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(54) **MOTORIZED PERSONAL SKIN CARE IMPLEMENT**

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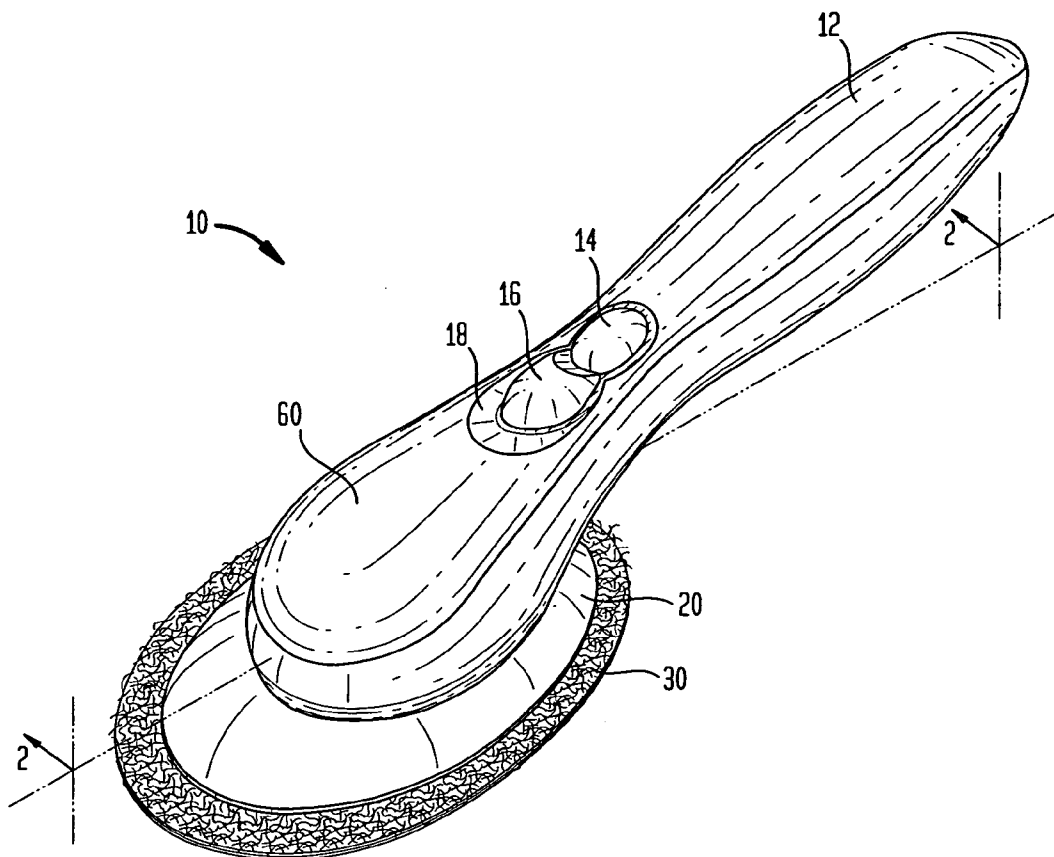
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(57) **ABSTRACT**

A motorized personal skin care implement capable of use with a disposable, single-use, skin care pad is disclosed with a molded hook arrangement for releasably but firmly holding the pad while cleansing or treating the skin but allowing for quick removal and replacement with a fresh cleansing or treatment pad. A method of using the skin care implement and a kit containing at least one pad and the implement is also described.

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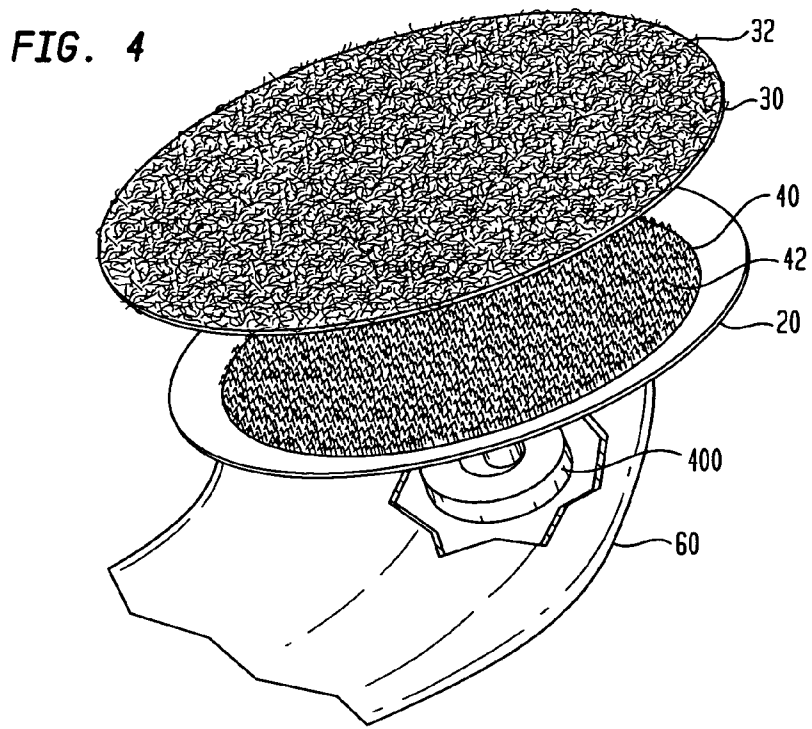
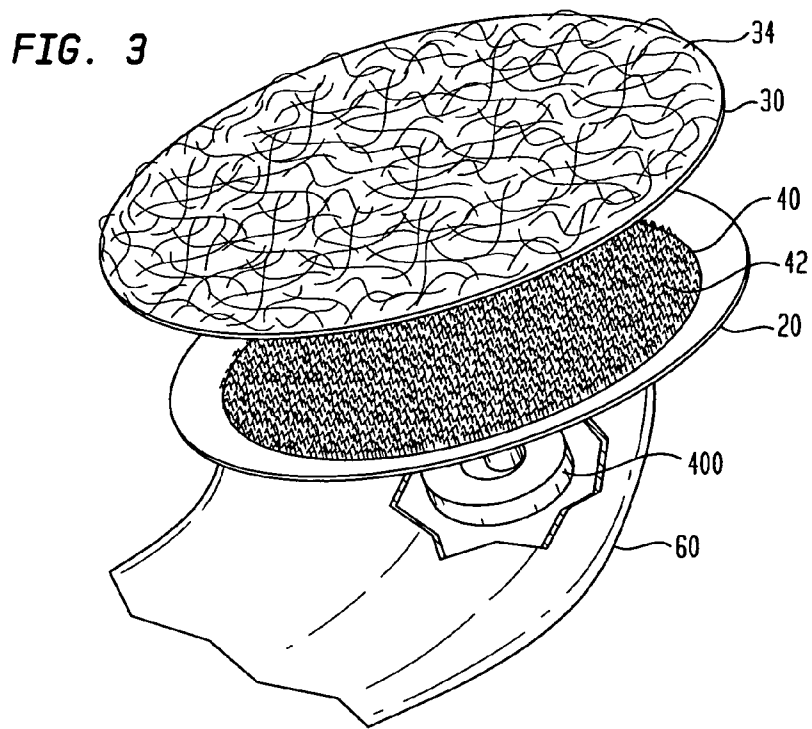


FIG. 5A
INVENTION

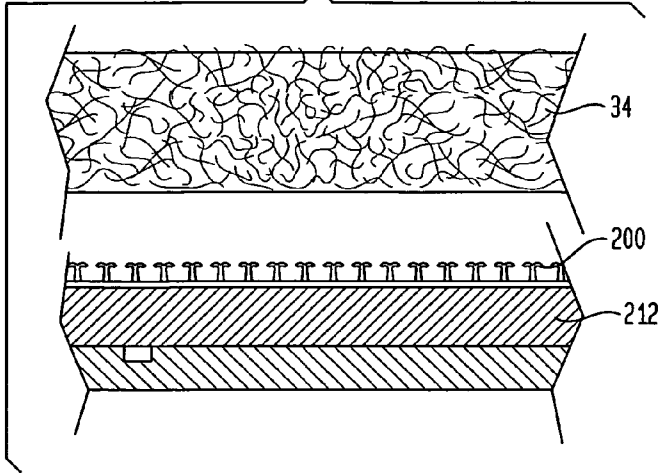


FIG. 5B
INVENTION

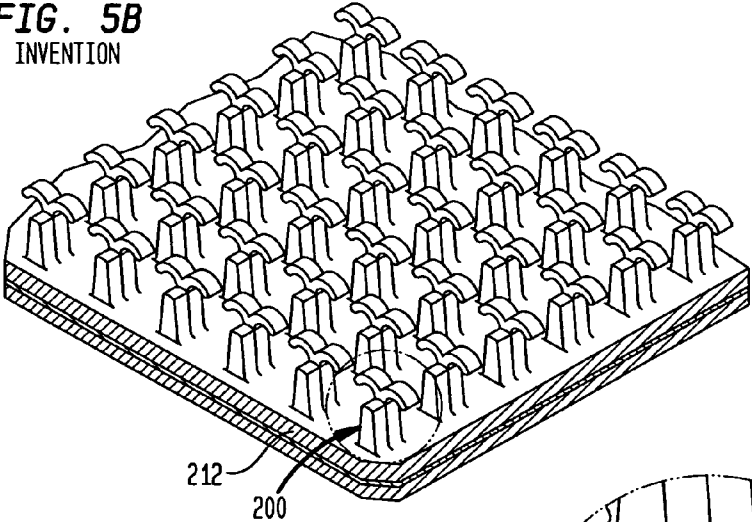


FIG. 5C
INVENTION

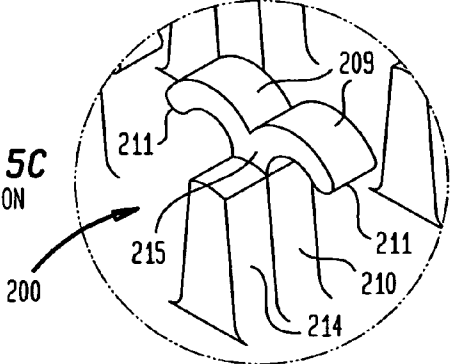


FIG. 6

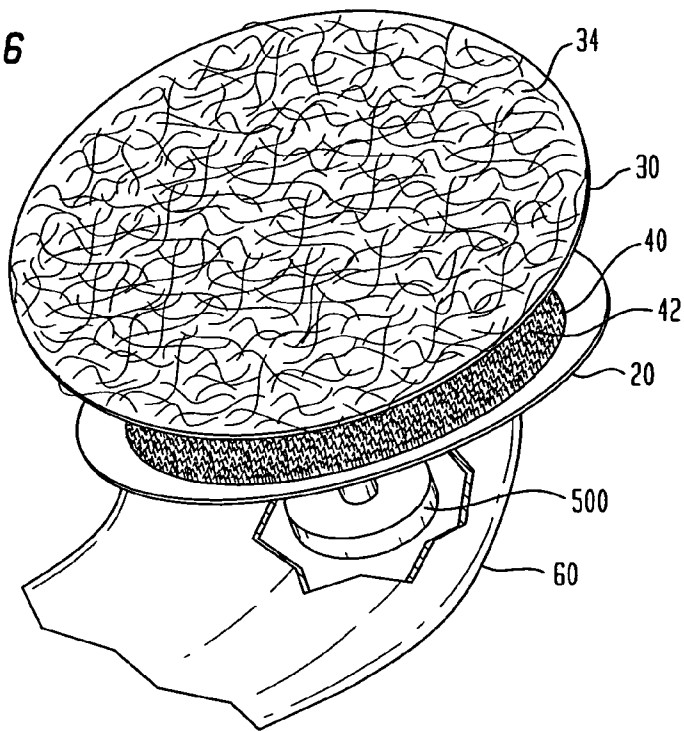
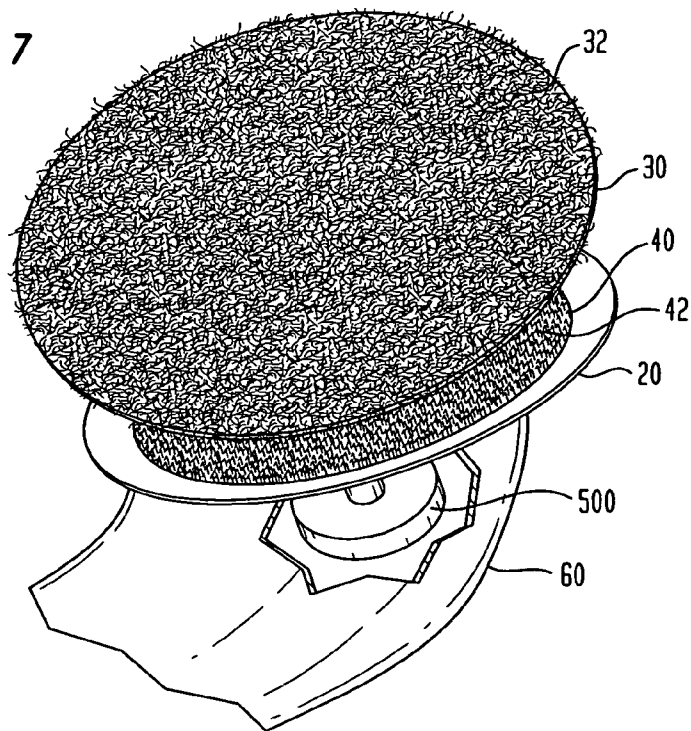


FIG. 7



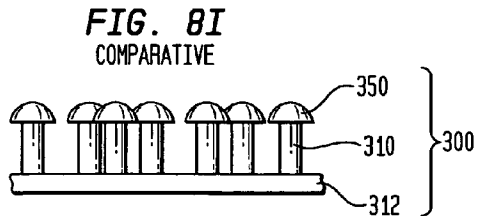
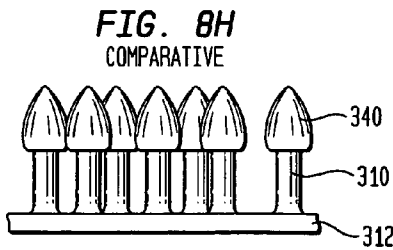
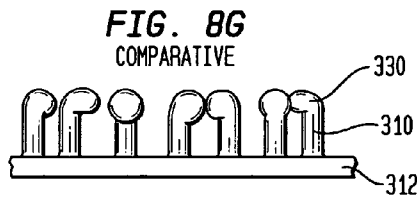
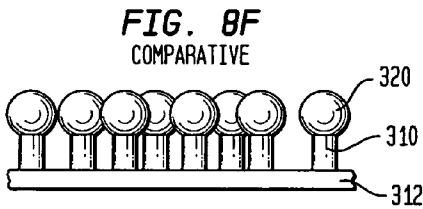
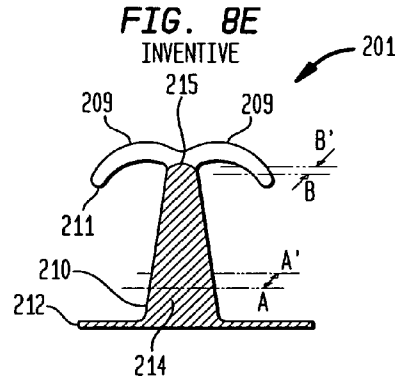
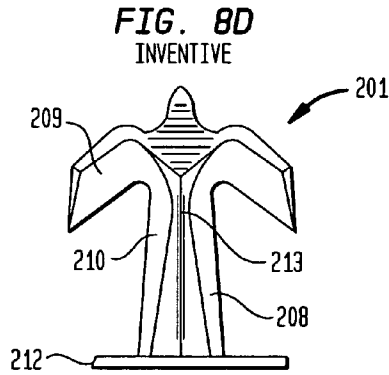
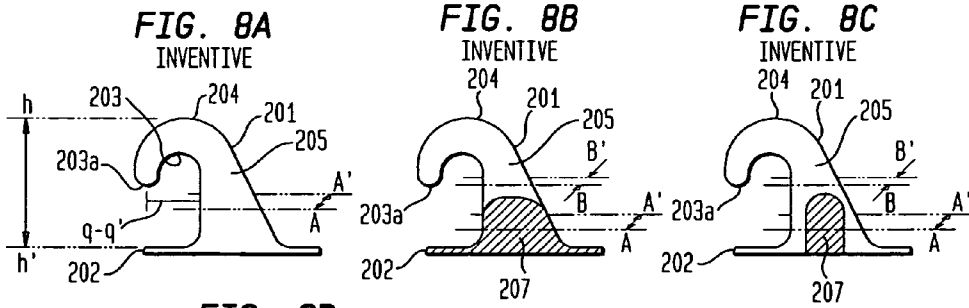


FIG. 9A
COMPARATIVE

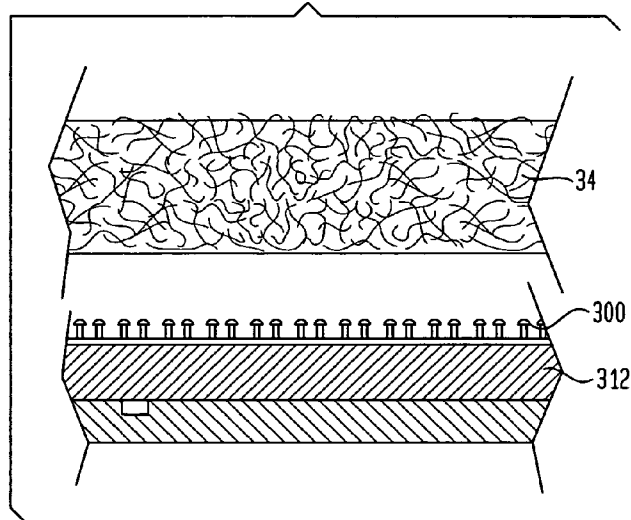


FIG. 9B
COMPARATIVE

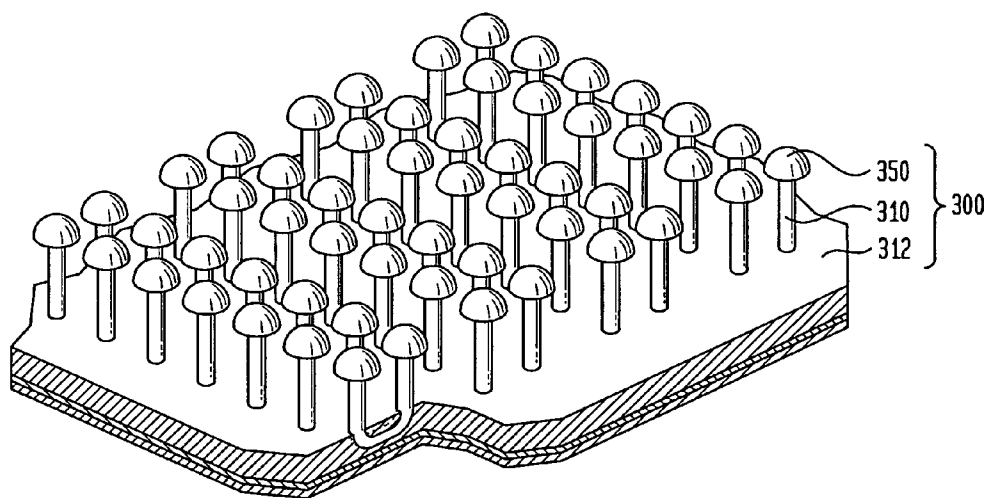
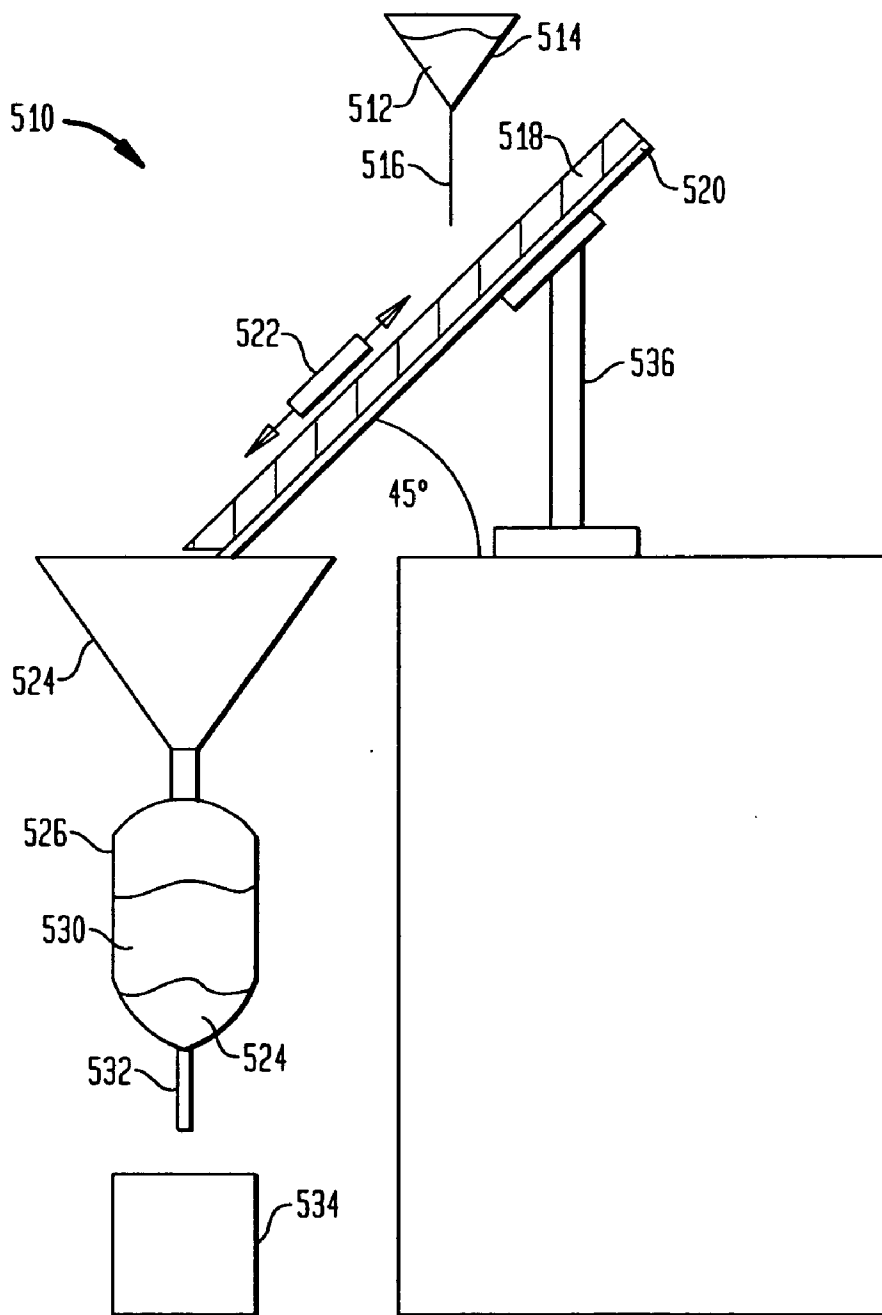


FIG. 10



MOTORIZED PERSONAL SKIN CARE IMPLEMENT

BACKGROUND

[0001] 1. Field of the Invention

[0002] The invention relates to a motorized personal skin care product and specifically to one having a disposable pad that is easily replaced when spent.

[0003] 2. Description of the Related Art

[0004] Personal skin care implements have traditionally been marketed in a variety of forms. These implements have attempted to satisfy a number of criteria to be acceptable to consumers. These criteria include cleansing effectiveness, skin treatment and/or massaging attributes and ease of replacing the cleansing/massaging media. Ideal personal skin care implements should gently cleanse the skin or hair, cause little or no irritation, and not leave the skin or hair overly dry after frequent use. Personal skin care products have also been combined with water insoluble fibrous substrates to improve convenience to the user. Motorized devices have been combined with water insoluble fibrous substrates to improve skin care efficiency and further obtain pleasant massaging attributes. Various attachment means for securing the skin treatment fibrous substrates to the motorized drive of prior art devices have been disclosed. A brief representation of the prior art is set forth below.

[0005] U.S. Pat. No. 5,671,497 issued to Abdo on Sep. 30, 1997 discloses a lotion applicator for hard to reach areas of the body having a pad with a loop fabric layer for engaging a hook substrate.

[0006] U.S. Pat. No. 6,692,505 issued to Maier et al. on Feb. 17, 2004 discloses a skin care device with a driving mechanism for rotating a micro fibrous pad for treatment of the skin.

[0007] U.S. Pat. No. 5,956,792 issued to Gutelius et al. on Sep. 28, 1999 discloses a hand held motorized cleaning apparatus for household cleaning with linear, orbital and/or dual motion that in one embodiment uses a polymeric fibrous pad where the pad is attached to the apparatus by way of hooks that engage the fibers of the pad.

[0008] Unfortunately, the motorized skin care products disclosed in the prior art are generally unsuitable for cleansing or treating the body and especially the face for various reasons. One weakness of the prior art implements is that the treatment media cannot be renewed easily. A still further problem is that the applicator heads are reusable and can allow for significant microbial growth. Another problem is the deficient latherability found for very mild cleansing agents such as polyglucosides when used in conjunction with the prior art water insoluble substrates.

[0009] The inventive skin care implement solves several of these problems, including the problem of replacing the treatment pad. Surprisingly it was found that specifically configured molded hooks were effective to engage fibrous pads of specific denier ranges with sufficient force to withstand the stresses of cleansing or skin treatment with the motorized implement while allowing for easy replacement by the user in order to provide a fresh treatment pad.

SUMMARY OF THE INVENTION

[0010] This invention relates to a skin care or skin care article including but not limited to:

- a. an electromechanical device capable of transferring vibratory, oscillatory, rubbing or rotatory motion or a combination thereof;
- b. a fastener substrate having a plurality of molded or shaped elements each having a first and a second end, the elements

projecting from a base at the first end and having a hook shaped second end, wherein the base is attached to the electromechanical device; and

c. a disposable pad composed of a water insoluble fibrous substrate having at least one layer of fibers with an average denier in the range of about 1 to 12, wherein said substrate contains about 0.5 to 3000% by wt. in total concentration based on the dry substrate of at least one of skin conditioning component(s), skin active agent(s), lathering surfactant(s) or a blend thereof, said component(s) being releasably associated with said substrate; said pad being attached to the fastener substrate by way of the hook shaped second end.

[0011] In another aspect of the invention is a skin care system package, including but not limited to:

- a. a plurality of disposable pads as described above;
- b. an electromechanical device including the fastener substrate as described above for supporting one of the plurality of disposable pads during use; and,
- c. a container for packaging the electromechanical device and the plurality of disposable pads.

[0012] In another aspect of the invention is a skin care system kit, including but not limited to:

- a. an electromechanical device capable of transferring vibratory, oscillatory, rubbing or rotatory motion or a combination thereof;
- b. a fastener substrate having a plurality of molded or shaped elements, each element having a first and an opposed second end, the elements projecting from a base at the first end and having a hook shaped second end, wherein the base is attached to the electromechanical device;
- c. at least one disposable pad composed of a water insoluble fibrous substrate having at least one layer of fibers with an average denier in the range of about 1 to 12, wherein said substrate contains about 0.5 to 3000% by wt. in total concentration based on the dry substrate of at least one of skin conditioning component(s), skin active agent(s), lathering surfactant(s) or a blend thereof, said component(s) being releasably associated with said substrate; said at least one disposable pad being capable of attachment to the fastener substrate by way of the hook shaped second end when a user presses the pad against the hook shaped second end of the fastener substrate.

[0013] In a further aspect of the invention is a method for simultaneously cleansing and/or treating and further massaging the skin by a user comprising the steps of in no particular sequence:

- a. contacting the skin with the inventive skin care or cleansing article;
- b. activating the electromechanical portion of said article to provide stimulating effect to the skin; and
- c. allowing the article to remain on the skin for a time sufficient to cleanse and/or treat the skin according to the preferences of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective representation of one embodiment of the inventive motorized skin care implement having a water insoluble substrate pad.

[0015] FIGS. 2A and 2B are cross-sectional views of FIG. 1 showing two preferred embodiments of the pad coupled to a vibration generator.

[0016] FIG. 3 is a perspective representation of a section of another embodiment of the inventive motorized skin care

implement capable of oscillatory motion, parts being broken away for clarity, showing a pad being received on the fastener substrate.

[0017] FIG. 4 is a perspective representation of a section of another embodiment of the inventive motorized skin care implement capable of oscillatory motion, parts being broken away for clarity, showing a pad with different denier fibers from that in FIG. 3 being received on the fastener substrate.

[0018] FIG. 5A is an enlarged cross-sectional view of the pad being received onto one embodiment of the fastener substrate.

[0019] FIG. 5B is an isometric view of a section of the fastener substrate depicted in FIG. 5A showing a multiplicity of hooks suitable for this invention illustrating the relationship of the crook portion to the thickened stem portion and how they are configured together at the neck of the hook. The hooks are shown positioned on a base.

[0020] FIG. 5C is an isometric view of an enlarged section of the fastener substrate depicted in FIGS. 5A and 5B showing one hook in detail.

[0021] FIG. 6 is a perspective representation of a section of another embodiment of the inventive motorized skin care implement capable of rotary motion showing a pad being received on the fastener substrate.

[0022] FIG. 7 is a perspective representation of a section of another embodiment of the inventive motorized skin care implement capable of rotary motion showing a pad with different denier fibers from that in FIG. 6 being received on the fastener substrate.

[0023] FIG. 8a shows a cross-sectional view of a hook design described by Provost in U.S. Pat. No. 4,984,339 that is suitable for the invention.

[0024] FIG. 8b shows a cross-sectional view of the hook of FIG. 8a using a side reinforcing section of the hook to enhance tear strength of the hook substrate that is suitable for the invention.

[0025] FIG. 8c shows a cross-sectional view of a hook design according to Murasaki in U.S. Pat. No. 5,131,119 with side reinforcing similar to the side reinforcing section of FIG. 8b that is suitable for the invention but without tracing the general shape nor filling the complete area of the stem of the hook where the reinforcing rib is placed.

[0026] FIG. 8d depicts a cross-sectional view of a hook design of Ribich as disclosed in U.S. Pat. No. 3,708,833 showing a tapered top and angled crook lobe that is suitable for the invention.

[0027] FIG. 8e is a cross-sectional view of a hook showing a base, a stem, a neck and a head, wherein the head has two opposing complementary crooks projecting from the neck, opposing each other and substantially aligned parallel to the long dimension of the base and a broadened stem outlined by the hash-marked area that is suitable for the invention.

[0028] FIG. 8F to I are front elevational views of various comparative fasteners. FIG. 9A is an enlarged cross-sectional view of the pad being received onto a comparative fastener substrate with the fastener elements depicted in FIG. 8I.

[0029] FIG. 9B is an isometric view of a section of the fastener substrate depicted in FIG. 9A showing a multiplicity of comparative fasteners. The fastener elements are shown positioned on a base.

[0030] FIG. 10 is a schematic diagram of a suitable apparatus for carrying out the lather volume test method.

DETAILED DESCRIPTION OF THE INVENTION

[0031] All publications and patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety.

[0032] Referring now to the drawings in which like figures represent like elements, in FIG. 1, skin care article 10 includes a handle 12 on one end and housing extension 60 on the opposite end. Pad support 20 is coupled to housing extension 60 by a mechanical drive train or direct drive motor coupling (not shown) in order to drive the motion of pad support 20. Momentary on—off switch 14 and continuous on switch 16 are positioned in recess 18 between handle 12 and housing extension 60.

[0033] Referring to FIGS. 2A and 2B, vibration generator 600 is fixedly attached to housing extension 60 so that vibrations will be transmitted to pad support 20, fastener substrate 40 and pad 30 to impart vibrations to the skin of the user when the generator is energized. Pad 30 has two fibrous layers 32 and 34 of differing fiber denier as shown in FIG. 2A. Pad 30 has a single fibrous layer 36 of intermediate fiber denier as shown in FIG. 2B.

[0034] FIGS. 3 and 4 show an embodiment of the inventive skin care implement having an oscillatory motion generator 400 positioned in housing extension 60 that is coupled to pad support 20 via a mechanical linkage (not shown) in order to drive pad 30 in an oscillatory pattern. In operation, the pad is pressed on to pad support 20 containing shaped hooks 42 positioned on fastener substrate 40 by the user and the implement is energized via e.g. switch 14 or 16 (such as shown in FIG. 1). Pad 30 is a dual sided fibrous pad having a fine fibrous layer 32 adhered to a coarse fibrous layer 34. In a further embodiment, oscillatory motion generator 400 can be positioned elsewhere in the implement and linked to the pad support via an appropriate eccentric or gear drive or an equivalent drive mechanism as is well known in the art and equivalents thereof.

[0035] Now referring to FIG. 5A, the pad 34 is shown being received onto a preferred embodiment of hooks 200 fixedly positioned on base 212 also shown in an isometric perspective in FIG. 5B. Referring to FIG. 5C, hook 200 has twin crooks 209 as the head of the hook 200. The crooks 209 are connected through the neck 215 of the hook to the stem 214 and project outward from the neck 215 generally parallel to the base of the fastener substrate 212. The crook 209 can be curved to the degree desired to enhance its ability to trap or ensnare pad fibers when the hook is plunged into a pad 34. This general shape is often referred to as a “palm tree” hook in the art. In further detail, hook 200 has a broad stem 214 throughout the entire stem portion and extending up to the neck 215 of the hook 200. The crook 209 of the hook extends beyond the neck 215 and has a thinner crook shank 210 than the combination of stem portion 214 and crook shank 210. The twin crooks 209 can be of any convenient shape, but a smooth sweeping curve from the neck continuously decreasing in vertical thickness (i.e. along a line drawn perpendicular to base 212 from the base at the neck 215 to the hook tip 211) is preferred.

[0036] FIGS. 6 and 7 show an embodiment of the inventive skin care implement having a rotational motion generator 500 positioned in housing extension 60 that is coupled to pad support 20 via a mechanical linkage (not shown) in order to

drive pad **30** in a rotational pattern. In operation, the pad is pressed on to pad support **20** containing shaped hooks **42** positioned on fastener substrate **40** by the user and the implement is energized via e.g. switch **14** or **16** (such as shown in FIG. 1). Pad **30** is a dual sided fibrous pad having a fine fibrous layer **32** adhered to a coarse fibrous layer **34**. In a further embodiment, rotational generator **500** can be positioned elsewhere in the implement and linked to the pad support via an appropriate gear drive or an equivalent drive mechanism as is well known in the art and equivalents thereof.

[0037] FIG. **8a** is a molded hook **201** with a base **202**, a stem **205**, a crook **203**, a hook top **204** and a crook tip **203a**. The hook has a lateral thickness AA'. This dimension will be referred to as lateral thickness for all hook types described herein for the stem **205** where it is adjacent to base **202**. The crook **203** has the same lateral thickness as the stem **205**. The crook **203** of FIG. **8a** has an additional thickness which is that dimension from the bottom of the crook **203** to the top of the crook **204**. This latter dimension is referred to as vertical thickness. Also illustrated is crook width qq' and hook height hh'. This terminology of lateral and vertical thickness and crook width and hook height is used throughout this application regardless of the type hook being described.

[0038] When penetrating into the pad fibers, the hook top **204** pushes aside the fibers which slip below the crook tip **203a** and swing under the crook **203**. After such action takes place, if an attempt is made to separate the fastener substrate and the pad, the fibers resting under the crook of the hook are trapped within the crook and the pad can not be removed without bending a crook or breaking the fiber(s). When the hooks restrain fibers in the manner described, the pad and fastener substrate are considered to be engaged. Usually the number of hooks will be substantially less than the number of fibers. Therefore, the degree of engagement is considered to be the number of hooks that are engaged relative to the total number of hooks available for engagement. Engagement can be referred to as a percentage of actual hooks engaged to the actual number of hooks present that might be engaged. Percentage engagement will be dependent upon many things, but one factor that plays a major role in engagement is the force applied to press the two elements together, which we refer to as engagement force herein. Generally, the greater the engagement force the higher the percent engagement. However there is a practical limit to the amount of force a user of the skin care implement can comfortably apply. The inventive implement allows the pad to be securely attached to the implement within the range of engagement force that can be comfortably applied.

[0039] Engagement force itself will depend upon several factors. One very important factor is the shape of the hook. A very broad, flat topped hook would be expected to require more force to push aside the fibers than a very thin topped hook. Therefore the top of the hook in FIG. **8a** being very flat and broad will require considerable force to penetrate into the mass of fibers. In addition the fibers are diverted, bent and crushed by the broad top of the hook. One way to maintain the engagement penetration force comfortably low is to make the hooks very thin. However, very thin hooks have a tendency to twist and bend and the crook portion of the hook twists out from under the fibers rather than bending straight back, a mechanism which provides the maximum efficiency of the hook design.

[0040] A method used to discourage this twisting is to apply reinforcing ribs to the sides of the hook. The hook **201**

of FIG. **8c** illustrates this technique as described in U.S. Pat. No. 5,131,119 to Murasaki. FIGS. **8b** show similar configurations but in this case the reinforcing ribs **207** take on the complete shape of the stem **205** in the area where they reinforce the hook. These ribs **207** are positioned only a short way up the stem **205** of the hook **201**. The particular rib configuration, which links together adjacent hooks **201**, as shown in FIG. **8c**, was developed by the hook and loop fastener art to enhance the tear strength of the base **202**. The ribs **207** act as rip stops when tear forces are applied to the base(2) of the hook substrate.

[0041] FIG. **8d** is a drawing of the hook of Ribich as taken from U.S. Pat. No. 3,708,833. It is stated that this hook has an unusual property of being able to engage very efficiently with fibers and loops.

[0042] FIG. **8e** is a cross-sectional view of the hook depicted in FIG. **5C**.

[0043] FIG. **10** is described in the lather generation method provided below.

[0044] In one aspect of the invention is a skin care or cleansing article including but not limited to:

a. an electromechanical device capable of transferring vibratory, oscillatory, rubbing or rotatory motion or a combination thereof;

b. a fastener substrate having a plurality of molded or shaped elements each having a first and a second end, the elements projecting from a base at the first end and having a hook shaped second end, wherein the base is attached to the electromechanical device; and

c. a disposable pad composed of a water insoluble fibrous substrate (preferably where the pad is composed entirely of the fibrous substrate with optional binders) having at least one layer of fibers with an average denier in the range of about 1 to 12 (preferably having a minimum average denier of about 1, 2, 4 or 6 and having a maximum average denier of about 8, 10 or 12), wherein said substrate contains about 0.5 to 3000% by wt. in total concentration based on the dry substrate of at least one of skin conditioning component(s), skin active agent (s), lathering surfactant(s) or a blend thereof (preferably having a minimum of about 50, 100 or 150 and having a maximum of about 500, 600 or 700%), said component(s) being releasably associated with said substrate; said pad being attached to the fastener substrate by way of the hook shaped second end.

[0045] Advantageously the water insoluble fibrous substrate is substantially dry (defined as less than about 5, 4, 3, 2, or 1% by wt. of water) in one embodiment. In another embodiment the water insoluble fibrous substrate is substantially wet (defined as having more than about 5, 10, 15 or 20% by wt. of water).

[0046] Preferably the fastener substrate is characterized by a ratio of the hook height (hh') to the crook width (qq') in the range of about 0.5 to 2.0. Advantageously the fastener substrate has hooks placed in alternating directions (preferably in a palm tree configuration such as is illustrated in FIGS. **5** and **8E**), wherein said crooks are preferably between 0.15 and 0.5 mm in width, between 0.5 and 1.0 mm in height and wherein the hook density is at least 45 hooks/cm² on the base. Preferably the crook width has a minimum dimension of 0.15, 0.25 or 0.35 mm and a maximum dimension of 0.70, 0.80 or 0.90 mm. Preferably the height of the hooks has a minimum dimension of 0.20, 0.25 or 0.30 mm and a maximum dimension of 0.75, 1.0 or 1.25 mm. Preferably the hook density has

a minimum frequency of 35, 40 or 45 hooks/cm² and a maximum frequency of 125, 150 or 175 hooks/cm².

[0047] In a preferred embodiment the fibers are woven or non-woven. Preferably the fibers have an average length in the range of 3 mm to 40 mm (preferably having a minimum length of about 4 mm, 6 mm or 8 mm and having a maximum length of about 20 mm, 25 mm or 28 mm). Advantageously the fibers are entangled, bonded, crimped, knit or woven or having a combination thereof. Preferably the layer is composed of cellulosic fibers, synthetic fibers or a blend thereof. More preferably, the layer has well defined apertures having a major dimension in the range of about 1 mm to 5 mm (preferably having a minimum of about 1 mm, 1.25 mm or 1.5 mm and having a maximum of about 4 mm, 4.5 mm or 5 mm); and a distribution frequency in the range of about 2 to 15 per linear cm (preferably having a minimum frequency of about 2, 4 or 6 and having a maximum frequency of about 8, 10 or 12). Most preferably a second fibrous layer is attached to the at least one layer by any means known in the art or equivalents thereof.

[0048] Advantageously the adhesive strength of the fibrous substrate layer to the fastener substrate is in the range of about 30 g to 300 g (preferably having a minimum of about 75 g, 100 g or 125 g and having a maximum of about 200 g, 225 g or 250 g) using the adhesive test protocol defined below. Preferably the adhesive strength of the second layer to the fastener substrate is in the range of about 200 g to 700 g (preferably having a minimum of about 250 g, 300 g or 350 g and having a maximum of about 500 g, 550 g or 600 g) using the adhesive test protocol.

[0049] In a preferred embodiment the second layer is selected from a fibrous layer, a sponge layer, a reticulated layer, a polymeric netted mesh layer or a combination thereof. Advantageously the second layer is a woven or nonwoven fibrous layer with an average fiber denier in the range of about 4 to 30 (preferably having a minimum average denier of about 4, 6 or 8 and having a maximum average denier of about 12, 14 or 16). Preferably the second layer is composed entirely of cellulosic fibers, synthetic fibers or a blend thereof (with or without optional binders). This would mean that there are no substantial amounts of nonfibrous structure such as sponge, closed or open cell foam, reticulated or molded polymeric or similar structure(s).

[0050] Advantageously the inventive article has a pad capable of generating a lather volume as measured by the standard lather generation test in the range of about 50 ml to 1000 ml (preferably having a minimum of about 75 ml, 125 ml or 175 ml and having a maximum of about 350 ml, 400 ml, 450 ml) as measured by the standard lather test described below.

[0051] Preferably the inventive article is further characterized by an engagement force (as defined below) required to adhere the non-woven to the hook in the range of about 1 g to 200 g (preferably having a minimum of about 1 g, 25 g or 50 g and having a maximum of about 100 g, 150 g or 200 g) to produce an adhesion force of at least 30 g for the fibrous substrate layer (and preferably at least 200 g for the second layer).

[0052] With respect to lathering surfactants, the inventive article preferably has lathering surfactant(s) selected from anionic surfactants (such as C3 to 15 alkyl sarcosinates, C8 to 12 lactylate, sulfosuccinates, or sulfoacetates), nonionic surfactants (such as decyl glucoside, amides, triglycerides, or alkoxyates), amphoteric surfactants (such as cocamidopro-

pyl betaine, amine oxides or sultaines) or a blend thereof. Preferably the anionic surfactant(s) is in the total concentration range of about 5% to 95% w/w based on the dry substrate weight (preferably having a minimum of about 5%, 10% or 15% and having a maximum of about 20%, 25% or 30%); the nonionic surfactant(s) is in the total concentration range of about 5% to 50% (preferably having a minimum of about 5%, 7% or 9% and having a maximum of about 25%, 27% or 30%); and the amphoteric surfactant(s) is in the total concentration range of about 5% to 95% (preferably having a minimum of about 5%, 10% or 15% and having a maximum of about 20%, 25% or 30%)

[0053] In a preferred embodiment, the skin conditioning component(s) is present in the total concentration range of about 0.01% to 50% w/w based on the dry substrate (preferably having a minimum of about 0.1%, 0.25% or 0.5% and having a maximum of about 20%, 25% or 30%). Advantageously the skin conditioning component(s) is/are selected from occlusive emollients such as di and triglyceride oils, silicone oils, mineral oil and nonocclusive emollients such as polyhydric alcohols (glycerin), polyols, etc.). More preferably the inventive article further includes cationic polymer(s) in the total concentration range of about 0.01% to 5% w/w based on the dry substrate weight (preferably having a minimum of about 0.1%, 0.25% or 0.5% and having a maximum of about 1%, 2% or 3%). Advantageously the article includes skin active agent(s) in the total concentration range of about 0.01 to 25% w/w based on the wt. of the dry substrate (preferably having a minimum of about 0.1%, 0.25% or 0.5% and having a maximum of about 10%, 15% or 20%). Preferably the skin active agent(s) is/are selected from antimicrobial and antifungal actives, vitamins, anti-acne actives; anti-wrinkle, anti-skin atrophy and skin repair actives; skin barrier repair actives; non-steroidal cosmetic soothing actives; artificial tanning agents and accelerators; skin lightening actives; sunscreen actives; sebum stimulators; sebum inhibitors; antioxidants; protease inhibitors; skin tightening agents; anti-itch ingredients; hair growth inhibitors; 5-alpha reductase inhibitors; desquamating enzyme enhancers; anti-glycation agents; topical anesthetics, or mixtures thereof;

[0054] In another aspect of the invention is a skin care system package, including but not limited to:

- a plurality of disposable pads as described above;
- an electromechanical device including the fastener substrate as described above for supporting one of the plurality of disposable pads during use; and,
- a container for packaging the electromechanical device and the plurality of disposable pads.

[0055] In another aspect of the invention is a skin care system kit, including but not limited to:

- an electromechanical device capable of transferring vibratory, oscillatory, rubbing or rotatory motion or a combination thereof;
- a fastener substrate having a plurality of molded or shaped elements, each element having a first and an opposed second end, the elements projecting from a base at the first end and having a hook shaped second end, wherein the base is attached to the electromechanical device;
- at least one disposable pad composed of a water insoluble fibrous substrate having at least one layer of fibers with an average denier in the range of about 1 to 12, wherein said substrate contains about 0.5 to 3000% by wt. in total concentration based on the dry substrate of at least one of skin conditioning component(s), skin active agent(s), lathering

surfactant(s) or a blend thereof, said component(s) being releasably associated with said substrate; said at least one disposable pad being capable of attachment to the fastener substrate by way of the hook shaped second end when a user presses the pad against the hook shaped second end of the fastener substrate.

[0056] In a preferred embodiment at least two disposable pads contained in the kit differ in either their lathering surfactant content, skin conditioning component content; and/or skin active agent content. More preferably the kit contains instructions for selecting a pad contained in the kit so as to deliver a customized skin cleansing or care benefit to the skin of the user.

[0057] In a further aspect of the invention is a method for simultaneously cleansing and/or treating and further massaging the skin by a user comprising the steps of in no particular sequence:

- a. contacting the skin with the inventive skin care or cleansing article;
- b. activating the electromechanical portion of said article to provide stimulating effect to the skin; and
- c. allowing the article to remain on the skin for a time sufficient to cleanse and/or treat the skin according to the preferences of the user.

Fastener Substrate:

[0058] Hook fasteners of specific design are used to provide the ability for the user to conveniently attach a fibrous pad impregnated with a skin conditioning component, a skin active agent, a lathering surfactant or a blend thereof to the electromechanical implement of the invention. When the denier of the fibrous pad and the hook geometric profile are in specific relationship described in more detail below, the pad is firmly held by the hook fasteners during use of the skin care and/or cleansing implement so it does not fall off the implement during use, but is readily removed by the user for replacement with a fresh pad after use. The hook fasteners of the present invention have the further advantage that they will not irritate the user's skin if the user inadvertently begins to use the implement without the attached pad, resulting in contacting the skin with the bare hooks.

[0059] Hook fasteners are well known in the art and are often termed "hook and loop" fasteners. The fibers of the water insoluble fibrous substrate of the present invention, advantageously having a specific denier range and take the place of "loops" as that term is conventionally used in the hook and fastener technical field for the instant invention. U.S. Pat. No. 3,009,235, to G. De Mestral, describes a product produced by textile fabricating techniques which is sold under the registered trademark VELCRO®. The hooks of De Mestral are formed when fibrous loops are cut below the apex thereof leaving two fragments, a hook and a straight section of the loop fiber.

[0060] U.S. Pat. No. 4,984,339 to Provost et al., describes a hook design wherein the hook tapers smoothly and continuously downward in width from the sturdy base member to the free end such that a loop engaging the hook in tension with the applied force being substantially normal to the base member, will deform the hook portion resiliently under the applied force to release a fiber, collection of fibers or a loop (hereinafter collectively termed "loop") at a desired applied force such that a loop engaging the hook in shear, with the applied force substantially parallel to the base member, will engage the sturdy base member such that it will not deform to release

a loop engaging the hook in shear at or below the desired applied force. A representative example is illustrated in FIG. 8A.

[0061] U.S. Pat. No. 5,131,119 to Ryuichi Murasaki et al. describes a similar hook element with a gentle slope, a front portion extending at least partially straight from a flat base, a standing portion having at least one side accompanying a reinforcing rib extending from the flat base and a hook head extending forwardly from the standing portion, each hook element having a varying cross section area increasing gradually from the hook head toward the flat base. A representative example is illustrated in FIG. 8C.

[0062] U.S. Pat. No. 3,708,833 to Ribich, describes engaging elements comprising flexible spear-like protuberances each having a stem supported at one end thereof on a base and on the unsupported end of the stem a flexible spear-like head having at least two opposite radial extensions which slope from the end of the stem toward the base and extend away from the stem and are resiliently flexible in a plane parallel to the plane of the stem. A representative example is illustrated in FIG. 8D.

[0063] U.S. Pat. No. 5,339,499 to Kennedy et al., describes plastic molded hook designs suitable for the invention. The hook comprises a flat base, a stem connected from the base and projecting upwards therefrom, a neck portion connecting the stem to a crook portion, the crook portion having at least one lobe projecting from the stem at the neck in a plane generally parallel to the base. The lobe is designed with a continuously decreasing vertical thickness from its base at the neck to its tip. The neck has a width at least equal to the vertical thickness of the lobe at its thickest point. The stem portion has substantially greater lateral thickness than the crook portion and extends from the base upward to the neck from which a thinner crook projects. The width of the stem is also configured with a continuous decreasing width from the neck to the base. The laterally thickened stem projects upwards to the neck which lies above a point on the stem which is the point of stress concentration when the lobe is opened by a loop when two fastener substrates are separated. Kennedy et al. describes another plastic molded hook design suitable for the invention where twin crook lobes project from the neck in opposite directions, the plane of the lobes generally aligned with the machine direction of the hook substrate. The lobes are designed with a continuously decreasing vertical thickness from their base at the neck to their tips. The neck has a width at least equal to two times the vertical thickness of a lobe at its thickest point. The stem portion has substantially greater lateral thickness than the crook portion and extends from the base upward to the neck from which the thinner crooks projects. The width of the stem is also configured with a continuous decreasing width from its base up to the neck. The laterally thickened stem projects upwards to the neck which lies above a point on the stem which is the point of stress concentration when at least one of the lobes is opened by a loop when the fastener substrate is separated from the fibrous pad.

[0064] The closure performance of hook and loop systems is generally evaluated by strength measurements encountered in separating the hook substrate from the loop substrate. Such measurements are referred to as tension when the forces are applied perpendicular to the plane of the base of the fastener substrate and shear when the forces are applied parallel to the plane of the base of the fastener substrate. Shear forces may be applied either along the long dimension of the substrate,

referred to as the machine direction, or perpendicular to the machine direction, referred to as the cross direction. When the substrates are disengaged continuously along their length, or peeled apart, the performance is referred to as peel force. Either measurement can be conveniently used to measure the adhesive force between the fibrous pad and the fastener substrate of the present invention. A method for evaluating the force applied perpendicular to the plane of the base of the fastener substrate is specified in further detail below.

[0065] Another aspect of the performance of a hook and loop system suitable for the present invention relates to the ability of the two companion elements to engage each other and is referred to herein as engagement and engagement force. As used herein, engagement force is the force required to press the fastener substrates together. Once pressed together, the force to separate them is the separation force. Generally speaking, separation force is increased as engagement force increases. The shape of the top of a hook will influence the amount of force required to engage the companion substrates of a hook and loop closure.

Electromechanical Motion Generator for Implement:

[0066] Any electromechanical device that can be contained in or coupled to the inventive skin care and cleansing implement may be used. Preferably the electromechanical device will be contained in the implement. In one embodiment of the present invention, a hand held motorized personal skin care implement is provided having a housing, a battery located in the housing, a motor located in the housing, and a pad support section connected to a drive shaft of the motor. The connection between the drive shaft and the pad support section provides linear reciprocating motion of the pad support section.

[0067] In accordance with another embodiment of the present invention, a hand held personal skin care implement is provided comprising a housing, a battery located in the housing, a motor located in the housing, and a movable pad support section connected to the motor either directly (direct drive) or via a drive train. A drive transmission is preferably provided between the motor and the movable cleaning section that provides one or more different types of motion of the pad support section. If a plurality of types of motion are utilized they are preferably at least partially different from one another. Such types of motion may include vibration, rotation, oscillation in one or more distinct spatial planes or combinations thereof.

[0068] In accordance with another embodiment of the present invention, a hand held personal skin care implement is provided comprising a housing, a battery, a motor, and a pad support section. The battery is located in a handle of the housing. The motor is located in the housing and is electrically connectable to the battery. The pad support section is connected to the motor by a drive transmission. The drive transmission provides an orbital motion of the pad.

[0069] In a further preferred embodiment of the present invention, a hand held personal skin care implement is provided comprising a housing, a battery, a motor and a vibration generator all located in the housing and a pad support section. In a preferred embodiment, the vibration generator may include a weight mounted on an output shaft of the motor as is known in the art. The weight may be configured to be mounted eccentric to the motor axis, thereby causing vibra-

tion when the motor is activated. Any other electrical vibration generator that is sized to fit the implement may be suitably used.

[0070] In another embodiment of the present invention, a hand held personal skin care implement is provided comprising a housing, a battery, a motor, a roller, a pad support section and a pad configured into a belt or an elongated pad that can be formed into a continuous belt. The battery is located in a handle of the housing. The motor is located in the housing and is electrically connectable to the battery. The pad support section is wrapped in continuous fashion around the roller which is connected to the motor by a drive transmission. In operation, the drive transmission rotates the roller, pad support section and pad combination so as to convey a planing-like motion to the skin where the axis of rotation of the roller is approx. parallel to the skin surface.

[0071] In another embodiment of the present invention, a hand held personal skin care implement is provided comprising a housing, a battery, a motor, a plurality of rollers, a pad support section and a pad configured into a belt or an elongated pad that can be formed into a continuous belt. The battery is located in a handle of the housing. The motor is located in the housing and is electrically connectable to the battery. The pad support section is wrapped in continuous fashion around the rollers and the pad is adhered to the pad support section. At least one drive roller is connected to the motor by a drive transmission. In operation, the drive transmission rotates the at least one drive roller which conveys the pad support section and pad combination so as to supply a belt driven sanding-like motion to the skin where the axis of rotation of the roller is approx. parallel to the skin surface.

[0072] Various arrangements and numbers of batteries may be utilized, in various sizes such as, for example, AA or AAA batteries and in both disposable and rechargeable configurations such as Nickel Metal Hydride (NiMH), Lithium-ion (Li-ion), may be used for powering the electromechanical motion generator. Alternatively the implement may be connected to an external power source of any suitable kind. The switch may be any suitable type of switch, such as a push-button switch or a slide switch, as known in the art or equivalents thereof.

Latherability:

[0073] When lathering surfactants are used to impregnate or coat the pad, the lather of the inventive articles is characterized by a rich or creamy appearance. The bubble diameter distribution of a rich or creamy lather is narrow, and substantially uniform, with the mean bubble diameter preferably below about 200 microns. In contrast, the bubble diameter distribution of a loose, bubbly or airy lather is wider, and substantially non-uniform, with the mean bubble diameter above about 200 microns, preferably above about 500 microns. The stability or persistence of the lather of the inventive pads is especially noteworthy and the lather volume is observed to be in the range of about 50 ml to 1000 ml as measured by the standard lather generation test described below for the pad alone.

Water Insoluble Substrate:

[0074] The inventive skin care implement employs a pad with a water insoluble substrate as a component. By "water insoluble" is meant the substrate does not dissolve or readily break apart upon immersion in water. A wide variety of mate-

rials can be used as the substrate. The following non-limiting characteristics are desirable: (i) sufficient wet strength for use, (ii) sufficient abrasivity, (iii) sufficient loft and porosity, (iv) sufficient thickness, and (v) appropriate size.

[0075] Non-limiting examples of suitable insoluble substrates which meet the above criteria include non-woven substrates, woven substrates, hydro-entangled substrates, air entangled substrates and the like. Preferred embodiments employ non-woven substrates since they are economical and readily available in a variety of materials. By non-woven is meant that the layer is comprised of fibers which are not woven into a fabric but rather are formed into a sheet, particularly a tissue. The fibers can either be random (i.e., randomly aligned) or they can be carded (i.e. combed to be oriented in primarily one direction). Furthermore, the non-woven substrate can be composed of a combination of layers of random and carded fibers.

[0076] Non-woven substrates may be comprised of a variety of materials both natural and synthetic. By natural is meant that the materials are derived from plants, animals, insects or byproducts. By synthetic is meant that the materials are obtained primarily from various man-made materials or from material that is usually a fibrous web comprising any of the common synthetic or natural textile-length fibers, or mixtures thereof.

[0077] Non-limiting examples of natural materials useful as components in the present invention are silk fibers, keratin fibers and cellulosic fibers. Non-limiting examples of keratin fibers include those selected from the group consisting of wool fibers, camel hair fibers, and the like. Non-limiting examples of cellulosic fibers include those selected from the group consisting of wood pulp fibers, cotton fibers, hemp fibers, jute fibers, flax fibers, and mixtures thereof. Wood pulp fibers are preferred compared all cotton fibers (e.g. cotton pads) due to their being more expensive.

[0078] Non-limiting examples of synthetic materials useful as components in the present invention include those selected from the group consisting of acetate fibers, acrylic fibers, cellulose ester fibers, modacrylic fibers, polyamide fibers, polyester fibers, polyolefin fibers, polyvinyl alcohol fibers, rayon fibers and mixtures thereof. Examples of some of these synthetic materials include acrylics such as Acrilan[®]), Creslan[®]), and the acrylonitrile-based fiber, Orlon[®]); cellulose ester fibers such as cellulose acetate, Arnel[®], and Acele[®]; polyamides such as Nylons (e.g., Nylon 6, Nylon 66, Nylon 610 and the like; polyesters such as Fortrel[®]), Kodel[®]), and the polyethylene terephthalate fibers, Dacron[®]); polyolefins such as polypropylene, polyethylene; polyvinyl acetate fibers and mixtures thereof.

[0079] Non-woven substrates made from natural materials consist of webs or sheets most commonly formed on a fine wire screen from a liquid suspension of the fibers. Substrates made from natural materials useful in the present invention can be obtained from a wide variety of commercial sources.

[0080] Non-woven substrates made from synthetic material useful in the present invention can also be obtained from a wide variety of commercial sources, such as e.g. Sontaro[®] 8868, a hydro-entangled material, containing about 50% cellulose and about 50% polyester, and having a basis weight of about 60 gsy or 2.2 oz per sq. yard, having rectangular apertures of about 1.5 mm by 2 mm in dimension with about 150 to 160 apertures per sq. inch, available from Dupont Chemical Corp; PGI Lavett fabric, a 2.35 oz/sq. yd., 63% rayon/29% PET/8% binder fabric with rectangular apertures of about 2

mm×3 mm in dimension having about 40 to 45 apertures per square inch from PGI Corporation; Carlee high loft fabric, 2.0 oz/sq.yd., 100% polyester fabric from Carlee Corporation; and KC 5A high loft fabric, approx. 2.5 oz per sq. yard, 100% polyester fabric from Kimberly Clark Corporation. Other useful fabrics that may be used in the invention are as follows: PGI Crevice fabric, at 2.35 oz/sq. yd., 70% rayon or tenvel/30% PET fabric with or without random and inconsistent apertures; HDK Industries 340 high loft (5 oz/sq yd) with 42.5% DuPont 4080 polyester 4 denier/42.5% 4080 polyester 6 denier/15% Tencel 2 denier blend.

[0081] Most preferred as a component substrate for purposes of this invention are non-woven substrates, especially blends of rayon/polyester and ratios of 10:90 to 90:10, preferably ratios of 20:80 to 80:20, optimally 40:60 to 60:40 by weight. A most useful substrate is a 70:30 rayon/polyester non-woven wipe article.

[0082] As an adjunct to the inventive implement, anywhere from 1 to 100, preferably from 5 to 50 single pads may be stored within a dispensing pouch or container, preferably a moisture impermeable pouch or container. During storage and between dispensing, the pouch or container is preferably resealable. Single pad containing pouches may also be employed.

Apertured Fabrics

[0083] The inventive dry skin care wipe may optionally employ at least one apertured fabric, where a pattern is created by a network of bundled fiber segments surrounding apertures or holes; or in a contiguous nonwoven web which has been apertured or provided with slits or other openings. In one preferred embodiment, the water insoluble material is a substantially contiguous network of water insoluble fibers having a plurality of macroscopic openings. A macroscopic opening is defined as an opening that is large relative to the intrinsic pore size of the water insoluble material.

[0084] In a typical spunbond or bonded carded web, for example, a macroscopic opening would appear to the eye to be a deliberately introduced hole or void in the web rather than a characteristic pore between adjacent fibers, and specifically could have a characteristic width of about 1 mm to about 5 mm. A useful characteristic width may be defined as 4 times the area of the aperture divided by the perimeter. Useful fabric aperture densities are about 10 to 700 per square inch, preferably about 20 to 500 per square inch.

[0085] As discussed above, the nonwoven web may be made from synthetic fibers, as is known in the art, and may be a spunbond web, a meltblown web, a bonded carded web, or other fibrous nonwoven structures known in the art. For example, a polyester nonwoven web such as a low basis weight spunbond material could be provided with apertures through pin aperturing; perf embossing and mechanical stretching of the web; die punching or stamping to provide apertures or holes in the web; hydroentangling to impart apertures by rearrangement of the fibers due to the interaction of water jets with the fibrous web as it resides on a patterned, textured or three-dimensional substrate that imparts a pattern to the web; water knives that cut out desired apertures or holes in the web; laser cutters that cut out portions of the web; patterned forming techniques, such as air laying of synthetic fibers on a patterned substrate to impart macroscopic openings; needle punching with sets of barbed needles to engage and displace fibers; and other methods known in the art.

Preferably, the openings are provided in a regular pattern over at least a portion of an outersheet of the absorbent article.

[0086] The water insoluble substrates or fabrics of the present invention can comprise two or more layers, each having a different texture and abrasiveness. The differing textures can result from the use of different combinations of materials or from the use of a substrate having a more abrasive side for exfoliation and a softer, absorbent side for gentle cleansing or skin treatment. In addition, separate layers of the substrate can be manufactured to have different colors, thereby helping the user to further distinguish the surfaces.

[0087] A fabric or sheet may be bonded to at least one other nonwoven sheet of water insoluble fibers ("second sheet") by lamination, adhesives, stitching, fasteners, or other art recognized binding methods. Preferably, the second sheet is attached to a first sheet by means of lamination, adhesives and related agents, including hot melts, latexes, glues, starch, waxes, and the like, which adhere or join the upper regions of the apertured sheet with adjacent portions of the second sheet. Adhesive application can be through meltblown application of hot melt glues and thermoplastic materials, spray or swirl nozzles of melted or dissolved adhesives, printing of adhesive material onto one or both surfaces before joining, and the like. If adhesives are applied directly to the optional apertured sheet by means of spray, mist, aerosol, or droplets in any form, prior to contact of the apertured sheet with the water insoluble matter, then it is desirable to use a template or patterned shield to prevent application of adhesive to the apertures to avoid clogging. Preferably, the second sheet is composed of polyester or a polyester and cellulose blend, does not contain apertures and has the characteristics of high loft, a basis weight of about 1 to 8 ounces per square yard, preferably about 4 to 6 ounces per square yard and optionally contains a binder. Useful optional binders include latex or acrylic materials added to the fabric between about 5 to 40 weight percent of the fabrics total weight, preferably between about 5 to 25 weight percent.

Lathering Surfactant

[0088] The inventive pad optionally contains a lathering surfactant. By a "lathering surfactant" is meant a surfactant, which when combined with water and mechanically agitated generates a foam or lather. Preferably, these lathering surfactants should be mild, which means that they must provide sufficient skin care or detergent benefits but not overly dry the skin or hair, and yet meet the lathering criteria described above.

[0089] The products of the present invention may comprise a lathering surfactant to substrate weight ratio between about 0.005 to 2, preferably between about 0.05 to 1.75, more preferably from about 0.1 to 1.5.

[0090] A wide variety of lathering surfactants are useful herein and include those selected from the group consisting of anionic, nonionic, cationic, amphoteric and lathering surfactant mixtures thereof.

[0091] Among the anionic lathering surfactants useful herein are the following non-limiting examples which include the classes of:

[0092] (1) Alkyl benzene sulfonates in which the alkyl group contains from 9 to 15 carbon atoms, preferably 11 to 14 carbon atoms in straight chain or branched chain configuration. Especially preferred is a linear alkyl benzene sulfonate containing about 12 carbon atoms in the alkyl chain.

[0093] (2) Alkyl sulfates obtained by sulfating an alcohol having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms. The alkyl sulfates have the formula ROSO_3M^+ where R is the C_{8-22} alkyl group and M is a mono- and/or divalent cation.

[0094] (3) Paraffin sulfonates having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms, in the alkyl moiety. These surfactants are commercially available as Hostapur SAS from Hoechst Celanese.

[0095] (4) Olefin sulfonates having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms. Most preferred is sodium $\text{C}_{14}\text{-C}_{16}$ olefin sulfonate, available as Bioterge AS 40®.

(5) Alkyl ether sulfates derived from an alcohol having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms, ethoxylated with less than 30, preferably less than 12, moles of ethylene oxide. Most preferred is sodium lauryl ether sulfate formed from 2 moles average ethoxylation, commercially available as Standapol ES-2®.

[0096] (6) Alkyl glyceryl ether sulfonates having 8 to 22 carbon atoms, preferably 12 to 16 carbon atoms, in the alkyl moiety.

[0097] (7) Fatty acid ester sulfonates of the formula: $\text{R}^1\text{CH}(\text{SO}_3\text{M}^+)\text{CO}_2\text{R}^2$ where R^1 is straight or branched alkyl from about C_8 — to C_{18} , preferably C_{12} to C_{16} , an dR^2 is straight or branched alkyl from about C_1 to C_6 , preferably primarily C_1 , and M^+ represents a mono- or divalent cation.

[0098] (8) Secondary alcohol sulfates having 6 to 18, preferably 8 to 16 carbon atoms.

[0099] (9) Fatty acyl isethionates having from 10 to 22 carbon atoms, with sodium cocoyl isethionate being preferred.

[0100] (10) Dialkyl sulfosuccinates wherein the alkyl groups range from 3 to 20 carbon atoms each.

[0101] (11) Alkanoyl sarcosinates corresponding to the formula $\text{RCON}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{CO}_2\text{M}$ wherein R is alkyl or alkenyl of about 10 to about 20 carbon atoms and M is a water-soluble cation such as ammonium, sodium, potassium and trialkanolammonium. Most preferred is sodium lauroyl sarcosinate.

[0102] (12) Alkyl lactylates wherein the alkyl groups range from 8 to 18 carbon atoms, with sodium lauryl lactylate sold as Pationic 138 C® available from the Patterson Chemical Company as the most preferred.

[0103] (13) Taurates having from 8 to 16 carbon atoms, with cocoyl methyl taurate being preferred.

[0104] Nonionic lathering surfactants suitable for the present invention include $\text{C}_{10}\text{-C}_{20}$ fatty alcohol or acid hydrophobes condensed with from 2 to 100 moles of ethylene oxide or propylene oxide per mole of hydrophobe; $\text{C}_2\text{-C}_{10}$ alkyl phenols condensed with from 2 to 20 moles of alkylene oxides; mono- and di-fatty acid esters of ethylene glycol such as ethylene glycol distearate; fatty acid monoglycerides; sorbitan mono- and di- $\text{C}_8\text{-C}_{20}$ fatty acids; and polyoxyethylene sorbitan available as Polysorbate 80 and Tween 80® as well as combinations of any of the above surfactants.

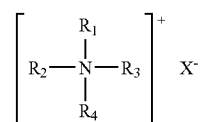
[0105] Other useful nonionic surfactants include alkyl polyglycosides, saccharide fatty amides (e.g. methyl glucosides) as well as long chain tertiary amine oxides. Examples of the latter category are: dimethyldodecylamine oxide, oleyldi(2-hydroxyethyl)amine oxide, dimethyloctylamine oxide, dimethyldodecylamine oxide, dimethyltetradecylamine oxide, di(20-hydroxyethyl)tetradecylamine oxide, 3-didodecyoxy-2-hydroxypropyl di(3-hydroxypropyl)amine oxide, and dimethylhexadecylamine oxide.

[0106] Amphoteric lathering surfactants useful for the present invention include aliphatic secondary and tertiary amines, preferably wherein the nitrogen is in a cationic state, in which the aliphatic radicals can be straight or branched chain and wherein one of the radicals contains an ionizable water solubilizing group such as carboxy, sulphonate, sulphate, phosphate or phosphonate. Illustrative substances are cocoamidopropyl betaine, cocoamphoacetate, cocoamphodi-acetate, cocoamphopropionate, cocoamphodipropionate, cocoamidopropyl hydroxysultaine, cetyl dimethyl betaine, cocoamidopropyl PG-dimonium chloride phosphate, coco dimethyl carboxymethyl betaine, cetyl dimethyl betaine and combinations thereof.

[0107] The amount of lathering surfactant to substrate weight ratio between about 0.005 to 2, preferably between about 0.05 to 1.75, more preferably from about 0.1 to 1.5.

[0108] Cationic conditioning agents in monomeric and polymeric type are also useful for purposes of this invention. Examples of the polymeric type include: cationic cellulose derivatives, cationic starches, copolymers of a diallyl quaternary ammonium salt and an acryl amide, quaternized vinylpyrrolidone, vinylimidazole polymers, polyglycol amine condensates, quaternized collagen polypeptide, polyethylene imine, cationized silicone polymer (e.g. Amodimethicone), cationic silicone polymers provided in a mixture with other components under the trademark Dow Corning 929 (cationized emulsion), copolymers of adipic acid and dimethylaminohydroxypropyl diethylenetriamine, cationic chitin derivatives, cationized guar gum (e.g. Jaguar C-B-S, Jaguar C-17, Jaguar C-16 etc. manufactured by the Celanese Company), quaternary ammonium salt polymers (e.g. Mirapol A-15, Mirapol AD-1, Mirapol AZ-1, etc., manufactured by the Miranol Division of the Rhone Poulenc Company). Most preferred is polyquaternium-11 available as Luviquat® PQ 11 sold by the BASF Corporation.

[0109] Examples of monomeric cationic conditioning agents are salts of the general structure:



Wherein R¹ is selected from an alkyl group having from 12 to 22 carbon atoms, or aromatic, aryl or alkaryl groups having from 12 to 22 carbon atoms; R², R³, and R⁴ are independently selected from hydrogen, an alkyl group having from 1 to 22 carbon atoms, or aromatic, aryl or alkaryl groups having from 12 to 22 carbon atoms; and X⁻ is an anion selected from chloride, bromide, iodide, acetate, phosphate, nitrate, sulfate, methyl sulfate, ethyl sulfate, tosylate, lactylate, citrate, glycolate, and mixtures thereof. Additionally, the alkyl groups can also contain ether linkages, or hydroxy or amino group substituents (e.g. the alkyl groups can contain polyethylene glycol and polypropylene glycol moieties). Preferably the anion is phosphate, especially preferred is hydroxy ethyl cetyl dimonium phosphate available as Luviquat® Mono CP from the BASF Corporation.

[0110] Amino silicone quats may similarly be employed. Most preferred is Silquat AD designated by the CTFA as Silicone Quaternium 8, available from Siltech Inc.

[0111] Amounts of each cationic agent may range from about 0.01 to 5%, preferably from about 0.1 to about 3%, optimally from about 0.2 to about 2.5% by weight of the deposited composition.

Skin Conditioning Compounds:

[0112] Hydrophilic emollients that also are humectants such as polyhydric alcohols, e.g. glycerin and propylene glycol, and the like; and polyols such as polyethylene glycols may be used as skin conditioning compounds.

[0113] Hydrocarbon wax and oil emollients are hydrophobic emollients that are advantageously used in the invention as skin conditioning compounds. Other hydrophobic emollients may also be optionally used.

[0114] The term "emollient" (also termed skin conditioning compounds according to the invention) is defined as a substance which softens or improves the elasticity, appearance, and youthfulness of the skin (stratum corneum) by either increasing its water content, adding, or replacing lipids and other skin nutrients; or both, and keeps it soft by retarding the decrease of its water content.

[0115] Useful hydrophobic emollients include the following:

[0116] (a) silicone oils and modifications thereof such as linear and cyclic polydimethylsiloxanes; amino, alkyl, alkaryl, and aryl silicone oils;

[0117] (b) fats and oils including natural fats and oils such as jojoba, soybean, sunflower, rice bran, avocado, almond, olive, sesame, persic, castor, coconut, mink oils; cacao fat; beef tallow, lard; hardened oils obtained by hydrogenating the aforementioned oils; and synthetic mono, di and triglycerides such as myristic acid glyceride and 2-ethylhexanoic acid glyceride;

[0118] (c) natural waxes such as carnauba, spermaceti, beeswax, lanolin, and derivatives thereof;

[0119] (d) hydrophobic and hydrophilic plant extracts;

[0120] (e) hydrocarbon wax and oil emollients include branched and unbranched hydrocarbons such as petrolatum, mineral oil, microcrystalline waxes, paraffins, ceresin, ozokerite, polyethylene, perhydrosqualene, paraffin oil, pristane, squalane, squalene, and combinations thereof and the like.

[0121] (f) higher fatty acids such as lauric, myristic, palmitic, stearic, behenic, oleic, linoleic, linolenic, lanolic, isostearic, arachidonic and poly unsaturated fatty acids (PUFA);

[0122] (g) higher alcohols such as lauryl, cetyl, stearyl, oleyl, behenyl, cholesterol and 2-hexydecanol alcohol;

[0123] (h) fatty esters such as cetyl octanoate, myristyl lactate, cetyl lactate, isopropyl myristate, myristyl myristate, isopropyl palmitate, isopropyl adipate, butyl stearate, decyl oleate, cholesterol isostearate, glycerol monostearate, glycerol distearate, glycerol tristearate, alkyl lactate, alkyl citrate and alkyl tartrate;

[0124] (i) essential oils and extracts thereof such as *mentha*, jasmine, camphor, white cedar, bitter orange peel, ryu, turpentine, cinnamon, bergamot, *citrus unshiu*, calamus, pine, lavender, bay, clove, hiba, eucalyptus, lemon, starflower, thyme, peppermint, rose, sage, sesame, ginger, basil, juniper, lemon grass, rosemary, rosewood, avocado, grape, grapeseed, myrrh, cucumber, watercress, *calendula*, elder flower, geranium, linden blossom, amaranth, seaweed, ginko, ginseng, carrot, guarana, tea tree, jojoba, comfrey, oatmeal, cocoa, neroli, vanilla, green tea, penny royal, aloe vera, menthol,

cineole, eugenol, citral, citronelle, borneol, linalool, geraniol, evening primrose, camphor, thymol, spirantol, penene, limonene and terpenoid oils;

[0125] (j) mixtures of any of the foregoing components, and the like.

Optional Skin Active Agents

[0126] Advantageously, active agents other than conditioning agents such as emollients or moisturizers defined above may be used alone or added to the skin treatment composition in a safe and effective amount during formulation to treat the skin during the use of the product. These active ingredients may be advantageously selected from antimicrobial and antifungal actives, vitamins, anti-acne actives; anti-wrinkle, anti-skin atrophy and skin repair actives; skin barrier repair actives; non-steroidal cosmetic soothing actives; artificial tanning agents and accelerators; skin lightening actives; sunscreen actives; sebum stimulators; sebum inhibitors; anti-oxidants; protease inhibitors; skin tightening agents; anti-itch ingredients; hair growth inhibitors; 5-alpha reductase inhibitors; desquamating enzyme enhancers; anti-glycation agents; topical anesthetics, or mixtures thereof; and the like.

[0127] These active agents may be selected from water soluble active agents, oil soluble active agents, pharmaceutically-acceptable salts and mixtures thereof. Advantageously the agents will be soluble or dispersible in the skin care composition. The term "active agent" as used herein, means personal care actives which can be used to deliver a benefit to the skin and/or hair and which generally are not used to confer a conditioning benefit, as is conferred by humectants and emollients previously described herein. The term "safe and effective amount" as used herein, means an amount of active agent high enough to modify the condition to be treated or to deliver the desired skin care benefit, but low enough to avoid serious side effects. The term "benefit," as used herein, means the therapeutic, prophylactic, and/or chronic benefits associated with treating a particular condition with one or more of the active agents described herein. What is a safe and effective amount of the active agent ingredient will vary with the specific active agent, the ability of the active to penetrate through the skin, the age, health condition, and skin condition of the user, and other like factors. Preferably the composition of the present invention comprise from about 0.01% to about 50%, more preferably from about 0.05% to about 25%, even more preferably 0.1% to about 10%, and most preferably 0.1% to about 5%, by weight of the active agent component.

[0128] Anti-acne actives can be effective in treating acne vulgaris, a chronic disorder of the pilosebaceous follicles. Nonlimiting examples of useful anti-acne actives include the keratolytics such as salicylic acid (o-hydroxybenzoic acid), derivatives of salicylic acid such as 5-octanoyl salicylic acid and 4-methoxysalicylic acid, and resorcinol; retinoids such as retinoic acid and its derivatives (e.g., cis and trans); sulfur-containing D and L amino acids and their derivatives and salts, particularly their N-acetyl derivatives, mixtures thereof and the like.

[0129] Antimicrobial and antifungal actives can be effective to prevent the proliferation and growth of bacteria and fungi. Nonlimiting examples of antimicrobial and antifungal actives include b-lactam drugs, quinolone drugs, ciprofloxacin, norfloxacin, tetracycline, erythromycin, amikacin, 2,4,4'-trichloro-2'-hydroxy diphenyl ether, 3,4,4'-trichlorobanilide, phenoxyethanol, triclosan; triclocarban; and mixtures thereof and the like.

[0130] Anti-wrinkle, anti-skin atrophy and skin repair actives can be effective in replenishing or rejuvenating the epidermal layer. These actives generally provide these desirable skin care benefits by promoting or maintaining the natural process of desquamation. Nonlimiting examples of anti-wrinkle and anti-skin atrophy actives include vitamins, minerals, and skin nutrients such as milk, vitamins A, E, and K; vitamin alkyl esters, including vitamin C alkyl esters; magnesium, calcium, copper, zinc and other metallic components; retinoic acid and its derivatives (e.g., cis and trans); retinal; retinol; retinyl esters such as retinyl acetate, retinyl palmitate, and retinyl propionate; vitamin B 3 compounds (such as niacinamide and nicotinic acid), alpha hydroxy acids, beta hydroxy acids, e.g. salicylic acid and derivatives thereof (such as 5-octanoyl salicylic acid, heptyloxy 4 salicylic acid, and 4-methoxy salicylic acid); mixtures thereof and the like.

[0131] Skin barrier repair actives are those skin care actives which can help repair and replenish the natural moisture barrier function of the epidermis. Nonlimiting examples of skin barrier repair actives include lipids such as cholesterol, ceramides, sucrose esters and pseudo-ceramides as described in European Patent Specification No. 556,957; ascorbic acid; biotin; biotin esters; phospholipids, mixtures thereof, and the like.

[0132] Non-steroidal cosmetic soothing actives can be effective in preventing or treating inflammation of the skin. The soothing active enhances the skin appearance benefits of the present invention, e.g., such agents contribute to a more uniform and acceptable skin tone or color. Nonlimiting examples of cosmetic soothing agents include the following categories: propionic acid derivatives; acetic acid derivatives; fennamic acid derivatives; mixtures thereof and the like. Many of these cosmetic soothing actives are described in U.S. Pat. No. 4,985,459 to Sunshine et al., issued Jan. 15, 1991, incorporated by reference herein in its entirety.

[0133] Artificial tanning actives can help in simulating a natural suntan by increasing melanin in the skin or by producing the appearance of increased melanin in the skin. Nonlimiting examples of artificial tanning agents and accelerators include dihydroxyacetone; tyrosine; tyrosine esters such as ethyl tyrosinate and glucose tyrosinate; mixtures thereof, and the like.

[0134] Skin lightening actives can actually decrease the amount of melanin in the skin or provide such an effect by other mechanisms. Nonlimiting examples of skin lightening actives useful herein include aloe extract, alpha-glyceryl-L-ascorbic acid, aminotyroxine, ammonium lactate, glycolic acid, hydroquinone, 4 hydroxyanisole, mixtures thereof, and the like.

[0135] Also useful herein are sunscreen actives. A wide variety of sunscreen agents are described in U.S. Pat. No. 5,087,445, to Haffey et al., issued Feb. 11, 1992; U.S. Pat. No. 5,073,372, to Turner et al., issued Dec. 17, 1991; U.S. Pat. No. 5,073,371, to Turner et al. issued Dec. 17, 1991; and Segarin, et al., at Chapter VII, pages 189 et seq., of *Cosmetics Science and Technology*, all of which are incorporated herein by reference in their entirety. Nonlimiting examples of sunscreens which are useful in the compositions of the present invention are those selected from the group consisting of octyl methoxyl cinnamate (Parsol MCX) and butyl methoxy benzoyl-methane (Parsol 1789), 2-ethylhexyl p-methoxycinnamate, 2-ethylhexyl N,N-dimethyl-p-aminobenzoate, p-aminoben-

zoic acid, 2-phenylbenzimidazole-5-sulfonic acid, oxybenzone, mixtures thereof, and the like.

[0136] Sebum stimulators can increase the production of sebum by the sebaceous glands. Nonlimiting examples of sebum stimulating actives include bryonolic acid, dehydroetiandrosterone (DHEA), orizanol, mixtures thereof, and the like.

[0137] Sebum inhibitors can decrease the production of sebum by the sebaceous glands. Nonlimiting examples of useful sebum inhibiting actives include aluminum hydroxy chloride, corticosteroids, dehydroacetic acid and its salts, dichlorophenyl imidazodioxolan (available from Elubiol), mixtures thereof, and the like.

[0138] Also useful as actives in the present invention are protease inhibitors. Protease inhibitors can be divided into two general classes: the proteinases and the peptidases. Proteinases act on specific interior peptide bonds of proteins and peptidases act on peptide bonds adjacent to a free amino or carboxyl group on the end of a protein and thus cleave the protein from the outside. The protease inhibitors suitable for use in the present invention include, but are not limited to, proteinases such as serine proteases, metalloproteases, cysteine proteases, and aspartyl protease, and peptidases, such as carboxypeptidases, dipeptidases and aminopeptidases, mixtures thereof and the like.

[0139] Other useful as active ingredients in the present invention are skin tightening agents. Nonlimiting examples of skin tightening agents which are useful in the compositions of the present invention include monomers which can bind a polymer to the skin such as terpolymers of vinylpyrrolidone, (meth) acrylic acid and a hydrophobic monomer comprised of long chain alkyl(meth) acrylates, mixtures thereof, and the like.

[0140] Active ingredients in the present invention may also include anti-itch ingredients. Suitable examples of anti-itch ingredients which are useful in the compositions of the present invention include hydrocortisone, methdilazine and trimoprazineare, mixtures thereof, and the like.

[0141] Nonlimiting examples of hair growth inhibitors which are useful in the compositions of the present invention include 17 beta estradiol, anti angiogenic steroids, *curcuma* extract, cyclooxygenase inhibitors, evening primrose oil, linoleic acid and the like. Suitable 5-alpha reductase inhibitors such as ethynylestradiol and, genistine mixtures thereof, and the like.

[0142] Nonlimiting examples of desquamating enzyme enhancers which are useful in the compositions of the present invention include alanine, aspartic acid, N methyl serine, serine, trimethyl glycine, mixtures thereof, and the like.

[0143] A nonlimiting example of an anti-glycation agent which is useful in the compositions of the present invention would be Amadorine (available from Barnet Products Distributor), and the like.

Disposable Pad Manufacturing:

[0144] The disposable, single use pads of the present invention are manufactured by separately or simultaneously adding onto or impregnating into a water insoluble substrate one or more of a lathering surfactant (s), skin conditioning agent(s) and skin active agent(s) and a structurant or volatile solvent, and optionally a water insoluble functional agent and wherein the resulting product is optionally substantially dry. By "separately" is meant that the surfactants, skin conditioning and skin active agents can be added sequentially, in any order without first being combined together. By "simultaneously"

is meant that the surfactants, skin conditioning and skin active agents can be added at the same time, with or without first being combined together.

[0145] The surfactant, skin conditioning agents and any optional ingredients can be added onto or impregnated into the water insoluble substrate by any means known to those skilled in the art. For example, addition can be through spraying, laser printing, splashing, dipping, soaking, or coating.

[0146] When water or moisture is used or present in the manufacturing process, the resulting treated substrate may be optionally dried so that it is substantially free of water. The treated substrate can be dried by any means known to those skilled in the art. Non-limiting examples of known drying means include the use of convection ovens, radiant heat sources, microwave ovens, forced air ovens, and heated rollers or cams. Drying also includes air drying without the addition of heat energy, other than that present in the ambient environment. Also, a combination of various drying methods can be used.

[0147] Techniques for coating or impregnating the pad are well known in the art and are not elaborated on here. Preferably, the aqueous liquid composition of the present invention is coated on by means of a process comprising spraying, printing, splashing, dipping, soaking, flood coating, spray coating or metered dosing. More specialized techniques, such as Meyer Rod, floating knife or doctor blade may also be used herein.

[0148] After the coating or impregnating and optionally drying in the case where a volatile solvent is employed, the optional lathering surfactant to substrate weight ratio is advantageously between about 0.005 to 2, preferably between about 0.05 to 1.75, more preferably from about 0.1 to 1.5.

[0149] The pad is then typically packaged in any of the moisture and vapor impermeable packages known in the art.

Method of Using the Treated Wipe Articles

[0150] For treatment of the user's skin or hair, the treated wipe is adhered to the motorized implement by pressing the wipe against the fastener substrate, optionally saturated with water, the implement is then switched on and applied to a surface (e.g., a skin surface) via topical application to release or deposit an effective amount of the aqueous liquid composition to perform the desired skin care or other function. The amount of water-insoluble functional ingredient delivered from the wipe and frequency of topical application can vary widely, depending upon the individual user's needs. With respect to personal application to the skin, such application can range from about once per day to about four times daily, preferably from about twice per day to about three times daily. Number of wipes used per application can range from 1 to about 4 wipes, preferably 1 to about 2 wipes. The amount of water-insoluble functional ingredient deposited on each wipe is generally from about 3.5 mg to about 175 mg per wipe. The treated wipes of the present invention can also be used prophylactically by administering to healthy skin surfaces to guard from or prevent undesired skin conditions and/or infections using the dosing regimen described above.

[0151] Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material ought to be understood as modified by the word "about".

[0152] The following examples will more fully illustrate the embodiments of this invention. All parts, percentages and

proportions referred to herein and in the appended claims are by weight unless otherwise illustrated.

EXAMPLE 1

[0153] Skin care pads according to the present invention may contain cleansing compositions as outlined under Tables 1-2 In the following example, 2 grams of the composition

according to Table 1 is placed on various PGI water insoluble substrates that are thereafter laminated to HDK high-loft, water insoluble substrates as described below. The lather volumes were measured of both the individual coated fabrics alone and the laminated article as an average of 3 replicates respectively until exhaustion of lather production from the fabrics and the laminated article.

TABLE 1

Ingredient	Active %	Process Instructions
<u>PHASE A</u>		
DI Water	26.04	Add to Main Tank and begin heating and mixing.
Glycerin USP	20	
<u>PHASE B</u>		
Polyquaternium-4 (92%) (Celquat L-200)	0.138	Begin mixing glycerin in side tank. Add Celquats and continue mixing until fully dispersed. Add blend to main tank, mix for 5 min
Polyquaternium-10 (Celquat SC230M)	0.40	
Glycerin USP	5.00	
<u>PHASE C</u>		
Sodium Lauroyl Sarcosinate	5.6513	Add ingredients in order listed. Mix until dispersed.
Decyl Polyglucoside (Plantaren 2000 N)	3.075	
Cocamidopropyl Betaine UQS	6.29847	
<u>PHASE D</u>		
Sodium Lauroyl Lactylate	0.2	Blend in side tank and heat to 71 C. Add to main tank.
Decyl Polyglucoside (Plantaren 2000 N)	2.5	
<u>PHASE E</u>		
Silicone Quaternium-8 (SilSense Q-Plus)	0.2	Add each ingredient individually. Add at 43.4 C or less.
DMDM Hydantoin/Iodopropynyl Butylcarbamate (Glydant Plus Liquid)	0.2	
Fragrance	0.2	
Water	q.s. 100	

TABLE 2

Ingredient	Active %	Process Instructions	
<u>PHASE A</u>			
Fragrance	0.5	Blend together in side tank	
Sweet Almond Oil	2		
Mineral Oil 1000 SUS	2		
Lauryl Alcohol	0.50		
Vitamin E Acetate	0.02		
Isocetyl Behenate Extract	0.20		
Vitamin A Palmitate	0.01		
Helianthus Annuus (Hybrid Sunflower) Oil	0.01		
<u>PHASE B</u>			
Calcium Silicate 600	5.75		Add to mix tank. Start mixer. While mixing slowly add Phase A to Phase B avoiding clumps.
<u>PHASE C</u>			
Poloxamer 407 (Pluracare F127 Prill)	3	Add each ingredient to main tank containing Phase A/B. Blend after adding each ingredient and blend thoroughly after adding final ingredients	
Sodium C14-16 Olefin Sulfonate (Bioterge AS-90 Beads)	3.996		
PEG 180/PEG 8000	3		
Disodium Lauryl Sulfosuccinate (Mackanate LO-100)	4		
Lauramidopropyl Betaine (Mackam 1200)	3		
Guar Hydroxypropyltrimonium Chloride (Jaguar C13-S)	0.465		
Sodium Stearoyl Lactylate (Pationic SSL)	2		
Sodium Stearate OP100V (Veg. Derived)	1.96		
Maltodextrin M440	14.76		

TABLE 2-continued

Ingredient	Active %	Process Instructions
<u>PHASE D</u>		
Citric Acid Anhydrous	26.4145	Add to main tank and blend
Sodium Bicarbonate USP #5	26.4145	thoroughly

Fabric Description

[0154] A selection of fabrics useful in the invention with their fiber content and texture is provided in Table 3 below and their latherability results in Table 4 when the solution provided in Table 1 is used:

TABLE 3

Fabric Name	Appearance	Basis wt., denier And Type
PGI Aperture	e.g. Rectangular apertures about 2–3 mm; 40–45 per sq. in.	e.g. 2.92 oz/sq. yd., denier: 1.5, 63% rayon/29% PET/8% binder
HDK High Loft	e.g. High loft, non-apertured	e.g. 4.92 oz/sq.yd., denier: 2–6, 70% polyester, 30% rayon
PGI Crevice	e.g. Flat, random-apertured	e.g. 2.92 oz/sq.yd., denier: 1.5, 65% rayon/35% polyester
PGI Diamond Pattern	e.g. Raised textured, non-apertured	2.9 oz/sq.yd., denier: 1.5, 50 rayon/50% polyester

TABLE 4

Fabric	Lather (mL)
PGI Aperture	39.7
HDK High Loft	54
PGI Crevice	42.1
PGI Diamond Pattern	38.2

TABLE 5

Comparison of inventive and comparative pad attachment substrates A to F.						
	A	B	C	D	E	F
	INVENTIVE	INVENTIVE	COMP	COMP	COMP	COMP
Hook Shape	Palm Tree	J-hook	J-hook	J-hook	J-hook	Mushroom
Hook Height (mm)	0.31	0.64	1	1	0.69	1.24
Hook Width (mm)	0.41 (1)	0.43	0.4	0.25	0.88	0.64
Height:Width Ratio	0.75	1.5	2.5	4	0.78	2
Hooks/cm ²	310	243	45	56	112	120
force to remove pad from hook (1.2–1.5 denier) (gms)	157.99	107.15	65.66	56.64	129.92	80.78

TABLE 5-continued

Comparison of inventive and comparative pad attachment substrates A to F.						
	A	B	C	D	E	F
	INVENTIVE	INVENTIVE	COMP	COMP	COMP	COMP
force to remove pad from hook (4-6 denier) (gms)	>575 (2)	288.7	281.2	276.3	>575(2)	354.82

Notes:

Note:

Pad used is a Dove ® Gentle Exfoliating Cleansing Pillow produced with date code 08106 available from Unilever (Trumbull, NJ). The pad is composed of two layers as follows: PGI Crevice and HDK High Loft Layers that are ultrasonically bonded together to form an oval with dimensions 3.175 in. (major diameter) × 2.25 in. (minor diameter). The ultrasonic seal extends around outer perimeter of pad. 2 g of the formulation of Table 1 is evenly distributed overpad via wicking action.

A: Velcro ® USA 97-hook product

B: 3M - KN3458 hook product

C: Velcro ® USA 90087WMP - General Purpose Hook

D: 3M RF7140 - Scotch ® Reclosable Fastener

E: Velcro ® USA - Industrial Strength Hook (90595)

F: 3M - Medium Mushroom Hook

(1) Two hooks per stem

(2) Maximum force generated prior to testing failure (i.e. sample pulling away from test fixture)

Test Methods:

Lather Test Method

[0155] This test is used to assess lather volume generation. A schematic diagram of a suitable test apparatus is illustrated in FIG. 10.

Methodology:

Materials:

Support sheet

Clamping devices

Funnels

Separatory Funnel marked at 50-ml intervals

Beakers

Pipette with a 4 mm orifice opening.

[0156] ½" Bubble wrap (e.g. S-3930 distributed by Uline Inc. Newark, N.J.

Method:

[0157] Referring to FIG. 10 using the lather generation apparatus (510).

[0158] 1 Pour 200 ml of 38° C. ± 2° C. water (512) contained in funnel (514) at a rate of 5.26 ml/sec through pipette (516) on to the upper edge of bubble wrap (518) fixed in position and supported on sheet (520) and inclined at an angle of 45 degrees from level. Sheet (520) is supported in a fixed position by stand (536).

[0159] 2 Simultaneously, while pouring water (512) over bubble wrap (518), scrub the wetted bubble wrap (518) with pad (522) in an oscillatory fashion using approximately 15 cm strokes while applying a low level of force pressing the pad to the wrap (approximately ¼ lbs) with

sufficient frequency so that 60-70 up and down strokes are completed before the 200 mls of water (512) has passed over bubble wrap (518).

[0160] 3 Pour an additional 100-ml of 38° C. ± 5° C. water (512) on to the upper edge of bubble wrap (518) in step 2 to collect Lather (530) in separatory funnel (526) via funnel (524) while stopcock (532) is closed.

[0161] 4 Slowly rotate stopcock (532) so as to release water (528) from the bottom of separatory funnel (526). When all of the water (528) is removed, close stopcock (532) and read lather (530) volume in mls.

Note: Bubble wrap (518) should be replaced after 10 tests with a new sheet.

Hook/Pad Adherence Test Method:

Materials:

Instron Tensile Testing Machine (model no 4501)

10N Grip

[0162] 1"×4" hook samples

3M Double Coated Urethane Foam Tape 4016

Dove Gentle Exfoliating Cleansing Pillows (production date Aug. 10, 2006 or later)

[0163] 200 g weight

Test Parameters:

Load Cell Speed—100 mm/min in a downward motion

No Maximum Load

Procedure:

[0164] 1. Adhere hook sample to Load Cell Plate using Double Sided Foam Tape cut to same length and width as hook sample.

[0165] 2. Place pad lengthwise along the hook product and adhere by setting 200 g weight on top of pad (engagement force). Remove weight from pad, and raise Load Cell Plate to the height of the bottom of the grip.

[0166] 3. Clamp grip onto pad without dislodging pad from hook.

[0167] 4. Force is then zeroed on the equipment.

[0168] 5. The Load Cell is then activated to move downward at the preset speed of 100 mm/min, allowing the grip to remove the pad from the hook and measure the grams of force needed to do so.

[0169] The foregoing description and examples illustrate selected embodiments of the present invention. In light thereof variations and modifications will be suggested to one skilled in the art, all of which are within the scope and spirit of this invention.

We claim:

1. A skin care and/or cleansing article comprising:
 - a. an electromechanical device capable of transferring vibratory, oscillatory, rubbing or rotatory motion or a combination thereof;
 - b. a fastener substrate having a plurality of molded or shaped elements each having a first and a second end, the elements projecting from a base at the first end and having a hook shaped second end, wherein the base is attached to the electromechanical device; and
 - c. a disposable pad composed of a water insoluble fibrous substrate having at least one layer of fibers with an average denier in the range of about 1 to 12, wherein said substrate contains about 0.5 to 3000% by wt. in total concentration based on the dry substrate of at least one of skin conditioning component(s), skin active agent(s), lathering surfactant(s) or a blend thereof, said component(s) being releasably associated with said substrate; said pad being attached to the fastener substrate by way of the hook shaped second end.
2. The article of claim 1 wherein said water insoluble fibrous substrate is substantially dry.
3. The article of claim 1 wherein said water insoluble fibrous substrate is substantially wet.
4. The article of claim 1 wherein a ratio of the hook height to the crook width is in the range of about 0.5 to 2.0.
5. The article of claim 1 wherein the fastener substrate has hooks placed in alternating directions, wherein said crooks are between about 0.15 and 0.5 mm in width, between about 0.5 and 1.0 mm in height and having a hook density of at least about 45 hooks/cm².
6. The article of claim 1 wherein said fibers are woven or non-woven.
7. The article of claim 1 wherein said fibers have an average length in the range about 3 mm to 40 mm.
8. The article of claim 1 wherein said fibers are entangled, bonded, crimped, knit or woven or are characterized by a combination thereof.
9. The article of claim 1, wherein the layer is composed of cellulosic fibers, synthetic fibers or a blend thereof.
10. The article of claim 1 wherein the layer has well defined apertures having a major dimension in the range of about 1 mm to 5 mm; and a distribution frequency in the range of about 2 to 15 per linear cm.
11. The article of claim 1 further comprising a second fibrous layer attached to the at least one layer.

12. The article of claim 1 wherein the adhesive strength of said layer to the fastener substrate is in the range of about 30 g to 300 g using the adhesive test protocol.

13. The article of claim 11 wherein the adhesive strength of said second layer to the fastener substrate is in the range of about 200 g to 700 g using the adhesive test protocol.

14. The article of claim 11 wherein the second layer is selected from a fibrous layer, a sponge layer, a reticulated layer, a polymeric netted mesh layer or a combination thereof.

15. The article of claim 11 wherein said second layer is a woven or nonwoven fibrous layer with an average fiber denier in the range of about 4 to 30.

16. The article of claim 11 wherein the second layer is composed entirely of cellulosic fibers, synthetic fibers or a blend thereof.

17. The article of claim 1 wherein the pad is further characterized by a lather volume as measured by the standard lather generation test in the range of about 50 ml to 1000 ml.

18. The article of claim 1 further characterized by an engagement force required to adhere the non-woven to the hook in the range of about 1 g to 200 g to produce an adhesion force of at least 30 gms for the first layer.

19. The article of claim 1 wherein the lathering surfactant (s) is/are selected from anionic surfactants, nonionic surfactants, amphoteric surfactants or a blend thereof.

20. The article of claim 19 wherein the anionic surfactant (s) is in the total concentration range of about 5% to 95% w/w based on the dry substrate weight, the nonionic surfactant(s) is in the total concentration range of about 5% to 50%; and the amphoteric surfactant(s) is in the total concentration range of about 5% to 95%.

21. The article of claim 1 wherein the skin conditioning component(s) in the total concentration range of about 0.01% to 50% w/w based on the dry substrate.

22. The article of claim 1 wherein the skin conditioning component(s) is/are selected from occlusive emollients and nonocclusive emollients.

23. The article of claim 1 further comprising cationic polymer(s) in the total concentration range of about 0.01% to 5% w/w based on the dry substrate weight.

24. The article of claim 1 wherein the skin active agent(s) is/are in the total concentration range of about 0.01 to 25% w/w based on the wt. of the dry substrate.

25. The article of claim 1 wherein the skin active agent(s) is/are selected from antimicrobial and antifungal actives, vitamins, anti-acne actives; anti-wrinkle, anti-skin atrophy and skin repair actives; skin barrier repair actives; non-steroidal cosmetic soothing actives; artificial tanning agents and accelerators; skin lightening actives; sunscreen actives; sebum stimulators; sebum inhibitors; anti-oxidants; protease inhibitors; skin tightening agents; anti-itch ingredients; hair growth inhibitors; 5-alpha reductase inhibitors; desquamating enzyme enhancers; anti-glycation agents; topical anesthetics, or mixtures thereof;

26. A skin care system package, comprising:

- a. a plurality of disposable pads as recited in claim 1;
- b. an electromechanical device including the fastener substrate as recited in claim 1 for supporting one of the plurality of disposable pads during use; and
- c. a container for packaging the electromechanical device and the plurality of disposable pads.

27. A skin care system kit, comprising:

- a. an electromechanical device capable of transferring vibratory, oscillatory, rubbing or rotatory motion or a combination thereof;
- b. a fastener substrate having a plurality of molded or shaped elements, each element having a first and an opposed second end, the elements projecting from a base at the first end and having a hook shaped second end, wherein the base is attached to the electromechanical device;
- c. at least one disposable pad composed of a water insoluble fibrous substrate having at least one layer of fibers with an average denier in the range of about 1 to 12, wherein said substrate contains about 0.5 to 3000% by wt. in total concentration based on the dry substrate of at least one of skin conditioning component(s), skin active agent(s), lathering surfactant(s) or a blend thereof, said component(s) being releasably associated with said substrate; said at least one disposable pad being capable of attachment to the fastener substrate by way of the

hook shaped second end when a user presses the pad against the hook shaped second end of the fastener substrate.

28. The kit of claim 27 wherein at least two pads contained in the kit differ in either their lathering surfactant content, skin conditioning agent content; and/or skin active agent content.

29. The kit of claim 28 further comprising instructions for selecting a pad contained in the kit so as to deliver a customized skin cleansing or care benefit to the skin of the user.

30. A method for simultaneously cleansing and/or treating and massaging the skin by a user comprising the steps of in no particular sequence:

- a. contacting the skin with the skin care or cleansing article as recited in claim 1;
- b. activating the electromechanical portion of said article to provide stimulating motion to the skin; and
- c. allowing the article to remain on the skin for a time sufficient to cleanse and/or treat the skin according to the preferences of the user.

* * * * *