A substantially dry mascara formulation, a mascara application composition and a method of applying the formulation is described. The substantially dry mascara formulation may be deposited on the surface of a carrier substrate and applied to the eye lashes by contacting the mascara and substrate to the eye lashes. An application tool may optionally be used to aid application of the formulation to the eye lashes. The present invention allows various desired color gradients, patterns or designs to be imparted to the eye lashes.
FIGURE 1

Graphic effects

Self adhesive micro dots – picked up by individual lashes

Printed lashes held in clear printed matrix

Dry mascara

FIGURE 2
FIGURE 6

FIGURE 7

Simple layer system

- Pigmented adhesive
- Backing film
- Adhesive
- Patterned ink layer: print/texture - dots, lines, etc.
- Transfer film: paper, plastic or combination
FIGURE 10

Backsheet

Adhesive layer

Transfer sheet

Remove backsheet then apply to eyelashes

Eyelash

Adhesive forms a strong bond with the transfer sheet

Transfer sheet

Dots form a weak bond with the transfer sheet and so are pulled through the adhesive layer to stick to the eyelash.

Pattern of microdots
FIGURE 11

Application:
1. Open pack
2. Remove dry mascara carrier
3. Position on upper lashes
4. Press all over to apply
5. Remove carrier
6. Repeat steps 2-6 for lower lid and second eye

Pressure sensitive ink indicates that enough pressure has been applied to transfer mascara.

FIGURE 12

Pattern type:
- Strips
- Square grid
- Hexagon
- Tilted hexagon
- Tilted hexagon with hexagon dots
- Bio-mimetic ameba, randomised

Key:
- Lash • Adhered mascara
- • Mascara not transferred

Increasing adhesion rates ➔
Application approaches

Application

1. Load refill (could be stored in handle)
2. Place and align applicator to eye
3. Move up thumb grip/press to evenly apply pressure and release
4. Remove applicator
5. Repeat steps 1–4 for second lash and eye
FIGURE 14

fold

concave edge configured to match contours of eyelid

cosmetic microdot

cosmetic composition disposed in gradient along I-I

cosmetic composition disposed in lines along I-I

cosmetic composition disposed in gradient perpendicular to I-I
COMPOSITION AND METHOD FOR DRY APPLICATION OF MASCARA

RELATED APPLICATION

[0001] This application claims priority to International Application Serial No. PCT/US08/83749 filed Nov. 17, 2008 which claims priority from U.S. Ser. No. 60/988,966 filed Nov. 19, 2007; which is hereby incorporated by reference in its entirety for all purposes.

FIELD OF INVENTION

[0002] The present invention relates generally to cosmetic compositions for eyelashes and methods for applying the cosmetic compositions to eye lashes.

BACKGROUND OF THE INVENTION

[0003] Conventional mascara formulations are wet or moist suspensions that are typically in the form of a thick paste that must be applied to the eye lashes of a person using a brush or comb applicator. Mascara compositions of the prior art may be characterized under ambient conditions as Newtonian or non-Newtonian (to include pseudoplastic and dilatant fluids) depending on the product attributes desired. These mascara formulations can be messy and difficult to apply. The mascara is loaded on to a brush applicator that is then brought into contact with the lashes to transfer the mascara to the eye lashes. Typically, this application process is repeated many times or teased to achieve the desired effect, the process being tedious and time consuming, often resulting in accidental deposition of product either in the eye or on the skin of the eye lids or face requiring corrective measures. Upon proper application, the mascara is then allowed to dry on the eye lashes. During the drying or curing period the composition can and will transfer from the lashes if contacted leading to further corrective measures and in some cases re-application of product.

[0004] This method of application requires a steady hand and must be done in a stationary environment to avoid smudging of the mascara to other parts of the face or clothing. Moreover, the application of mascara using a brush apparatus with bristles in close proximity to the eye can be intimidating and may dissuade persons from using mascara. Persons with poor eyesight or poor hand-eye coordination either have a very difficult time using mascara products or abstain from using such products. Using conventional mascara products and methods of application, it is not possible or very difficult to impart desired visual effects to the eye lashes, such as patterns or designs. Therefore, there is a need for an improved mascara formulation and a method of mascara application that avoids these problems.

SUMMARY OF THE INVENTION

[0005] The present invention provides a composition and a method for the application of a dry or solid mascara formulation to eye lashes. The object of the invention is to provide an improved composition and method for the application of a dry mascara formulation to eye lashes, delivering an instant effect. The present invention provides a simple and effective dry application technique that avoids the disadvantages of conventional mascara application formulations and application techniques. The method and composition described allow the application of mascara with various patterns or designs to be applied to the eye lash, which are difficult or not possible with conventional mascara formulations or application methods. Furthermore, the method and composition allow for an instant effect.

[0006] In another embodiment, a dry mascara formulation is provided that may be deposited on a planar substrate and transferred to the eye lashes from the substrate by putting the formulation in contact with the eye lashes.

[0007] In one embodiment, a mascara application system is provided comprising a first substrate material which acts as a carrier for the mascara formulation, a dry mascara formulation and a second substrate material placed on top of the mascara formulation.

[0008] In yet another embodiment, a mascara application system is provided by a layered system comprising a backing film, one or more adhesives, a patterned ink layer, and a transfer film layer, as well as a multitude of optional layers.

[0009] In another embodiment, a method for the application of dry mascara to eye lashes is provided, comprising contacting the eye lashes with a dry mascara formulation positioned on a carrier substrate and optionally applying pressure, heat, light or a combination thereof, to the mascara formulation or substrate to transfer the mascara to the eye lash.

[0010] The invention enables mascara with various patterns, designs or effects to be easily and effectively applied to the eye lash to achieve a desired eye lash appearance. Furthermore, patterns and designs may be super imposed upon one another to deliver dimensional effects.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 depicts the application tool pressed against a set of eyelashes with the eyelashes disposed over the surface of the applicator, such that when a cosmetic composition or other composition is present on the surface of the applicator, it is transferred upon the application of pressure, to the eyelashes. Various non-limiting effects which are achievable are also illustrated.

[0012] FIG. 2 shows an example of one possible application tool for the application of a dry mascara formulation.

[0013] FIG. 3 shows various dry mascara patterns that may be deposited on a carrier substrate.

[0014] FIG. 4 shows various mascara patterns that may be accomplished by the dry mascara formulation and method of application.

[0015] FIG. 5 illustrates a range of eye lash coverage and special effects that may be accomplished by the dry mascara formulation and method of application.

[0016] FIG. 6 illustrates eye lashes with mascara that incorporates a glitter material.

[0017] FIG. 7 illustrates one embodiment of a single layer system for delivering mascara according to the invention.

[0018] FIG. 8 illustrates one embodiment of a mascara delivery system according to the invention.

[0019] FIG. 9 shows two scanning electron microscope (SEM) scans of one possible configuration of dots. The scan on the right is a magnification of one of the dots in the scan to the left. The dots are approximately 0.2 mm (or 200 μm) in diameter.

[0020] FIG. 10 illustrates one embodiment according to the invention wherein the product is provided with a backing sheet and a transfer sheet, wherein the cosmetic product is sandwiched or housed between these two layers. The backing sheet and transfer sheet are pulled in opposing directions such that the backing sheet is peeled away, and upon removal
exposes an adhesive layer bearing a plurality of microdots. On contact with an eyelash, the adhesive adheres to the eyelash and affixes thereto the microdots. The transfer sheet is then peeled away from the eyelash leaving the microdots deposited on the aforementioned eyelash.

**0021** FIG. 11 illustrates one implementation of a product according to the invention which comprises a folded sheet having disposed on at least one inner surface a cosmetic product. The product may comprise a pressure sensitive ink on the outer surface which indicates when sufficient pressure has been applied to transfer the cosmetic to the eyelashes.

**0022** FIG. 12 illustrates various patterns in which the cosmetic composition may be applied or printed onto the product. As illustrated, tiled hexagon patterns of hexagonal “dots” provide for the most efficient transfer to the eyelashes, whereas lines of cosmetic are less efficiently transferred.

**0023** FIG. 13 illustrates two embodiments of applicator devices according to the invention. In embodiment “a” the product is loaded into a recess formed between two rigid plate-like members, which may have a slightly arched configuration according to the contours of the eyelids. In operation the user applies force to a lever which brings the plates together. The pressure required to transfer the cosmetic to the eyelashes. In embodiment “b” the product is held in a recess formed between a terminal end of the device and the edge of a solid member slidably disposed in the device, such that the slideable member may be moved toward the terminal end of the device to engage the product and create sufficient pressure to transfer the cosmetic to the eyelashes.

**0024** FIG. 14 illustrates four embodiments of the invention, wherein the cosmetic product is disposed on the backing layer as a plurality of microdots, a color gradient along line I-I, a color gradient perpendicular to line I-I, and a plurality of lines along line I-I.

**DETAILED DESCRIPTION OF THE INVENTION**

**0025** The present invention provides new compositions and products for applying cosmetics to the eyelashes and methods for applying the compositions to the eyelashes. The products comprise cosmetics for the eyelashes (e.g., mascara) that differ from conventional cosmetics of this type in that they are provided in a substantially solid form. Compositions of the present invention will come to the consumer as a peel and stick type product. Such compositions may employ powders, solid, semi-solids, or combinations thereof, but are not viscous liquids or pastes like conventional mascara products.

**0026** In a further departure from conventional products the present invention may be produced by one or more printing processes. That is the present invention may be a printed pattern of virtually any dimension and or design. Furthermore, the present invention may consist of or manifest itself as a single dot or set of dots combined to deliver a desired effect. The term dot shall be used as a general descriptive term from this point forward, however the term dot may represent a myriad of possible shapes. For example, shapes would include but not be limited to circles, triangles, stars consisting of at least two points, squares, rectangles, rhomboids, pentagons, hexagons, octagons and so on. The printing processes include but are not limited to lithographic press, flexography, xerographic or laser printing, release coating, digital print, ink jet format, and rotogravure or screen printing. The compositions of the present invention are considered to be instant, that is no manipulation or drying time is needed to gain the desired effect.

**0027** The compositions and methods of the present invention may be realized, for example, in the following manner. Referring now to FIG. 7, one embodiment of the product of the present invention can be described as a simple layer system. The inventive cosmetic product may be comprised of a backing film or protective layer upon which an adhesive layer has been placed. The next layer would be the colorant or printed image being fully incorporated or embedded into the aforementioned adhesive layer and the final layer would be a transfer film material made of a suitable material, such as paper, plastic, or a combination thereof. In this configuration, the backing layer serves as a disposable substrate to protect the adhesive from contamination or premature dry-out prior to use. The adhesive is employed to adhere the colorant or printed image onto the eyelashes as well as affix the cosmetic composition to the backing film and the transfer film prior to use. The transfer film holds the cosmetic composition and acts as an applicator of sorts for applying the composition to the eyelashes. The transfer film is then peeled away after the composition is positioned and the adhesion mechanism is triggered. The cosmetic composition may be applied to the adhesive/backing material by any suitable method such as printing or the like and may be provided as uniform coating or may be disposed thereof in a pattern.

**0028** Typically, the backing film acts as a protective shield for the adhesive. It comprises materials that have some affinity for the adhesive such that the adhesive sticks to the backing film, but that the backing film is easily removed. The transfer film or sheet serves as an anchor for one side or a portion of the cosmetic composition prior to use. Additionally, the adhesive is used to affix the cosmetic composition to the eyelashes upon use and is typically a pressure sensitive adhesive, which provides sufficient substantivity to hold the cosmetic composition on the eyelashes for as long as the effect is desired by the consumer.

**0029** The product will typically also comprise a backing film of thin plastic or paper material, preferably transparent plastic such as clear polypropylene or Mylar®, which covers and protects the cosmetic composition prior to use. The backing film should be removable by peeling without substantially disrupting the composition. The covering layer may be held in place by adhesive on the periphery or corners of the backing layer or by any other suitable means.

**0030** Referring now to FIG. 8, one embodiment of the product of the present invention can be described in greater detail as a more complex layered system. The carrier layer or protective non-stick layer is in direct contact with the adhesive layer or layers. This carrier layer may be a material such as biaxially-oriented polyethylene terephthalate polyester film (Mylar®). In direct contact with the adhesive layer opposite to the carrier may be a sealing layer to protect the colorant or printed pattern layer. A surface preparation layer comprising polyvinyl alcohol, polyvinylpyrrolidone, gelatine or combinations thereof and a second sealing layer sandwiches the patterned ink or colorant layer in. These sealing layers may be a varnish comprised of a drying oil, a resin and a solvent. Next is a release coating layer comprised of non-stick silicone or mixtures of silicones which allows the composition to separate from the backing or second carrier. An optional sizing agent may be employed to modify the stiffness or texture of the backing or second carrier which is comprised of paper, plastic or a combination thereof. Both carriers are designed to peel away, the first carrier is protective in nature and when removed exposes the adhesive that anchors the composition
to the eyelashes. The second carrier acts as an applicator of sorts and is peeled away after the composition is secured to the target substrate in this case the eyelashes.

[0031] To apply the composition to the eyelashes, the user first removes the protective layer from the product, if present, to expose the cosmetic composition. The backing layer is then folded over the eyelashes such that the composition is deposited on top and/or bottom of the lashes, as illustrated in FIG. 2. The backing layer may be provided with perforations or folds roughly in the middle of the sheet to facilitate folding. The composition transfers from the backing layer to the lashes on contact therewith, preferably through the application of pressure, such as by squeezing the folded backing layer with the fingers or with a specialized apparatus adapted to receive the folded product. Optionally, the backing layer, application tool or the composition itself may contain an indicator to alert the user as to when the appropriate conditions have been achieved for adequate deposition. Said indicator may manifest itself by a visual or tactile mode. The transfer may be improved by the application of heat, which is contemplated to reduce the force needed to remove the composition from the backing layer and transfer it onto the lashes. The product may be pre-heated using a hairdryer or the like or the specialized apparatus may be adapted to heat the backing material during application. The backing material is then removed from the lashes by releasing the applied pressure. Optionally, the product or the lashes may be wetted to assist in removal.

[0032] The invention described herein avoids the disadvantages of conventional mascara formulations and application techniques by applying a dry mascara formulation to eyelashes using a new dry transfer method of application. The dry mascara application method described herein does not include the use of a conventional brush applicator to apply wet or moist mascara formulation by brushing the eyelashes. Further, the invention enables a wide variety of aesthetic effects (patterns, designs, etc.) which are difficult or not possible with conventional mascara.

[0033] The adhesive may also be infused within or make up part of the composition or a combination of sprayed on the composition as well as being infused with or make up part of the composition.

[0034] Referring now to FIG. 1, one embodiment of the product of the invention is illustrated with eyelashes superimposed over the lower portion thereof. There is essentially no constraint on the shape of the backing layer, although at least one edge is preferably provided with a concave curvature substantially matching the curvature of the eyelid such that when the product is placed against the lashes, maximum coverage is obtained, as illustrated in FIG. 1. The opposing edge of the product may also be similarly configured such that when the product is folded over to encase the lashes, the top and bottom of the lashes each receive maximum coverage.

[0035] The backing layer may be composed of any suitable material such that it can be folded without breaking, including without limitation, polypropylene, acetate, polystyrene, or paper. In a currently preferred embodiment, the backing layer is a clear, flexible material.

[0036] The backing layer may be coated or laminated with an adhesive layer to improve adherence of the cosmetic composition thereto. Any adhesive that is suitable for cosmetic or medical use may be used. Adhesives include but are not limited to silicone adhesives, natural rubber adhesives, styrene-butadiene latex-based adhesives, butyl rubber and polyisobutylene adhesives, acrylic adhesives, vinyl ether adhesives, glues, bioadhesives, thermoplastic adhesives, thermosetting adhesives, elastomers, reactive adhesives, and the like. The adhesive may be, for example, a pressure sensitive adhesive, including without limitation, a heat or ultraviolet curable polymeric material. Rubber-based adhesives include those described in U.S. Pat. No. 3,289,478, the disclosures of which are hereby incorporated by reference. Acrylic adhesives include those described in U.S. Pat. No. 3,008,850 and U.S. Pat. No. 3,924,044, the disclosures of which are hereby incorporated by reference. The adhesives may further comprise a tackifying agent to adjust the adhesive properties. Acrylic pressure sensitive adhesives include those available from 3M under the trade designation 3M 9472 aminating adhesive.

[0037] The adhesive may be applied uniformly over one surface of the backing layer or may be printed on the backing layer in a pattern or design such that when the cosmetic product is deposited on the backing layer, it adheres predominantly to the adhesive and thus mirrors the printed pattern of the adhesive. In this manner a wide variety of aesthetic effects are achievable.

[0038] A key component of the inventive products is the cosmetic composition which is provided on the backing layer in substantially dry form. The cosmetic composition may comprise any ingredients conventionally included in cosmetic products, particularly mascaras, with the proviso that the nature of the ingredients and/or the amounts employed are selected such that the finished cosmetic product is substantially dry. Thus, the cosmetic compositions may include colorants (pigments, lakes, dyes, and inks), pearlescent agents, glittering agents, fillers, film-formers, emollients, humectants, surface-active agents, oils, solvents, thickeners, structuring agents, viscosity modifiers and the like.

[0039] The dry cosmetic composition may include an adherent (binder) component, which promotes the transfer of the dry mascara formulation from the substrate to the eyelashes and fixes the cosmetic composition to the eyelashes. Suitable adherent components include, but are not limited to solvents, oils, adhesives, waxes, resins or other materials that impart cohesive properties to the dry mascara formulation.

[0040] Solvents used in the production of the cosmetic product of the invention may be either volatile or non-volatile. Such solvents may be present in a residual capacity in the finished product but it should be stated that the overall composition is in the dry or solid form. That is the solvents would not be capable of flowing under ambient conditions in the final product configuration. Volatile solvents include but are not limited to organic solvents such as hydrocarbon solvents, alcohols and silicone solvents. Particular mention may be made of cyclomethicones, such as for example, hexamethyldicyclosiloxane, octamethyldicyclosiloxane, decamethyldicyclosiloxane, and volatile linear dimethyldisiloxanes. Nonvolatile silicone oils, both water soluble and water insoluble, are also contemplated to be suitable. Preferred non-volatile oils are high-molecular silicone such as dimethyl polysiloxane (dimethicone), phenyl trimethicone, and diphenyl dimethicone. Suitable water insoluble silicones include amine functional silicones such as amodimethicone; phenyl substituted silicones such as bisphenylhexamethicone, phenyl trimethicone, or polyphenylmethyldimethicone; dimethicone; alkyl substituted dimethicones; or mixtures thereof. Other solvents or vehicles include, but are not limited to, water, lower alcohols, fatty alcohols, fatty ethers, fatty
esters, isododecane, polyols, glycols, liposomes, laminar lipid materials, or any combinations thereof. Polybutene and polyisobutene are also contemplated to be useful. When present, the solvent or vehicle will typically comprise from about 0.001% to about 20% by weight, preferably from about 0.01% to about 10% by weight, more preferably from about 0.01% to about 5% or from 0.1% to about 1% by weight of the dry cosmetic composition. In some embodiments, the cosmetic compositions are substantially free of solvent, meaning they comprise less than about 1% by weight solvent, preferably less than about 0.5% by weight.

[0041] Waxes may be used as binders in the composition or may be employed to provide structure to the composition. Waxes that may be used in the dry cosmetic formulation comprise animal waxes, vegetable waxes, mineral waxes, various fractions of natural waxes, synthetic waxes, petroleum waxes, ethylene polymers hydrocarbon waxes such as Fischer-Tropsch waxes, silicone waxes and mixtures thereof. In particular, waxes used in the dry mascara formulation may include but are not limited to beeswax, carnauba wax, candelilla wax, paraffin wax, lanolin wax, shellac wax (animal waxes), bayberry wax (vegetable waxes), ozokerite wax, ceresin wax, microcrystalline waxes (petroleum waxes), polyethylene, Fischer-Tropsch waxes, alkyl methicones (silicone waxes), ceresin wax, bran wax, rice wax and jojoba wax and mixtures thereof.

[0042] Synthetic waxes also include, for example, polyethylene glycols such as PEG-18, PEG-20, PEG-32, PEG-75, PEG-90, PEG-100, and PEG-180 which are sold under the tradename Carbowax® (The Dow Chemical Company). Mention may be made of Carbowax 1000 which has a molecular weight range of 950 to 1,050 and a melting point of about 38°C, Carbowax 1450 which has a molecular weight range of about 1,305 to 1,595 and a melting point of about 56°C, Carbowax 3350 which has a molecular weight range of 3,015 to 3,685 and a melting point of about 56°C, and Carbowax 8000 which has a molecular weight range of 7,000 to 9,000 and a melting point of about 61°C. Wax-like materials that are a natural or synthetic resins or resin derivatives, such as rosinate esters, hydrogenated rosinate esters, polynamide resins, rubber, and latex are also contemplated to be suitable.

[0043] When present, waxes will typically, though not necessarily, comprise about 0.001% to about 90% by weight of the cosmetic composition. More typically, waxes will comprise from about 0.001% to about 50% or from about 0.001% to about 20% by weight of the cosmetic composition.

[0044] Polymers, co-polymers or terpolymers may also be used as binders or film-forming agents in the cosmetic compositions. The polymers, co-polymers or terpolymers used may be water-soluble or water-insoluble polymers and may be natural or synthetic.

[0045] Specific examples of polymers include hydrogenated polycyclopentadiene, latex-based polymers or co-polymers, diethyl phthalate, polyvinyl pyrolidone (PVP), polyethylene, polypropylene, polydialkylsiloxane polymers, ethylene/propylene copolymer, PVP/ethylene copolymer, polyethylene glycol-based polymers including alkyl acrylate or (meth)acrylates, acrylic acid (meth)acrylic acid or acrylamide or (meth)acrylamide polymers or co-polymers; polyvinyl esters, polyvinyl alcohols, olefin oxide polymers such as polyethylene oxide or polypropylene oxide; polysiloxane, polystyrene, polybutadiene, polyvinyl chloride, polyurethane, polycrylic acid, inside polymers, urethanes or polyurethanes, nylon polymers, polystyrene, polyester polymers and co-polymers thereof. Natural polymers include cellulose derivatives, algin and its derivatives, starch and its derivatives, guar and its derivatives and shellac polymers. The polymers may be present from about 0.1% to about 50% by weight, more typically from about 1% to about 10% by weight, of the dry cosmetic composition.

[0046] The cosmetic compositions may include film formers that are substantially water-resistant. One such water-resistant film forming polymer is the vinylpyrrolidone/ eicosene copolymer sold under the name Ganex® V-220 (marketed by ISP). Other water-resistant film formers include polyolefins, polyvinylpyrrolidone polymers and copolymers, polyethylene, polyalkyls, polystyrenes, triglycerides, epoxy resins, shellacs, and any combinations thereof.

[0047] The composition may also comprise water soluble or water dispersible film formers. These include, without limitation, butylated PVP, which is commercially available under the tradename GANEX P-904 (distributed by ISP), 2-hydroxyethyl acrylate, available as GANTREZ S-97-BF (distributed by ISP), diglycol(CHDM(cyclohexanediol)) and isophthalates (sulfatosulfonates) copolymer which is commercially available under the name AQ-555 (Eastman), acrylic copolymer emulsion (e.g. COVACRYL A15 and COVACRYL E14, distributed by LCW), acrylates/alkyl methacrylates copolymer in water (e.g. ULTRASOL 2000C, distributed by Presperse), modified starch (e.g. PURECOAT B793, distributed by Grain Processing), sulfonated polystyrene (e.g. FLEXAN II, distributed by National Starch), acrylates/C12-22 alkylmethacrylate copolymer (e.g. ALLIANZ OPT, distributed by ISP), ethylene carboxamide/ acrylic monodimethyl pentafluorosulfonic acid/methacrylic acid (e.g. ACUDYNE SCP, distributed by Rohm and Haas), acrylates/ethylhexyl acrylate copolymer (e.g. DAITASOL SJ, distributed by Daito Kasei Kogyo Co., Ltd.), or any combinations thereof.

[0048] Water absorbent or super-absorbent polymers may also be included in the compositions. The water absorbent polymers provide a swelling effect when brought into contact with water and thus may advantageously be included to impart a volumizing effect to the eyelashes. When these polymers are included, a method of volumizing the eyelashes will include the steps of first applying the composition to the eyelashes as described herein followed by a second step of wetting the eyelashes. Water absorbent polymers include crosslinked partially neutralized poly(acrylic acid), polyacrylamide, poly(ethylene oxide), poly(vinyl alcohol), sodium carboxymethylcellulose, sodium alginate, or any combinations thereof. Other suitable water-absorbent polymers include, but are not limited to, sodium carboxymethylcellulose, sodium acrylate copolymer (e.g. WATER LOCK G series and WATER LOCK A series, distributed by Grain Processing Corp.).
Polyquaternium-22, Polyquaternium-37, Polyquaternium-47, or any combination thereof.

The compositions may also include oil-resistant film-formers. Suitable oil-resistant film-formers include, but are not limited to, acrylics (acrylates), polyacrylates, acrylamide polymers and copolymers and quaternary salts thereof, urethanes, polyurethanes, polyesters, polycarboxylic acids, polyamides, polyols, polyethers, celluloses, proteins, polyamino acids, esters derived from resin, latexes, or any combinations thereof.

Silicone resins may be included as binders or film-formers in the compositions. One class of silicone resin contemplated to be especially useful are the silicone resins having tertiary connectivity of siloxane units (i.e., a T-resin). Such silicone T-resins comprise alkyl and/or aryl siloxyl groups, but preferably include aryl siloxyl groups such as phenyl siloxyl groups, in order to increase the refractive index of the resin. An example of such a resin is methyl phenyl silsesquioxane or polyphenyl silsesquioxane. Other suitable silicone T-resins include, without limitation, the C-2-25 alkyl phenyl silsesquioxane resins described in U.S. Patent No. 2004/0180011, the disclosure of which is hereby incorporated by reference. Propyl phenyl silsesquioxane resin, (Wacker Beltsil® SPR 45 VP, available from Wacker Chemical, Adrian, Mich.) is contemplated to be particularly useful. This polymer has a refractive index of 1.55 when measured as a liquid at 82°C and a refractive index of 1.57 when measured as a film at 25°C. By employing resins having a high refractive index, e.g., greater than 1.47, high gloss will be imparted to the eyelashes.

Plasticizing agents may also be included in the compositions. Suitable plasticizing agents include without limitation glycols and glycol derivatives (ethers and esters), acid esters, such as citrates, pthalates, adipates, carbonates, tartrates, phosphates and sebacates; and oxoethyleneated derivatives such as oxoethyleneated oils (e.g. castor oil and silicone oils).

Other viscosity modifying agents or gellants may be used in the dry mascara formulation. These include bentone, triglycerides, aluminum stearate, C₁₅-C₃₅ acid glycol esters, glycerclyl stearate, glyceryl tribenenate and the like. Solid gellants, including but not limited to fatty acid gellants, esters and amides of fatty acid gellants, hydroxy acids, hydroxy fatty acids, and other types of amide gellants are contemplated to be suitable. Particular mention may be made of ester-terminated poly(ester-amide) gellants. Other viscosity modifying agents or gellants include alginates, caromers, celluloses, gums, carageenans, starches or silicates, and the like.

The compositions of the invention will typically comprise one or more coloring agents. Suitable coloring agents, including pigments, lakes, dyes, and inks are well known in the art and are disclosed in the C.T.F.A. Cosmetic Ingredient Handbook, First Edition, 1988, the contents of which are hereby incorporated by reference. Organic pigments include, for example, carbon pigments, FD&C dyes, D&C dyes, including D&C Red Nos. 2, 5, 6, 7, 10, 11, 12, 13, 30 and 34, D&C Yellow No. 5, FD&C Blue No. 1, and Violet No. 2. Other colorants include FD&C Red No. 3, FD&C Red No. 40 (Allura Red AC), FD&C Red No. 19, FD&C Red No. 9, FD&C Red No. 21, FD&C Red No. 27, FD&C Red No. 13, FD&C Red No. 7, FD&C Red No. 6, FD&C Red No. 30, FD&C Red No. 36, FD&C Orange No. 4, FD&C Orange No. 5, FD&C Orange No. 10, FD&C Yellow No. 5, FD&C Yellow No. 6, FD&C Green No. 5, and mixtures thereof. Exemplary inorganic pigments include, but are not limited to, metal oxides and metal hydroxides such as magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxides, aluminum oxide, aluminum hydroxide, iron oxides (α-Fe₂O₃, y-Fe₂O₃, Fe₃O₄, FeO), red iron oxide, yellow iron oxide, black iron oxide, iron hydroxides, titanium dioxide, titanium lower oxides, zirconium oxides, chromium oxides, chromium hydroxides, manganese oxides, cobalt oxides, cerium oxides, nickel oxides and zinc oxides and composite oxides and composite hydroxides such as iron, titanate, cobalt titanate and cobalt aluminate. Other suitable colorants include ultramarine blue (i.e., sodium aluminum silicate containing sulfur), Prussian blue, manganese violet, bismuth oxychloride, talse, mica, sericite, magnesium carbonate, calcium carbonate, magnesium silicate, aluminum magnesium silicate, silica, titanated mica, iron oxide titanated mica, bismuth oxychloride, and the like.

The colorants may be surface modified with, for example, fluoropolymers, to adjust one or more characteristics of the colorant as described in, for example, U.S. Pat. Nos. 6,471,950, 5,482,547, and 4,832,944, the contents of which are hereby incorporated by reference. The pigment and/or fillers may be coated with fluorosilanes to improve water and/or oil resistance, as described in U.S. Pat. No. 6,315,900, the disclosure of which is hereby incorporated by reference.

The colorant may be present in any amount necessary to deliver the desired effect. Possible colorant loadings would range from about 0.001% to about 95% by weight of the composition, more typically from about 0.01% to about 50% by weight, or from about 0.01% to about 25% by weight of the composition. In other embodiments, the cosmetic compositions may be clear and thus will not comprise colorants.

The compositions may also contain coloring polymers which comprise chromophores grafted onto polymer chain or which comprise copolymers comprising coloring monomers. Suitable polymeric colorants include without limitation those described in U.S. Pat. No. 4,804,719; U.S. Pat. No. 4,999,418; U.S. Pat. No. 5,030,708; U.S. Pat. No. 5,032,670; U.S. Pat. No. 5,043,376; U.S. Pat. No. 5,102,980; U.S. Pat. No. 5,106,942; and U.S. Pat. No. 5,194,463, the disclosures of which are hereby incorporated by reference.

Pearlescent agents can be present in the composition at about 0 wt % to about 50 wt % based on the total weight of the composition. Suitable pearlescent agents include mica coated with titanium oxide, with iron oxide, with natural pigment or with bismuth oxychloride, such as colored titanium mica. Suitable pearling pigments include without limitation bismuth oxychloride, guanine and titanium composite materials containing, as a titanium component, titanium dioxide, titanium lower oxides or titanium oxynitride, as disclosed in U.S. Pat. No. 5,340,569, the contents of which are hereby incorporated by reference. Preferably, the pearlescent agents are present at about 1 wt % to about 20 wt % based on the total weight of the composition.

In some embodiments, it may be desirable to include glitter agents in the composition to achieve unique visual effects. Non-limiting examples of such glitter agents include coated/treated polyethylene terphthalate and titanium dioxide coated mica. A non-limiting example of such a coated/treated polyethylene terphthalate is available from Glitterex Corp. under the tradename 0.008" square Dark Gold polyflake. A non-limiting example of a titanium dioxide coated mica is available from Presperse Inc. under the trade-
name Flonac ME 10 C. Other materials useful as glitter include particles of metal, such as aluminum, copper, silver, gold, and brass, particles of transparent or colored, solid organic materials, including poly(ethylene terephthalate), polymethacrylate, and poly(vinyl butyral), and particles of metal coated film or paper, such as aluminum coated poly (ethylene terephthalate) film, to name a few.

[0060] Interferential goniochromatic pigments may also be included to impart iridescent, as described in U.S. Patent Pub. 2004/0076650, the disclosure of which is hereby incorporated by reference. Such pigments are commercially available under the trade names Such Infinite Colors (Shiseido), Sicopearl Fantastico (BASF), Colorstream (Merck), Color-glitter (3M) and ChromoFairy (Flex). Interferential fibres may also be included, as described in U.S. Pat. No. 5,472,798, the contents of which is incorporated by reference. Other components that impart a desired visual effect to the eye lashes may be added.

[0061] The dry cosmetic formulation may also optionally include fillers. The term “fillers” should be understood as meaning colorless or white, inorganic or synthetic, lamellar or non-lamellar particles. Fillers include silica, polymethylmethacrylate (PMMA), alumina, barium sulfate, talc, zinc stearate, mica, kaolin, nylon powder, polyethylene powder, Teflon, starch, boron nitride, or the like. Fillers may be in a concentration of from about 1% to about 50% by weight, from about 1% to about 20% or from about 1% to about 10% by weight. Suitable fillers also include copolymer microspheres such as EXPANCEL (Nobel Inds.), POLYTRAP (Dow Corning), and silicone resin microbeads (TOSPEARL from Toshiba).

[0062] The compositions of the present invention may optionally comprise a plurality of fibers dispersed therein in order to enhance the volume of the eyelashes, i.e., increase thickness and length thereof. The fibers may be of any type known in the cosmetic art and may be natural or synthetic. Thermoplastic fibers, such as those of polyethylene, polypropylene, or nylon, are preferred.

[0063] In addition, the compositions may include conditioning agents and emollients/moisturizing agents. Conditioning agent may include, without limitation, algae extracts, wheat amino acids, wheat protein, hydrolyzed vegetable protein and derivatives, keratin amino acids, serum protein, yeast extract, hydrolyzed mucopolysaccharides, hydrolyzed animal protein, chitosan, phytantriol, hydrolyzed corn protein, hydrolyzed soy protein, hydrolyzed silk, silk amino acids, and mixtures thereof. Emollient/moisturizing oils that can be incorporated in the composition of the invention include, without limitation, jojoba oil, lanolin oil, coconut oil, palm kernel glycerides, grape seed oil, evening primrose oil, sesame oil, castor oil, meadowfoam seed oil, emu oil, dime-thicone copolyol meadowfoamate, wheat germ oil, macadamia nut oil, avocado oil, and mixtures thereof. Other emollients include cetearyl octanoate, octyl palmitate, butylene glycol, propylene glycol, glycerin, glyceryl monoestearate, petrolatum, caprylic triglyceride, capric triglyceride, shea butter, and silicone oil.

[0064] The compositions may further include one or more additional components selected from the group consisting of anesthetics, anti-allergens, anti-fungals, anti-inflammatory, antimicrobial, antiseptics, chelating agents, emollients, emulsifiers, fragrances, humectants, lubricants, masking agents, medicaments, moisturizers, pH adjusters, preservatives, protectants, soothing agents, stabilizers, sunscreens, surfactants, thickeners, viscosity control agents, vitamins, pigments, bioactives, and any combinations thereof.

[0065] In currently preferred embodiments, the cosmetic compositions comprise Acronal V 215 (BASF), which is an aqueous dispersion of a polymer based on acrylic ester, ink comprising phenolic resin and cellulose derivatives dissolved in Dowanol and/or ink comprised of pigments/dyes in solutions of acrylic, vinyl & cellulose derivatives dissolved in water, and optionally carbon black as a colorant.

[0066] The cosmetic composition may be applied to the backing layer by any suitable means, including methods conventionally employed to make cosmetic “samplers.” For example, bulk thin film application techniques such as extrusion or spray technology have been used to make cosmetic samples, as described in U.S. Pat. No. 6,691,872, the disclosure of which is hereby incorporated by reference. Such techniques permit the cosmetic composition to be uniformly distributed over the surface of the backing layer. Additionally, the present invention may be produced using industrial printing processes, by industrial printers which include but are not limited to Redd Europe, Main Titles, and LetterSet or by medical adhesive and tape manufacturers such as Mactac, Scapa Group Plc, Adhesives Research Ltd, and Tape Specialties amongst others.

[0067] In other embodiments, the cosmetic composition is printed onto the backing layer. Methods for printing cosmetics onto substrates are also generally known, as disclosed in, for example, U.S. Pat. No. 5,192,386, the disclosure of which is hereby incorporated by reference. The printing process permits the cosmetic composition to be precisely deposited on the substrate in desired quantities and patterns. Further, with a printing process, the product may be printed with two or more different colors of cosmetic to provide unique effects when applied to the eyelashes.

[0068] Additionally, patterns may be mixed and matched with each other or with any of the aforementioned shapes, lines, or other configurations contained within. Such combinations could be applied either in a single application event, that is on opposing sides of the same sheet or in two or more single events applied sequentially. For example, the first application could deposit circles on the eyelashes and the next application could deposit complete lines, broken lines, or a shape or set of shapes differing from the first application.

[0069] Referring to FIG. 1, non-limiting examples of the types of effects that can be achieved are illustrated. In one principle embodiment, the product may comprise a uniform coating of color mascara such that when applied to the eyelashes, the color mascara transfers to the lashes in a relatively even fashion to give a look comparable to a convention mascara product. The mascara composition may be applied to the topside of the lashes, the underside of the lashes, or both.

[0070] FIGS. 1 and 14 also illustrates certain graphic effects that can be achieved, for example, by printing two or more colors onto the backing layer. Of the numerous variants according to this embodiment, special mention may be made of those wherein a color gradient is applied to the backing layer such that when the cosmetic composition is transferred to the eyelashes, a color gradient is formed on the lashes. The color gradient may be applied along the long axis of the backing layer (i.e., along the line 1-1) so that a color gradient is formed from the root of each lash to the tip of the lash, or the color gradient may be formed from left to right across the backing layer (i.e., perpendicular to line 1-1) so that a color gradient is established from the left to the right across the...
lashes. Rather than a gradient of colors, similar effects could be achieved using two or more colors in discrete bands such that, for example, the portion of the lash nearest the root is one color and portion nearest the tip is a different color, etc. There is essentially no limit to the aesthetic effects which can be achieved, including without limitation, rainbow patterns, wave patterns, and sun rise patterns, to name a few.

[0071] As shown in FIGS. 1 and 14, the backing layer may further comprise a plurality of self-adhesive micro dots, which can be use alone, or in combination with a cosmetic composition. The micro dots themselves may comprise the dry cosmetic composition or may be made of a polymeric material or the like, and will typically include an adhesive to facilitate transfer to the lashes. The micro dots may be configured in any pattern, the dots may be uniform in size or vary in size and shape as well as be positioned in any spatial orientation necessary to achieve a specific or desired effect. Said micro dots may form complete lines, broken lines, any of the aforementioned larger shapes, or any design that may be printed by one or more of the previously listed printing techniques.

[0072] Referring to FIG. 9, a non-limiting example presents the present invention as an array of micro dots. The micro dots may be any size but are typically, though not necessarily, from about 10 µm (microns) to about 2 mm in diameter, more typically from about 50 µm to about 1 mm, or from about 500 µm to about 0.5 mm in diameter. The plurality of micro dots may be the same color or may be different colors. It has been found that a thickening effect is obtained when the dry mascara product is in the form of micro dots, particularly if the micro dots are of suitable size to be supported on more than one lash.

[0073] Also illustrated in FIG. 1 is the use of a clear composition to impart to the lashes a matrix, which holds and separates that lashes. The clear composition may comprise a clear adhesive polymer, for example, which is printed onto the backing layer in a pattern, such as a plurality of rows. When the composition is transferred to the lashes, the row of clear composition are disposed substantially perpendicular to the lash to form a matrix. Alternatively, the clear composition may be applied as a uniform film over the backing layer. In this manner, the entire length of the lashes, or a portion thereof, is encased in the polymeric film. The film may be dimensioned such that it extends slightly beyond the tips of the lashes to provide a continuous “hard” edge or may be dimensioned such that the tips of the lashes extend beyond the edge to provide an edge having a “feathered” appearance. Furthermore, the present invention may take the form of lines or similar patterns as depicted in FIG. 3 such that the tips of the lashes are extended to impart a lengthening to the eyelashes.

[0074] In another principle embodiment, a method for the application of a dry mascara formulation to eye lashes is provided, comprising contacting the eye lashes with a dry mascara formulation which is deposited on a carrier substrate, and optionally varying the temperature of the mascara or applying pressure, light or a combination thereof, to the eye lash and mascara formulation to adhere the mascara formulation to the eye lash. In one embodiment, pressure is applied to the mascara formulation and substrate. In another embodiment, heat is applied to the mascara formulation and substrate when they are in contact with the eye lashes. In another embodiment, the dry mascara formulation is exposed to light when it is in contact with the eye lashes. In an alternate embodiment, the mascara is adhered to the eye lash by holding the formulation in contact with the eye lash for a period of time, without the application of pressure, heat or light. The carrier substrate is not a conventional brush applicator for applying mascara. In one embodiment, the carrier substrate is a thin film material. In one embodiment, an application tool is used to transfer the dry mascara formulation to the eye lashes. The application tool incorporates the dry mascara formulation on one or two surfaces that are brought into contact with the eye lashes. FIG. 1 and FIG. 2 depict examples of application tools that have the dry mascara formulation incorporated on a surface that is placed in contact with the eye lashes.

[0075] The method of applying mascara enables mascara with various patterns, designs or effects to be applied to the eye lash to achieve a desired eye lash appearance. The desired pattern or effect may be applied selectively on the top surface of the eye lash or on the underside of the eye lash with the present invention. In one embodiment, mascara with a desired colorant pattern is applied to the eye lash. FIG. 4 depicts several color patterns or gradients, which are possible with the present invention. In another embodiment, mascara with small graphics or illustrations are applied to the eye lash. In another embodiment, mascara with a reflective substance such as glitter is applied to the eye lash. FIG. 6 illustrates the eye lashes with mascara that contains glitter. The finish of the mascara product of the present invention, by way of non-limiting examples, could be matt, semi-matt, gloss, semi-gloss and combinations thereof. In another embodiment, mascara with desired visual effects such as a rigid “hard lash” effect or with a “black matt dot” pattern is applied to the eye lashes. FIG. 5 displays eye lashes with a “hard lash” effect. FIG. 6 illustrates eye lashes with a “black matt dot” pattern. In another embodiment, mascara with individual elements, such as “matt black dots”, may be applied to the eye lashes. The method allows for easy control of the amount of mascara to be applied to the eye lashes by controlling the amount of dry mascara deposited on the carrier substrate. The present invention is capable of imparting definition, length, visual effects, including holography, and volume or combinations thereof. Additionally, eyelashes with a light or thick coating of mascara are easily achieved using the invention.

[0076] FIG. 10 illustrates one embodiment according to the invention wherein a plurality of cosmetic microdots and an adhesive are disposed on a transfer sheet backing layer. A backing sheet covers the product and is removed to expose the adhesive and cosmetic microdots. When the exposed adhesive is pressed against the eyelashes, it adheres to the eyelash and transfers the microdot from the transfer sheet backing layer onto the eyelash. The microdots are only weakly bound to the transfer sheet and are thus readily transferred with the adhesive to the eyelash.

[0077] In one interesting embodiment, the product may have pressure sensitive ink on the face of the transfer layer opposite the cosmetic, as illustrated in FIG. 11. The pressure sensitive ink will change colors when sufficient pressure has been applied to transfer the cosmetic onto the eyelashes, and thus serves as an indicator that the product has been successfully and uniformly applied. In another embodiment, the product may employ a tactile cue such as raised protrusions altering the transfer layer to alert the consumer when sufficient pressure has been applied to transfer the cosmetic onto the eyelashes.

[0078] It has been found that certain patterns of printed cosmetic are superior for obtaining uniform coverage and
good transfer of the cosmetic onto the eyelashes. As shown in FIG. 12, the efficiency of transfer is relatively low for lines of cosmetic (printed along line I-I) because the eyelashes may not align on pitch with the cosmetic lines. Tilted hexagon patterns of hexagonal dots are contemplated to have superior adhesion efficiency to the eyelashes. The invention is not limited, however, to any particular pattern of printed cosmetic.

Exemplary applicator devices according to the invention are illustrated in FIG. 13. In embodiment “a” the folded product is loaded into a recess formed between two rigid plate-like members, which may have a slightly arched configuration according to the contours of the eyelids. In operation the user applies force to a lever, which brings together the plates to provide the necessary pressure to transfer the cosmetic to the eyelashes. It is contemplated that any such lever-actuated mechanism will be suitable for generating sufficient pressure to transfer the cosmetic to the eyelash. In embodiment “b,” also illustrated in FIG. 13, the product is held in an internal recess of a stick-type device. The recess is formed between a terminal end of the device and the edge of a solid member slidably disposed in the device, such that the slidable member may be moved toward the terminal end of the device, by pressure from the thumb or the like, to engage the product and create sufficient pressure to transfer the cosmetic to the eyelashes. However, it will be understood that no special applicator device is required, and that the product may be employed simply by squeezing between the forefinger and thumb, etc.

It will be understood that the terms “backing” and “transfer” when used to modify the “sheet” or “layer” are not intended to limit the product configuration, but rather are used to assist the reader in understanding the non-limiting embodiments shown in the drawings.

We claim:
1. A mascara applicator system comprising:
   a foldable transfer sheet having at least one edge of concave curvature configured to approximate the curvature of the eyelid such that when said edge is placed against the eyelashes, coverage of said lashes by said transfer sheet is maximized;
   a solid or semi-solid cosmetic composition disposed on at least a portion of one face of said transfer sheet;
   wherein said foldable transfer sheet is contoured to be folded over to encase the lashes such that with the application of pressure on the folded transfer sheet, said cosmetic composition is transferred to the eyelashes and held thereon by said adhesive.
2. The mascara applicator system according to claim 1, wherein said transfer sheet comprises paper.
3. The mascara applicator system according to claim 1, wherein said transfer sheet comprises perforations or folds roughly in the middle of the sheet to facilitate folding over the eyelashes.
4. The mascara applicator system according to claim 1, wherein said cosmetic composition comprises a plurality of cosmetic microdots.
5. The mascara applicator system according to claim 1, wherein said cosmetic microdots have a diameter from about 50 microns to about 0.5 mm.
6. The mascara applicator system according to claim 4, wherein said cosmetic microdots are arranged in a tilted hexagonal pattern.
7. The mascara applicator system according to claim 1, wherein said cosmetic composition comprises carbon black.
8. The device of claim 1, wherein said cosmetic composition comprises a color gradient or pattern on the surface of said transfer sheet.
9. The mascara applicator system according to claim 1, wherein said cosmetic composition is transparent.
10. The mascara applicator system according to claim 1, wherein said cosmetic composition is applied to said transfer sheet by a printing process selected from the group consisting of a lithography, flexography, xerographic printing, laser printing, release coating, digital printing, ink jet printing, rotogravure, and screen printing.
11. The mascara applicator system according to claim 1, further comprising a release coating layer disposed on said transfer sheet to facilitate separation of said cosmetic composition from said transfer sheet during use.
12. The mascara applicator system according to claim 1, wherein said release coating layer comprises a non-stick siliccone or mixtures of silicones.
13. The mascara applicator system according to claim 1, further comprising a backing sheet laminated onto said transfer sheet by an adhesive layer and overlaying said cosmetic composition to protect said cosmetic composition prior to use, said backing sheet being removable prior to use to expose said cosmetic composition and said adhesive layer.
14. The mascara applicator system according to claim 13, wherein said backing sheet comprises a transparent plastic material.
15. The mascara applicator system according to claim 14, wherein said backing sheet comprises a biaxially-oriented polyethylene terephthalate polyester film.
16. The mascara applicator system according to claim 1, wherein said adhesive comprises a pressure sensitive adhesive.
17. The mascara applicator system according to claim 1, where said transfer sheet comprise an indicator to alter the user when the product has been successfully applied to the eyelashes.
18. The mascara applicator system according to claim 1, where said indicator comprises pressure sensitive ink on the face of the transfer sheet opposite the cosmetic composition.
19. A method for applying a cosmetic product to eyelashes comprising:
   (i) providing a substrate having an adhesive composition and a dry or substantially dry cosmetic composition disposed on one face thereof;
   (ii) folding the substrate over the eyelashes such that at least a portion of said eyelashes are in contact with said adhesive and cosmetic compositions; and
   (iii) applying pressure to the opposing sides of said folded substrate to transfer the cosmetic composition to the eyelashes.
20. The method according to claim 18 further comprising heating the composition to facilitate transfer to the eyelashes.
21. The method according to claim 18 wherein an applicator device is employed to carry out said step of applying pressure to the opposing sides of said folded substrate.