, such as particulate abrasive material or metallic granules, and allow the nail lacquer to set. Thereafter, shake off the excess of the filler material. If desired, the excess of the filler material may be brushed off.

EXAMPLE 2

Follow the steps mentioned in Example 1 and then apply an additional coat of base material over the adhering filler material to additionally anchor it.

In the event that the nail lacquer is too thin, it is advisable to brush on the fingernail at least two coats of the nail lacquer before applying the filler material. This procedure will permit a heavier film to be established on the nail and serve as a better base for the embedment of the filler material.

If the protective cover is primarily to serve as a nail-biting deterrent, the adhering filler material should be anchored or fixed with only one additional coat of the nail lacquer. Too many fixing coats of nail lacquer will dull the gritty nature of the filler material and it will not be too effective in controlling the nail biting impulse.

An excellent material to be used as a filler material which functions as a nail-biting deterrent is silica or crushed quartz. During experimentation, it has been found that silica (such as pure white sand) having Grades No. 4 and No. 7 and crushed quartz having Grades No. 2/0 and No. 1 gave good results as a deterrent. Excellent results were obtained by treating the fingernails of subjects with silica Grade No. 4 and with quartz Grade No. 1.

The subjects were divided into two groups; the first group had the fingernails treated with one coat of base material and one layer of silica, Grade No. 4, and the second group had a treatment of one coat of base material with a layer of silica Grade No. 1 followed by a second coat of base material. The nail biting was stopped immediately in both groups, the only difference being in the duration of the protective cover on the fingernail. The protective cover having only a single coat of base coat began to wear away after about a week on the fingernails of the active subjects, whereas the protective cover containing two base coats lasted anywhere from four to eight weeks. As a consequence, it was necessary to re-treat the fingernails of the subjects in the first group in order to provide continued protection.

EXAMPLE 3

As an effective nail-biting deterrent, apply a uniform coat of nail lacquer, sprinkle a layer of pure white sand, and allow the nail lacquer to set. After setting, shake off the excess of the sand or, in the alternative, bush off the loose sand. Preferably, the the application of a second coat of nail lacquer will form a common bond for the adhering sand.

EXAMPLE 4

For providing a heavy protective cover for the fingernail, apply a heavy coat of nail lacquer, apply a copious amount of granulated nitrocellulose, and allow the nail lacquer to set. Thereafter, brush off the loose nitrocellulose granules and preferably apply a second coat of the nail lacquer.

EXAMPLE 5

For mending a broken nail, apply a uniform coat of nail lacquer across the entire fingernail or adjacent the fracture, sprinkle a layer of Nylon fibers, and allow the nail lacquer to set. Preferably, apply a second coat of the nail lacquer to further anchor the adhering fibers. As to the fracture on the opposite side of the fingernail, follow the same procedure.

From the studies that have been effected, it has been determined that the main reason for the nail-biting habit is not so much the widely acclaimed emotional immaturity, as physical discomfort. A subject whose nails are bitten down to the nub experience continuous discomfort with the result that the fingernails are repeatedly placed into the mouth of the subject. Furthermore, fingers with very short fingernails are more sensitive than fingers with normal fingernails and cause discomfort when used in the normal way of handling objects or picking up objects. By treating the fingernails as indicated, the subject has a feeling of power in its finger tips, particularly when the treated fingernails brush against other objects. This feeling is quite noticeable and to such an extent that the subject does not even attempt to place his fingers into the mouth.

After about one week, the fingernail will begin to grow beyond the nub and the finger tips feel comfortable and there is practically no desire on part of the subject to place the fingers into the mouth.

Since the fingernail growth is relatively slow, it takes about three to four months to develop a tip, at the free end of the fingernail, to such a size as will be discernable as a normal nail. After such a period of time, there is substantially no inclination on part of the subjects to return to their former habits, even after the protective cover is removed with a nail polish remover. However, should circumstances occur, such as damaged or rough nails, and the subject makes any attempt to return to the habit, the fingernails should be treated again to protect them from the inevitable nubby condition.

Since the treatment of the fingernails described hereinabove requires time for application of the treating materials, it is within the scope of this invention to apply the treating materials to a sheet or film of a resin which has an undersurface coated with a pressure sensitive adhesive protected by a backing which can be peeled off to expose the pressure sensitive adhesive. For example, considering the nail deterrent aspect of the invention, a sheet of resin, such as cellophane or Mylar, are coated with a settable base material and then an application of white sand is made atop the base material. The film is prepunched or pre-cut to different sizes of fingernails so that the proper size of an artificial fingernail may be selected, the backing pulled off, and the artificial fingernail applied to the normal fingernail. The convenience of this aspect of the invention is quite apparent. In the alternative, a piece of the film is cut off and placed on top of the normal fingernail to determine the amount of trimming that has to be done to adequately cover the fingernail. Once this has been done, the backing is peeled off and the artificial fingernail is affixed to the normal fingernail. The artificial fingernail

is an excellent way of repairing a broken normal fingernail.

Artificial fingernails which are made with the primary function of achieving a decorative effect, can be readily removed from the normal fingernails and new artificial fingernails, having a different decorative effect, can be applied. This procedure eliminates the mess and inconvenience of removing the known type of colored nail enamel from the fingernails prior to the application of another nail enamel having a different color.

Although preferred examples of this invention have been described, it should be understood that other forms of fingernail treatments may be resorted to without departing from the scope of the invention described and claimed herein.

I claim:

1. A method of covering fingernails with a substantial protective cover, comprising the steps of applying a coat of settable base material to the surfaces of the fingernails, and embedding a particulate filler material in said base material before it sets, whereby said filler material becomes affixed to said fingernails.

2. A method according to claim **1,** including the steps of applying one or more coats of said base material atop said particulate filler material to further anchor it to said fingernails.

3. A method according to claim **1,** wherein the step of applying said coat of settable base material includes at least two applications, spaced in time, to permit the first application to set before proceeding with the second application.

4. A method according to claim **1,** wherein the step of embedding the particulate filler material comprises sprinkling it atop said coat of base material to obtain a light adhering layer and embedding said particulate filler material, under pressure, against said coat of base material to obtain a thick adhering layer.

5. A method according to claim **1,** wherein the steps of applying said two materials are repeated several times, with intervals therebetween, to build up the thickness of said protective cover and to extend it beyond the tips of the fingernails, whereby the tips of the fingernails are protected by a shield which extends the length of said fingernails.

6. A method according to claim **1,** wherein said settable base material comprises a nail lacquer, and said particulate filler material comprises a matter having abrasive qualities.

7. A method according to claim **1,** wherein said settable base material comprises a nail lacquer and said particulate filler material comprises a keratinous matter, including the step of applying one or more coats of said base material atop said particulate filler material.

8. A method according to claim **1,** wherein the coat of settable base material is applied to an area adjoining the fracture of a broken fingernail, and the particulate filler material is embedded in said base material, said base material comprising a nail lacquer and said particulate filler material comprising short length fibers of resin.

9. A method according to claim **1,** wherein the coat of settable base material comprises a nail lacquer and said filler material comprises a decorative matter.

10. A method according to claim **1,** wherein said base material and said particulate filler material are applied on the surface of an artificial fingernail having an undersurface coated with pressure sensitive adhesive adapted to secure said artificial fingernail to a normal fingernail.

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