Bathroom Products;

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The bathroom is the one room in the home where every member of the family has privacy and where products for body maintenance and repair are as much used as those for shower and bath. Thus, bathroom products may be as diverse as depilatories, anti-everything from acne to cellulite to stretch marks, and for breast enhancing, body contouring and foot pampering.

A look at patents granted over the last twelve months reveals more activity in shower and tap design than in personal care product formulation but the underlying trend continues to be towards mild and multi-functional products. This was also reflected by offerings at Formulate 2005 where several presentations described mild surfactant systems for shower and bath.

That by Jackie Searle, Cognis, was entitled Fantasy Foams and Searle said that in personal cleansing products, the foam aids physical removal of dirt from skin and hair, enhances fragrance release and demonstrates the availability of the cleansing agent to do the job, enabling the consumer to make a subjective assessment of the products value. Sensual perception is based on visual appearance, tactile impression; rheological performance and skin feel throughout application. Modern surfactants are designed to be compatible with skin and mucous membranes, be readily biodegradable and to give extra performance in moisturising and skin softening as well as provide copious quantities of rich, creamy foam.

Searle suggested anionic polyglucosides provide many of the functions expected by the consumer and described the properties of Cognis Plantapon LGC Sorb, a mixture of sodium lauryl glucose carboxylate and lauryl glucoside, which is mild in use and has excellent foaming properties. These are enhanced if the material is used in combination with Plantapon LC7, INCI: Laureth-7 citrate, which is exceptionally mild, has proven moisturising properties and improves foam richness and stability.

Mild surfactant systems are often difficult to thicken and this was the theme of a presentation by Steve Housley, Uniqema, also at Formulate 2005, who described the properties of Promidium LTS, a mixture of PEG-150 distearate with hydroxyethyl cocamide. The presence of hydroxyethyl cocamide is claimed to overcome the rheological problems associated with PEG-150 distearate and, because it is available in liquid form, it is simple to use in the processing environment.

Trevor Baker, Cornelius, suggested a moisturising shower gel based on Octacare SM2030, which may be used at 6% to solubilise 4% of a natural wax blend in a standard shower gel base. Cecile Tallebois, ISP, described shower foam for pump application with sodium laureth sulfate (SLES) as the primary surfactant, Ceraphyl RMT, INCI: Castoryl maleate, as a moisturising additive and Polyquaternium-11 as a skin conditioning agent. Tallebois also suggested the use of ISP Captivate HC00, an encapsulated form of glitter in dimethicone that is substantive to skin for a sparkling after-shower effect. For adding sparkle to the product itself S.Black suggests the use of Ronastar Blue Sparks or Ronastar Gold Sparks, suspended using xanthan gum.

An alternative thickening and suspending agent is Aqua SF-1 from Noveon. This is added to shower gels and bath additives at about 5% to give clear products with excellent suspending power for materials such as mica-based pearls and interference colours. Another Noveon product, Carbopol Ultrez 21 Copolymer is suggested for a clear bath product containing botanical extracts plus mineral oil encapsulated in gelatine beads, which are held in suspension until added to the bath water, when the gelatine dissolves and the oil is released. Cardinal Health, previously R.P. Scherer, provide countless alternatives materials encapsulated in gelatine and gelatine-free formats.

Multi-tasking is a current buzz-word. It is well-known that females are good at it while men are not but it is also expected of cosmetic products. A shower gel that hides wrinkles is described in USP 6,946,147, which claims that it is possible to incorporate encapsulated optically-activated particles into shower gels and personal cleansing compositions that are able to both scatter and absorb light in a diffuse manner. They remain on the skin and reduce the visual perception of skin imperfections, including cellulite, wrinkles, shadows, and skin discolorations.

Multi-tasking shampoos have been with us for two decades or more so it is somewhat surprising that the same technology has only recently been transferred to products for the skin.

USP 6,908,889 claims novel "two-in-one" detergent compositions comprised of at least one water soluble silicone agent, at least one cationic conditioning agent, and a detergent suitable for use in shampoos, baths, and shower gels. For use in shower products for depositing benefits on the skin the preferred silicone compounds are silicone quaternium-13 and cetyl triethylmonium dimethicone copolyol phthalate and the preferred cationic materials are guar hydroxypropyltrimonium chloride or acrylamidopropyltrimonium chloride/acrylamide copolymer.

The surfactant system can be almost any in current use and is used to deposit hydrophobic benefit agents onto the skin surface and it is claimed that there is a synergistic effect on the permeation of hydrophobic benefit agents in combination with cationic agents and water-soluble silicones. The patent is incredibly wide-ranging and a rich source of named active ingredients for treating almost any hair, nail or skin condition. One embodiment describes the use of hair-growth inhibiting agents in a shower gel for reducing the rate of growth of body hair. Other embodiments describe anti-acne compositions, exfoliants, sunscreens, treatments for seborrhoeic dermatitis, and psoriasis, artificial tanning products, skin lightening products, depilatories and many others.

Shower gels with moisturising action are the most common form of multi-tasking shower products. Jojoba oil is a popular additive for cosmetic products but is very difficult to incorporate into surfactant systems. USP 6,800,736 describes the development of a water-soluble version of jojoba as hydrolysed jojoba in the form of an aqueous dispersion containing a mixture of amino acids, peptides and protein fractions derived from the hydrolysis of naturally occurring jojoba protein. Among the many examples for its use that illustrate the patent is a moisturising body wash containing 5% of the water-soluble jojoba protein.

Another commonly sought additional property for personal cleansing compositions is anti-bacteria effectiveness. USP 6,977,082 describes such compositions that utilise either Triclosan or p-chloro-m-xylenol (PCMX) or a mixture of the two. The formulation contains a nonionic surfactant, an ampholytic surfactant, possibly a cationic surfactant, a hydrotrope and a water-soluble hydric solvent. The preferred ampholytic surfactant is lauramine oxide and the preferred cationic material is stearamidopropyl PG-dimonium chloride. A hydrotrope increases the water solubility of other compounds and an example is ammonium xylene sulfonate. Hydric solvents have between one and three hydroxyl groups and include the lower alcohols and liquid glycols. Dipropylene glycol is a good example of this class of material. These ingredients are added to a conventional SLES/CAPB combination for shower gels and the patent contains much useful information on maximising the deposition of the antibacterial compounds and improving antibacterial effect.

Previous features on bathroom products and surfactants have described the various surfactants available with an emphasis on achieving mildness. The remainder of this article is about some of the other personal care products to be found behind the bathroom door, particularly exfoliants and anti-cellulite treatments.

Exfoliation is a method of removing dead skin cells or corneocytes, from the stratum corneum. The stratum corneum (SC) consists of approximately fourteen layers of corneocytes. In normal skin it takes about fourteen days for freshly formed corneocytes in the lower layer of the SC to reach the outermost layer, where they are naturally shed or exfoliated by a process called desquamation. It is thought that by increasing the natural desquamation rate and thus exposing lower layers of the stratum corneum, the appearance of the skin will be improved. There are many ways of achieving this, including the use of abrasive pads, products that include abrasives and chemical peeling agents such as alpha hydroxy acids (AHAs).

An exfoliating composition suitable for use in the shower is the subject of patent USP 6,294,179, which describes a shower gel based on conventional surfactants that is thickened with Laponite XLS, which enables the suspension of fine abrasive particles of calcite. The viscosity of the product is approximately 12,000 mPas at ambient temperature but it is very shear thinning, therefore particles are suspended when the product is at rest but are readily spread on the body in use. The mean particle size of the calcite is less than 250 microns, with at least 55% being less than 150 microns.

Two patents covered the use of materials as an alternative to abrasives and AHAs for exfoliation. USP 6,753,020 proposed the use of an oat extract containing less than 0.01% beta-glucan in a composition free of AHAs and other known exfoliating agents and at a pH between 6 and 8. The extract suggested is a hydro-glycolic one and 5% extract in a composition appears to be only slightly less effective than 5% lactic acid with a significant reduction in stinging in controlled experiments. USP 6,645,514 relates to the use of water-soluble vitamin E as an exfoliating aid that is effective between pH 4.5 – 9.0. It claims that a topical application of sodium Vitamin E phosphate, (Sodium tocopheryl phosphate), when

used at 2% at pH 7.9 increases the rate of cell exfoliation by about 20% with little stinging or irritation.

Products for body firming and reducing cellulite are applied to large areas of the body in either the beauty salon or home bathroom. Cellulite is caused by defects in the skin that result in the skin having an "orange peel" or "cottage cheese" effect. It is characterised by dermal deterioration due to a breakdown in blood vessel integrity and a loss of capillary networks in the dermal and sub-dermal levels of the skin. The vascular deterioration tends to decrease dermal metabolism and this hinders protein synthesis and repair processes, which results in dermal thinning. The condition is further characterised by fat cells becoming engorged with lipids, swelling, and clumping together, as well as excess fluid retention in the dermal and sub-dermal regions of the skin.

The science behind anti-cellulite products is usually directed towards reducing the water content of fat cells, improving blood circulation and breaking up the deposits of adipose tissue. Massage techniques are used in beauty salons to improve lymphatic drainage and assist the cosmetic compositions. Xanthines, which include caffeine, theophylline, and aminophylline, have diuretic properties that reduce cell water content and the size of the fat cells but unfortunately this water content is readily replenished.

Blood circulation may be improved by the addition of vasodilatory compounds such as Zingiber officinalis (ginger) root oil, Cinnamomum zeylanicum oil and Curcuma zedoaria (zedoary) oil. These are available from Paroxite as a balanced mixture called Zedomina, which is incorporated in a suitable vehicle for topical application and its effect is improved by gentle massage. Eugenia caryophyllus (clove) oil, Piper nigrum (black pepper) oil and nicotinic acid salts and esters are also used.

Lipolysis is the body’s mechanism for converting triglycerides to energy. The process is stimulated by the release of a hormone which in turn sends a chemical signal to the lipase enzyme. The chemical signal is cyclic adenosine monophosphate (cAMP) and some products have relied on prolonging the release of cAMP in order to further stimulate the metabolism of the fatty deposits in the areas of application. The xanthine derivatives mimic the cAMP molecule and thus increase lipolysis and Exsymol have combined these materials with silanols to provide active ingredients to promote lipolysis. They are trade named Algisium C, Theophyllisilane C and Cafeisilane C and respectively their INCI designations are methylsilanetriol mannuronate, methylsilanol carboxymethyl theophillane alginate and methylsilanol mannuronate with caffeine.

Many materials claimed to break up or metabolise the fatty deposits are natural-based. One from Quest, trade named Actisculpt is a mixture of Commiphora mukul resin extract and Coleus forskohlii root extract in dipropylene glycol. It is said to encourage fat lipolysis within adipocytes and promote triglyceride removal. Other actives include seaweed extracts from Biotech Marine, a multi-botanical mix from Provital, one based on red clover, cocoa and green tea from Active Concepts and a blend of bioflavonoids, algae, PEG/PPG-18/18 dimethicone, Centella asiatica, carnitine, caffeine, TEA salicylate and panthenol from LCW Sensient.

Nor has patent activity been lacking: USP 6,071,526 claims the use of aromatase inhibitors and anti-estrogens obtained from oxidised soy glycins. USP 5,972340 claims an aromatherapy composition based on plants, comprising 0.5 to 5% seaweeds, 0.8 to 8% creeping ivy, 0.3 to 3% horsetail, 0.5 to 5% fenugreek, 0.5 to 5% mallows, 0.3 to 3% witch hazel, 0.4 to 4% wheatgerm oil and 0.2 to 2% camphor in a suitable base. USP 6,852,343 claims an active agent extracted from Allium sativum (garlic) bulbs, which is said to prevent the proliferation of adipocytes, and USP 5,591,437 claims the use of black horehound extract, Ballota nigra, in association with caffeine, an extract of ivy (Hedera hellix) or an extract of Coleus forskohlii.

Finally we should not forget that nothing in the bathroom is as relaxing as a pleasantly fragranced hot bath. USP 6,906,017 describes a bath product comprising halite and a mixture of herbs and spices packed in water permeable bath bags to condition bath water and emit fragrances. There are five bags in a retail pack; four of the bags contain a mixture of ground lemongrass, wrinkled skin lime, wrinkled skin lime leaves, holy basil, Zingiber cassumunar and mint and one contains halite. It is claimed that when the water permeable bags are placed in bath water, the mixture releases fragrances that are calming to the bather, and the water is conditioned to soothe and relax muscles, facilitate breathing, exfoliate skin and relieve dry skin. The conditioned water is also beneficial for relieving eczema, psoriasis, postpartum aches, and alleviating the symptoms associated with sinus infection. Halite is sodium chloride and the preferred source is sea salt obtained by evaporation of sea water. Personally I think an alternative name should be sought for wrinkled skin lime if the product is to be a commercial success.

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