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(54) COSMETOLOGIC AND ANTI-AGEING STOCKING OR TIGHTS IMPREGNATED WITH SLOW-RELEASE NATURAL SUBSTANCES AND METHOD FOR MAKING SAME

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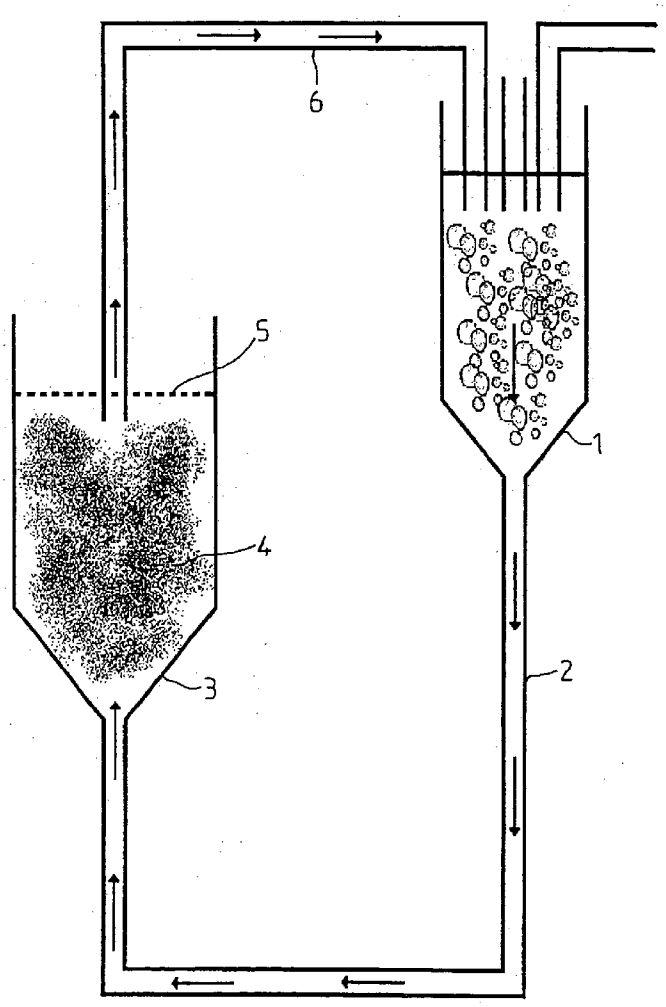
(57) **ABSTRACT**

The invention concerns a cosmetologic and anti-ageing stocking or a pair of tights, or any textile support in direct contact with the skin, impregnated with slow-release natural substances and the method for making same. The combination of biomimetic phospholipid components is as follows: A) GLA Phospholipid (Sodium Borageamidopropyl PG-Dimonium Chloride Phosphate) at 0,5% of the solution; B) PTC Phospholipid (Cocamidopropyl PG-Dimonium Chloride Phosphate) at 1.5% of the solution. Said combination of phospholipid components primarily promotes the fixing or impregnation of the active principles through an electrostatic process and secondarily constitutes an antibacterial agent which controls the bacterial flora. To those two components are added the natural substances to the active principle for a maximum total of 2.10%. The softening and impregnating phase lasts about 35 minutes at a temperature ranging between 35° C. and 37° C.



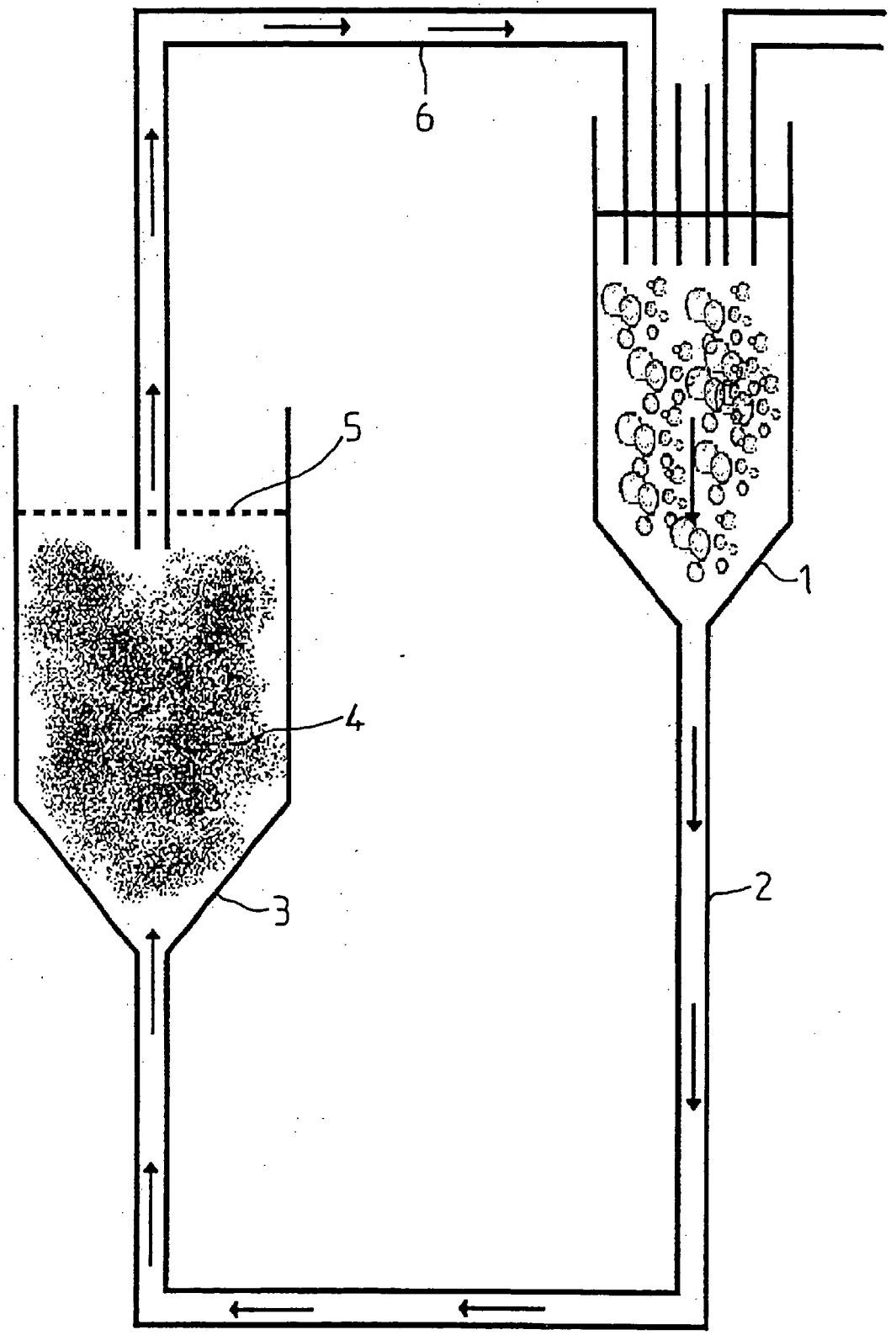


FIGURE 1

COSMETOLOGIC AND ANTI-AGEING STOCKING OR TIGHTS IMPREGNATED WITH SLOW-RELEASE NATURAL SUBSTANCES AND METHOD FOR MAKING SAME

[0001] The invention has for its object stockings or tights, or any textile supporting direct contact with the skin, cosmetological and anti-aging, impregnated with slow release natural substances and its process for production.

[0002] According to the invention, the natural substances or active principles are contained according to one embodiment in the extracts of algae and iridaceae.

[0003] Algal extracts have the function of oxygenating tissues of the skin and increasing the elasticity of the skin.

[0004] The iridaceae extracts supply zinc and vitamin A. Zinc as a coenzyme takes part in the enzymatic reactions taking place during cellular growth and regeneration of the damaged tissues by actuating the cicatrization process.

[0005] Vitamin A is one of the essential agents for cellular growth by inducing cellular multiplication.

[0006] The algal and iridaceae extracts act in synergy to have an anti-radicular action.

[0007] The algal extracts are extracts of *ulva lactuca*. The extracts of this alga protect and reinforce the elastic properties of the skin.

[0008] The invention also has for its object the process of production which permits impregnating stockings or tights, or any textile support in direct contact with the skin, with natural slow release substances.

[0009] The production process consists, after the dyeing phase, acting at the time of the softening process by incorporating in the conventional softening bath a combination of biomimetic phospholipids.

[0010] The combination of the biomimetic phospholipid components is as follows:

[0011] A) Phospholipid GLA (Sodium Borageamidopropyl PG-Dimonium Chloride Phosphate) at 0.5% of the bath

[0012] B) Phospholipid PTC (Cocamidopropyl PG-Dimonium Chloride Phosphate) at 1.5% of the bath

[0013] This combination of phospholipid components has the first function of promoting fixing or impregnation of the active principles by an electrostatic process and a second function of being an antibacterial agent which control the bacterial flora.

[0014] To these two phospholipid components are added substances natural to the active principle for a total maximum of 2.10%. The softening and impregnation phase lasts for about 35 minutes at a temperature comprised between 35° C. and 37° C.

[0015] The proportion of softening solution, including the phospholipid compounds, the active products, must be a proportion of 10 to 1, which is to say for 10 kg of solution, one kilogram of fixative must circulate in the bath.

[0016] According to a preferred embodiment, the active principles or natural substances are the following:

[0017] A) Marine algae from 0.7% to 1.00% maximum

[0018] B) *Uva Lactuca* from 0.3% to 0.5% maximum

[0019] C) Iris *Florentina* from 0.3% to 0.5% maximum

[0020] D) Perfume up to 0.1%

[0021] For a total maximum of 2.1%.

[0022] According to another embodiment, the active principles are the following:

[0023] A) Ginseng from 0.25% to 0.35% maximum

[0024] B) *Ginko Biloba* from 0.25% to 0.35% maximum

[0025] C) Hydrocotyl from 0.25% to 0.35% maximum

[0026] D) Green tea from 0.25% to 0.35% maximum

[0027] E) Aloes (*Aloe Vera*) from 0.50% to 0.70% maximum

[0028] For a maximum total of 2.10%.

[0029] General Description of the Invention:

[0030] Properties of marine algae and floral extracts and their effect on a new generation of tights or any textile support in direct contact with the skin.

[0031] The invention relates to the properties of the tights, or any textile support in direct contact with the skin, permitting using substances contained in algal and iridaceae extracts which, during repeated use, are released in contact with the skin.

[0032] These stockings and tights, or any textile support in direct contact with the skin, offer a cosmetic advantage of the mollifying, decongestant, hydrating and above all anti-aging type, properties obtained by the substances contained in the algal and iridaceae extracts. They also enjoy synergetic efficacy, of these substances alone or associated with other ingredients and those used in their process of production.

[0033] The algae belong to a group of chlorophyll thallophytes, which is to say the large family of cryptogams or plants without flowers, generally classed with respect to color: green algae (chlorophytes), brown algae (pheophytes), red algae (rhodophytes), and blue algae (cyanophytes).

[0034] Rich in vitamins, mineral salts, anti-oxidants, capable of binding and promoting the elimination of polluting substances, they stimulate the metabolism thanks to their iodine content. They contribute to improving the general physical appearance.

[0035] The algae are used in numerous forms in the industrial and agricultural fields. Moreover, they play a nutritional role in the treatment of certain afflictions due to nutritional deficiencies and/or connected with metabolic disequilibria. Given the high content of iodine, certain

brown algae (*laminar* and *fucus*) were already used in the 17th century in the treatment of goiter and in the Basedow sickness.

[0036] These different physiological effects explain the prescription of algae in maladies and syndromes such as:

[0037] metabolic troubles as to iodine,

[0038] organic deficiencies,

[0039] vitamin or oligo-element deficit,

[0040] Rickets, obesity,

[0041] rheumatism, arteriosclerosis,

[0042] different infections,

[0043] intestinal parasites,

[0044] certain troubles of the urinary tract,

[0045] gastritis, colitis,

[0046] circulatory troubles.

[0047] In addition to the nutritional properties, the algae find increasing use also in cosmetic care, in particular for their molifying, emolient and purifying qualities.

[0048] There follow certain algae very often used and the functions attributed to them:

[0049] Appellation: *Ulva Lactuca*, or sea lettuce

[0050] Provenance: Mediterranean

[0051] Principal ingredients and indications: Vitamin A, for protection of the skin and in the treatment of acne.

[0052] Appellation: *Fucus*, or sea oak

[0053] Provenance: Atlantic coasts

[0054] Principal ingredients and indications: minerals, particularly iodine (stimulates the metabolism) alginates (hydratants for external use), proteins, betacarotene, E group vitamins (anti-aging) for thinning regimes and to counter the unsightly effects of cellulite, in creams and masks against cutaneous aging.

[0055] Appellation: *Kelp*

[0056] Provenance: Norway

[0057] Principal ingredients and indications: calcium, potassium, vitamins, minerals and mucillages such as hydratants for topical use and also in thinning regimes.

[0058] Appellation: *Laminar*, or Kombu

[0059] Provenance: Japan

[0060] Principal ingredients and indications: minerals, iodine, iron, calcium and magnesium with disintoxicating action, with decrease of the cutaneous impurities and for slowing the aging of the skin.

[0061] Appellation: *Wakame*

[0062] Provenance: Japan

[0063] Principal ingredients and indications: magnesium, iron, calcium and vitamins A, B, C to optimize the condition of the skin and cutaneous regions: hair and nails.

[0064] Appellation: *Arame*

[0065] Provenance: Japan

[0066] Principal ingredients and indications: iodine and calcium indicated for thinning regimes and face care.

[0067] Appellation: *Nori*

[0068] Provenance: Korea

[0069] Principal ingredients and indications: proteins, betacarotene and iodine which give elasticity and brightness to the skin.

[0070] Appellation: *Dulse*

[0071] Provenance: Northern Europe

[0072] Principal ingredients and indications: iron and iodine used in thinning regimes

[0073] Appellation: *Spirulina*

[0074] Provenance: China, chlorophyll soft water mirrors and vitamins

[0075] Principal ingredients and indications: stripping of iodine, anti-intoxicant and purifier of the organism, gives brightness to the skin and is useful in thinning regimes.

[0076] Appellation: *Klamath*

[0077] Provenance: the lake of the same name, in Oregon (USA)

[0078] Principal ingredients and indication: amino acids and proteins, enzymes, chlorophyll, betacarotene, mineral salts for thinning regimes, preventing cutaneous aging

[0079] Appellation: *Dunaliella salina*

[0080] Provenance: North America, Australia and the Dead Sea

[0081] Principal ingredients and indications: high concentration of betacarotene as dermoprotector, anti-aging, permits keeping a healthy skin and young appearance, with a protective function in case of bronzing care.

[0082] Appellation: *Chlorelle*

[0083] Provenance: Japan

[0084] Principal ingredients and indications: proteins, chlorophyll, vitamins and minerals, promotes the elimination and regeneration of cells, useful in thinning regimes to rebalance the organism and to compensate certain possible nutritional deficiencies

[0085] The use of algae in cosmetics is thus reinforced with time. The dermatological properties flow from a series of active substances, among them: anti-oxidant vitamins, for example provitamins A and D and vitamin C; the specific

hydrating and mucilagenous biopolymers; different biologically active secondary metabolites.

[0086] The present cosmetic products used contain algae including: cleaning milk, toning, hydrating cream, deodorant, cream for the hands, for the face and for the body, intimate cleaning, shampooing; as well as specific products for the bath, products useful in combating cellulite, stretch marks, problems of acne and contribute to the improvement of the cutaneous appearance.

[0087] The anti-cellulite treatment with thalassotherapy uses sea water rich in typical oligo-elements in association with different types of marine algae. It can be made into specific cosmetic preparations and is if desired applied topically in algae based preparations such as or in the form of extracts, such as mugs, masks and other extemporaneous local applications.

[0088] The drawback of the cosmetic formulations used at present is connected to the time of application and to the contact with the skin surface, necessarily for limited times during the day.

[0089] The invention resides particularly in the fact of impregnating active substances on a support such as stockings or tights or any textile supporting direct contact with the skin.

[0090] Stockings and tights, or any textile supporting direct contact with the skin, are ideal supports to prolong time-wise the cosmetic effects of our preparations based on algae and iridaceae because they are permanently in contact with the skin and guarantee the beneficial properties of the active substances by their prolonged and progressive release. This represents an innovation in the field.

[0091] Thus, there are used substances of different types of algae and iridaceae to be absorbed and deposited on the surface and within the textile fiber of the stockings or tights or any textile support in direct contact with the skin.

[0092] Different species of algae permit a particularly interesting application. For example:

[0093] Brown algae: *Fucus, Pelvetia, Ascophyllum, Himanthalia, Laminaria, Sargassum* species.

[0094] Red algae: *Chondrus, Mastocarpus or Girgatina, Palmaria, Porphyra, Ceramium* and *Gracilaria.*

[0095] Green algae: *Ulva, Enteromorpha* and *Codium.*

[0096] There can also be cited the following varieties of algae: *Ascophyllum nodosum, Pelvetia canaliculata, Enteromorpha, Palmaria palmata, Sargassum muticum, Ceramium rubrum, Gracilaria verrucosa, Ulva lactuca, Laminaria digitata, Codium.*

[0097] All the algae have a significant anti-radical and anti-aging behavior. In particular, brown algae, among them *Fucus vesiculosus.*

[0098] According to a preferred embodiment, the alga selected is *Ulva lactuca* which contains the same quantities of vitamin A as cabbage and the vitamin C of oranges and moreover a vast spectrum of vitamins of the B group. There is a high content of mineral salts and oligo-elements: iodine, bromine; Ca, Mg and K; Mn, which can explain certain of their anti-allergic effects.

[0099] *Ulva lactuca* is moreover rich in amino acids (praline, glycine and lysine) which play an important role in maintaining cutaneous elasticity.

[0100] A complete spectrum of the composition of *Ulva Lactuca* is given in Table 1.

TABLE 1

Average composition of Ulva Lactuca

TOTAL LIPIDS	1,900
TOTAL CARBON HYDRATES/FIBERS	52,000
TOTAL PROTEINS	21,000
TOTAL MINERALS	24,000
MINERALS	
IRON	80
CALCIUM	3,000
MAGNESIUM	2,800
ZINC	5
IODINE	10
SODIUM	3,400
PHOSPHORUS	240
POTASSIUM	5,000
MANGANESE	35
COPPER	3.6
BORON	1.8
NICKEL	2
CHROMIUM	1.25
COBALT	0.15
MOLYBDENUM	0.2
TIN	0.01
SULFUR	6.500
VITAMINS	
VITAMIN A	960 IU
VITAMIN B1	0.06
VITAMIN B2	0.03
VITAMIN PP	2.6
VITAMIN B6	*
VITAMIN B9	0.01
VITAMIN B12	0.01
VITAMIN C	10
AMINO ACIDS	
PHENYLALANINE	780
ISOLEUCINE	740
LEUCINE	1,250
LYSINE	700
THREONINE	700
TRYPTOPHANE	320
VALINE	1,200
METHOIONINE	280

[0101] The algal extracts used in the framework of this invention are prepared by conventional extraction processes in liquid phase, including the use of supercritical fluids.

[0102] For extraction by aqueous means, this is carried out with a pH controlled by specific buffer solutions. The extraction is also carried out by the use of polar solvents, which are used either together or in combination with an aqueous medium.

[0103] The final production phases consist in the dehydration of the extract, concentration under vacuum, or by inverse osmosis, or else by concentration and purification by chromatography or ultrafiltration. In certain particular cases substances isolated from the algal extract are obtained by a

chemical synthesis, for example fucoli, polifucoli, difloretoli, polifloretoli, bifualoli, polifualoli and floretoli, which have a remarkable anti-radical activity. As a result, the descriptive term "algal extract" is used in general to describe substances isolated from these extracts or obtained by chemical synthesis.

[0104] The algal extracts used, to give a cosmetic action to the stockings and tights, or any textile support in direct contact with the skin, are associated with iridaceae extracts.

[0105] Among the iridaceae is particularly preferred germanic iris variety *florentine*, which is rich in polyphenols, flavonoids and anthocyans with high antioxidant action, hence with an important antioxidant activity. With the aim of developing anti-aging properties of the devices, according to the invention, the substances contained in the algal extracts are associated with one or several antioxidants.

[0106] The suitable antioxidants for our purpose include, in a non-limiting way, the antioxidants contained in grains, leaves, flowers and peels of fruit and vegetables, and can be extracted from natural basis or from equivalents by synthetic means.

[0107] Representative antioxidants are certain amino acids (example: histidine and valine), flavonoids (example: armadendrine, morine, quercitrine, esperetine, naringenine, kaempferol, apigenine, luteoline, fosetine, fustine, rutine, miricetine), anthocyanes (example: pelargonidine, cianidine, delfinidin) catechines (example: catechine, epicatechine, gallocatechine, proanthocyanosides), carotenoides and retinoides (isomers of carotene, licopene, xanthine, retinol, cataxantine), tocopherols (example: alpha-beta- and gamma-tocopherol), tannins (example: gallic acid, propyl gallate and gallic esters, tannic acid), phospholipids (example: egg lecithin, soy lecithin, L-ascorbic acid and esters, alfa-hydroxy-acids (example: lactic acid, citric acid, L-tartric acid) polychetides of Monascus red, substances from peanuts and rice (example: cardanol, cardol, anacardic acid, oryzanol, acajou oil), thiodiproprionic acid and lauric ester (DLTBP), alfa-lipoic acid, nordihydroguaiaretic acid (NDGA), guaiacol, hydroxytirosol and olive oil esters (example: oleuropene, verbacoside), other phenols from spices and herbs (example: romarin, cloves, pimento, cinnamon, ginger, paprika (TBHQ) citrus oils, trihydroxybutirophenol (THBP), BHT and BHA), maclurine, ethoxyquine, ellagic acid, musizine, boldine, but also their correspoding glucosids, esters and ethers, and their combinations.

[0108] Among the particularly preferred antioxidants, could be cited gallic acid and its derivatives, ascorbic acid and its derivatives, but also the flavonoids contained in vegetable extracts or in purified form.

[0109] Other types of active ingredients with adjuvant and/or synergetic function are moreover used in the present invention.

[0110] Although not limited to these categories, general examples include the anti-wrinkle and anti-inflammatory compounds.

[0111] Among the anti-inflammatory examples are derivatives of licorice, the flavonoids, alfa-bisabolol, romarin, azulene, asiaticoside, ruscogenine, escine, betulinic acid and its derivatives.

[0112] Anti-wrinkle examples are retinol, tocopherol, salicylates and their derivatives.

[0113] For the production of tights, or any textile support in direct contact with the skin, according to the present invention, there can be used several of these processes.

[0114] Mixing with polymeric gels or resins including the active principles (algae and synergetic agents), the deposition of micro-capsules, impregnation, precipitation or superficial absorption, for example by using suitable surface active agents.

[0115] Cationic surface active agents, non-ionic, anionic, amphoteric and their combinations are also usefully employed.

[0116] Among the surface active agents can be cited:

[0117] the non-ionics: alcoxylate of alcohol and fatty acids or sorbitan, polyoxypropylene and polyoxyethylene, the polyglycoside alkoyls, anionics: fatty acid soaps, sodium laurel sulfate or laurel ether sulfate, benzensulfonic alkoyls, the mono or dialchil phosphates and the like;

[0118] the amphoterics: dialchilamine oxides, different types of betaines, of phospholipids and natural ceramids.

[0119] Among the surface active agents, preference is given to the biomimetic phospholipids (products of Mona, USA), substances of glycerophosphocolinic nature with a cationic charge.

[0120] Moreover, the device according to the invention is treated with substances with anti-prolific action on different species of microorganisms, for example with external alcohols for example with the external alkolyls of p-hydroxybensoic acid, idantoin, paraben, imidazolidinil urea, sodium dehydroacetate, benzyl alcohol and range of quaternary ammonium compounds, in addition to inorganic substances or mixtures such as iodine and mercury compounds.

[0121] Solar filters can be incorporated in the softening bath and in the active products, for example derivatives of PABA, of benzophenone, and the cinnamati, in a quantity dependent on the degree of ultraviolet protection desired.

[0122] Example of a typology of stockings and tights and composition with extracts of *ulva lactuca*, extracts of green algae and extracts of iris *florentina*.

[0123] The accompanying drawing is given by way of example and is not limiting of the invention. It represents only one embodiment of the invention and permits easy comprehension of it.

[0124] The FIGURE is a schematic view showing the circuit which permits anchoring or impregnating the stockings or tights or any textile support in direct contact with the skin.

[0125] In this FIGURE the vessel **1** receives all the phospholipids (Phospholipid GLA (Sodium Borageamidopropyl PG-Dimonium Chloride Phosphate) and Phospholipid PCT (Cocamidopropyl PG-Dimonium Chloride Phosphate), the active principles and softeners, and it is connected by a conduit **2** to the vessel **3** which is larger, which is the fixing or impregnation bath which contains the stockings or tights, or any textile support in direct contact

with the skin, **4**. A grill **5** closes said vessel **3** in its upper portion. A conduit **6** connects the vessel **3** to the vessel **1**. The circuit is thus a closed circuit with continuous flow.

References

[**0126**] 1. Vessel

[**0127**] 2. Conduit

[**0128**] 3. Fixing or impregnation vessel

[**0129**] 4. Vessel for tights or any textile support in direct contact with the skin

[**0130**] 5. Grill

[**0131**] 6. Conduit

1. Cosmetological and anti-aging stockings or tights, or any textile support in direct contact with the skin, characterized by the fact

that they are impregnated with slow release natural substances.

2. Cosmetological and anti-aging stockings or tights, or any textile support in direct contact with the skin, according to claim 1, characterized by the fact

that the natural substances or active principles are contained in algal and iridaceae extracts, the iridaceae extracts supplying zinc and vitamin A, zinc as a coenzyme taking part in enzymatic reactions associated with cellular growth and the regulation of damaged tissues by activating the cicatrization processes, the algal and iridaceae extracts acting in synergy to have an anti-radical action.

3. Cosmetological and anti-aging stockings or tights, or any textile support in direct contact with the skin, according to claim 2, characterized by the fact

that the algal extracts are extracts of *ulva lactuca*.

4. Cosmetological and anti-aging stockings or tights, or any textile support in direct contact with the skin, according to claim 2, characterized by the fact

that among the iridaceae is particularly preferred germanic iris variety *florentine*, which is rich in polyphenols, flavonoids and anthocyans with high antioxidant action, hence with high antioxidant activity.

5. Process for production which permits impregnating stockings or tights, or any textile support in direct contact with the skin, with natural substances with slow release according to claim 1, characterized by the fact that

the process of production consists, after dyeing, with acting during the softening process by incorporating in a conventional softening bath a combination of biomimetic phospholipids, the combination of biomimetic phospholipids being as follows:

A) Phospholipid GLA (Sodium Borageamidopropyl PG-Dimonium Chloride Phosphate) at 0.5% of the bath

B) Phospholipid PTC (Cocamidopropyl PG-Dimonium Chloride Phosphate) at 1.5% of the bath

this combination of phospholipid components having the function first of promoting the fixing or impregnation of the active principles by an electrostatic process and then having the second function of being an antibacterial agent which control the bacterial flora,

to these two phospholipid compounds being added natural substances with active principles for a maximum total of 2.10%, the softening and impregnation phase lasting for about 35 minutes at a temperature comprised between 35° C. and 37° C.

6. Process for production according to claim 5, characterized by the fact that

the proportion of softening solution, including the phospholipid compounds, the active products, is a proportion of 10 to 1, which is to say for 10 kg of solution, one kilogram of tights or any textile support in direct contact with the skin, must circulate in a bath.

7. Process for production according to claim 5, characterized by the fact that

the active principles or natural substances are as follows:

a) Marine algae from 0.7% to 1.00% maximum

b) *Uva Lactuca* from 0.3% to 0.5% maximum

c) Iris *Florentina* from 0.3% to 0.5% maximum

d) Perfume up to 0.1%

for a maximum total of 2.1%.

8. Process for production according to claim 5, characterized by the fact that the active principles are the following:

e) Ginseng from 0.25% to 0.35% maximum

f) *Ginko Biloba* from 0.25% to 0.35% maximum

g) Hydrocotyl from 0.25% to 0.35% maximum

h) Green tea from 0.25% to 0.35% maximum

i) Aloes (*Aloe Vera*) from 0.50% to 0.70% maximum

for a total maximum of 2.10%.

9. Process for production according to claim 5, characterized by the fact that

solar filters are incorporated in the softening bath and in the active products in a quantity dependent on the degree of ultraviolet protection desired.

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