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(54) **The fabric with anti--allergic properties of bioactive/physical barrier and the process of making it**

(57) The invention relates to a natural cellulose fiber fabric with anti-allergic properties, with role of bioactive / physical barrier against allergens and of passive suffering created by allergic responses in the skin / respiratory tract, to the composition of a finishing agent creator bio-composites coatings and to the processes for obtaining them concerning the improvement of the person lives

having allergic problems (adults, but also an increasing number of children) using the plant extracts as Viola tri-color, Ocimum basilicum and Mentha piperita as well as some polymeric non-allergic synthetic materials with inherent properties of silanic type containing aminic group that potentiates the natural extract.

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Description

[0001] The invention refers to a fabric that has natural roofing fibers with anti-allergic properties that have the role of bioactive / physical barrier against the allergens and the role of calming the sufferance created from the allergic responses and from the procedures of their making, as well as their evaluation of these properties by specific in vivo tests on human subjects in international accredited laboratory, the main target is people with allergy or family history of this type (consumers of textile products in all categories: day and night clothes and underwear, pajamas, blouses, shirts, dresses, suits summer, mufflers, scarves / masks to cover nose and mouth, linens, duvets, mattress covers and filling, rugs, tapestries and other furnishings, air conditioning filters, toys, etc.), and staff and decorations of kindergartens, school dormitories / student, hotels, the hospital, military, etc..

[0002] The idea of finishing textiles with protective substances / healing has become in recent years especially since approx. 80% of our body surface is covered with textiles for 24 hours in 24, cloth starting to have not only a protective / aesthetic role for the human body but also the effects of bioactive double/physical barrier against bacteria / allergens, as parameters protection of value-added textiles.

[0003] Most consumers have become more careful about the products they buy, therefore, be friendly to their health and the environment, read product labels and follow operating instructions prescribed by specialists.

[0004] There are known research and practical achievements in the field of antimicrobial textiles, such as incorporating an antimicrobial product in the polymer before the forcing (concerning synthetic fiber) chemical grafting, which gives the polymer (especially for synthetic fibers) permanent antibacterial properties or for a large number of washes sometimes the textile support is being activated and modified (plasma, Corona, ultrasound, etc.), accumulating properties can be observed only in use or inclusion in dressings, respectively finishing agents that have included synthetic chemicals with antimicrobial properties.

[0005] Research on anti-allergy treatment for textile surfaces are cvasiexistent and those occurring are of recent date.

[0006] Currently, allergy is defined as a state of hypersensitivity, resulting from exposure to an allergen and is characterized by overproduction of immune components.

[0007] Antigens that induce anaphylactic reactions are called allergens manifestations. They are found in pollen of plants, house dust in insect venom, food, medicines, detergents, metals, pets. even stress can trigger an allergic response, etc..

[0008] Allergens are a set of antigens, stimulating the synthesis of IgE antibodies (immunoglobulin E). Their chemical nature is very heterogeneous. A recent German study reveals that the human body comes in contact with

about 14000 chemicals: some are food substances, others are ingested with food, being added in the industrial process of processing. A large group is formed by pollutants. In terms of chemical allergens are glycoproteins and polysaccharides of plant or animal origin or small molecules with haptens role.

[0009] Haptenele are organic or inorganic molecules, small weight, failure to be antigens but become allergenic after their coupling with tissue macromolecules. Thus, all drugs in the native state, and their derivatives partial degradation may act as haptens and become allergenic.

[0010] Currently, people with allergies (among more children), which often go through episodes of allergic skin responses have yet to lead a life of "normal" home, job, school, leisure, they sleep, etc., while the surface portions of the body are covered with rash, blisters, etc., giving pruritus, pyrexia, burning, in a word, psychological distress, are using body clothing, dresses, shirts, underwear and other bedding, towels, interior, etc., common, sold without advice / special destinations.

[0011] These items of clothing and accessories can be made from 100% cotton fiber, but most cases are different blends with synthetic fibers, which creates increased discomfort, not to help relieve allergy prone. In some cases, unhappy, even 100% cotton fabric that is non-allergic by definition, can cause discomfort to these people, due to the use of 100% cotton aprons lower with lower price, with short fibers, which emerge continuous fabric surface and tickle, skin discomfort and it creates suffering. Moreover, textiles may themselves have negative influences on human health or may be triggered by allergies due to their enrichment with auxiliary chemicals, dyes, etc... (along with the early twentieth century) and the mode of cleaning and maintenance, because, although they are the result of development of science and technology, at their synthesis have not been concerns regarding the impact on human health but rather concerns for the application of technical facilities, spectacular visual results and commercial aspects.

[0012] For these people, but also for those who are not allergic but still have a family history, for those who want to be part of comfort while performing daily activities or during sleep / rest. only while wearing apparel products that made and antiallergic treatment without using special creams or lotions cosmetics for skin, for them were created the first fabric made allergic properties, as a result of research conducted within ICECHIM-Bucharest in the last three years. It is intended that these fabrics / knits, by conduct, to relieve discomfort caused by eczema / blisters, allergic response, to increase the quality of life of people affected.

[0013] Further research is intended to optimize the solutions adopted in this direction, to coordinate product quality fabric itself (100% high quality cotton, satin texture, etc..) to those of the composition of treatment product, with those of the technological conditions of treating fabrics of unmanufactured from chemical textile finishing departments as well as the loading / refresh of the bio-

active agent after a total of 5-10 washes).

[0014] We want these people to find in stores soon, so woven / knitted garments manufactured and unmanufactured, made from 100% cotton and treated with antiallergic agent based on natural compounds finishing. These textiles are named the CALM SKIN ALERG and will also have an eco-label according to European legislation, which will be included in the conditions of maintenance of these textiles in order to protect the bioactive layer.

[0015] Research in the delivery of textile surfaces primarily allergy, doesn't represent a single direction due to the complexity of the allergic manifestations, which in the case of eczematous skin responses, they (eczema, pustules) are automatically accompanied by microbial superinfection. Therefore particularly useful is that textile surfaces should have antimicrobial properties, this action leading to soothe itching and speed wound closure, so follows the increased physical and psychological comfort of the human factor.

[0016] Targeted research on the taking of anti-allergic properties for the fabric are cvasiinexistent and most of them are focused on creating physical barrier fabrics against mites, those microscopic arachnids found in house dust or sleep in bed with us without knowing, night after night, in pillows, quilts, mattresses, etc., and which some of us depending on genetic susceptibility, sensitivity, etc.. can trigger various allergies, asthma is among the most unfortunate. These fabrics, made primarily from synthetic or mixed with cotton, are woven so that the meshes are smaller than mites could pass, and are also covered with the polymer film also to prevent the mites to pass, or the polymer film may contain some natural or synthetic biocides for their number to be reduced (for now can not be their total annihilation problem because they are highly resistant).

[0017] It is known a special fabric, based on 100% polyester fiber or mixed (especially underwear) that is less than 0.5 to 8 μm pore size, as is the size of human microflora or mites, covered with polymeric films that have a content of specific synthetic chemicals, so mites can not pass. Its disadvantage is given that this fabric is used exclusively for manufacturing bedding where mites really, is most likely to find in large numbers, it is also hard to believe that such a fabric can give comfort to achieve acceptable skin and would be such a fabric that could never be used for body clothing, towels, etc., to relieve eczema as allergic responses in some episodes is allergenic polyester fiber because by its very nature, the fabric is such made to have hydrophobic properties and getting them as well as other synthetic fibers is an ecological problem.

[0018] There is known a method of antimicrobial treatment of textiles and anti-mites on a vegetable oil extract derived from a subtropical / tropical area, but that was extracted in solvent and purchased in Germany. mainly used as insecticide for forestry, agriculture veterinary hygiene and that fights against flies, worms, larvae etc.. as against many species of bacteria. Although this oil has

a repulsive odor, a rapid oxidation to give a beige-brown, a degradation of UV active compounds at temperatures above 65 °C and a degradation of the active compounds in contact with water, he was microincapsulat with a resin urea-formaldehyde and deposited in the presence of crosslinked fabric, coated fabric which provides resistance to 5 washes. It is recommended for underwear, especially for interior design and floor coverings. There are several disadvantages arising even from the above, namely it is the high price of the final product, then it has to be microincapsulated so that it could be embedded in crosslinked and to last but also to alleviate the odor, capsules but can break during use.

[0019] It is also known a model treatment of mixtures of synthetic fabrics, so that it becomes increasingly a barrier against allergens / mite, declared permeable fabrics, comfortable, durable and yet flexible fluorochemical based compounds, the disadvantage being the limited target for which they are produced and the high percentage of chemicals used, the nature of the fibers used to cover fluorochemical compounds.

[0020] There are also several methods known in the interior spaces for reducing the allergenity that have as target also reducing the number of mites of indoor tanks, which means the whole place to sleep: pillows, mattresses, quilts and other coverings, carpets, dogs and cats. Among these methods is mentioned a method used for depositing fabric of chemical biocides, disadvantage that are themselves toxic and potentially allergenic or proteolytic enzymes such as subtilisin to destroy antigens, enzymes that also have the disadvantage of being allergenic.

[0021] There are known and some very recent research, presented in an article, which is closer to what we wanted to realize, but were still working with clinical trials. It's coverage of cotton fabric with silica type TEOS (tetraethoxysilan), modified by sol-gel process, in which are embedded natural oils extracted from plants such as Evening Primrose and Perilla or eucalyptus essential oils extracted from. mint and camphor. The disadvantage is that besides mint, other herbs are difficult to obtain, then the target is to create first a pleasant texture to skin oils are also used silane is indeed the easiest subject to process sol-gel but no additional antimicrobial properties and its connections with cellulosic substrate are weak, the molecule is short (and the authors acknowledge) the need to add an acrylic polymer to increase wash resistance while deposited bioactive layer, which is detrimental to the feel.

[0022] The technical problem that the invention is solving, is determining the type of fabric that can withstand even to be treated without anti-allergy skin suffering without them increase symptoms, establishing creative component coating finishing agent on biocomposites selected fabric, the optimal proportions of their association, and technological conditions covering textile surface so that: fabric properties have non-allergic intrinsic to ensure reproducibility of biocomposites finishing agents

and anti-allergic properties and stability while and reproducibility of the technological conditions of coverage, all fabrics to obtain anti-allergic properties whenever necessary, with the same quality parameters.

[0023] Fabric with hypoallergenic properties, according to the invention, removes the disadvantages mentioned, in that it is used 100% cotton fabric with non-allergic intrinsic properties (although the Bbc is the only 100% recommended by us for use by persons presents allergic flare-ups on some portions of the body or whole body), then use natural extracts obtained in optimal conditions of perennial plants in our country, made by experts in pharmacognosy: an alcoholic extract from *Viola tricolor* and two plant extracts volatile oil / essential *Ocimum basilicum* and *Mentha piperita* plants (the latter being also diluted with alcohol due to their high concentration, close to 100% - and their special power of action) and last but not least is used synthetic polymeric material non-allergic intrinsic antimicrobial properties that enhances the action of active compounds from natural extracts, making the connection between them and cellulose (predominantly) of 100% cotton fiber. *Viola tricolor* and *Ocimum basilicum* are used for the first time for this purpose, while *Mentha piperita* mentioned appeared in an article in 2008. mentioning that her action in the present invention is designed differently.

[0024] Thus, the interaction of bioactive compounds present in natural extracts obtained in optimal conditions of *Viola tricolor*, *Ocimum basilicum* and *Mentha piperita*, polymer and cellulose fiber material of 100% cotton, the fabric is capable of: a) to transfer to human skin / respiratory tract while using / wearing the garment and hypoallergenic properties / inflammatory / painkiller of bioactive compounds that act synergistically (bioactive barrier action) b) to stem the growth of bacteria and / or to destroy a part of them, bacteria triggers, usually places with superinfection by additional antimicrobial polymeric material manifested used (barrier action of bioactive) c) not to allow passage to skin mites / digestion residues from their (sub micron), and noof quilts, pillows, mattresses to the surface where contact with human skin would, but to allow the transfer perspiration to the outside body for clothing and an air circulation would be beneficial to wound healing (physical barrier action).

[0025] The process of achieving 100% cotton fabric with hypoallergenic properties / soothing / preventive / protective, according to the invention is to cover the fabric with a biofilm containing:

- bioactive natural extracts with anti-allergic properties / passive soothing synergistic action of chemical compounds related components;
- a polymeric material with intrinsic antimicrobial properties (may be a crosslinked polymeric material alone or in mixture) which link the bioactive compounds and cellulose fibers.

[0026] Fabric cover with biocomposites, according to

the invention is made in the last operation on the technological classic textile chemical finishing of cotton fabrics by impregnation at 20 ... 25 °C with a medium degree of squeezing (G_{sm}) of 100% and a load of 2 ... 3% on a padder coupled with a frame width of drying 100% cotton fabrics, with a new finishing agent whose composition consists of 20 ... 200 g / 1 bioactive extract it to 20 ... 70 g / 1 monomer silane as precursor polymer impregnation followed by drying / curing temperature of 60 °C for 20 minutes (low temperature is necessary to protect bioactive compounds).

[0027] Generally, the last operation on the technological classical chemical processing of cotton textile fabric material is passed through a solution / emulsion and dry starch which makes the material have commercial aspect, smooth, shiny, unwrinkled, which at first washing starch is removed. In recent years, this last operation is increasingly used to cover with new fabric finishing agents to increase the value of textile products that benefit consumers by giving some properties is that it refers to actions to protect / healing of the skin / body by removing bacteria and unpleasant odors or smells pleasant creating for encapsulation of perfume essences or safety / maintenance / cleaning material for easier use of composite nesifonabilizare, anti-fouling, fire, etc., and all while preserving human health and the environment. In the present invention we aimed at applying new allergy products by padding, just on the technological fit our classic fabric finishing without additional investment.

[0028] Thus, applying the invention, are obtained the following advantages:

- raw materials used are non-allergic (tested in vivo in humans) and the process itself presents no toxicity;
- are used for extracts plants from spontaneous flora of our country (lower price and higher health benefit as the country of origin);
- getting the two effects simultaneously: on the one hand are conferred by the action of anti-allergic fabric synergistic properties of bioactive compounds from natural extracts and antimicrobial properties that benefit both silane due textile substrate and eczematous skin itself that automatically appear superinfection with bacteria, both types of properties making up a barrier against allergens and bioactive bacteria and, on the other hand, shall be given anti-allergy properties given physical barrier polymer coating that allergens can not penetrate easily;
- expanding the product range with a range of textile products with allergenic properties can be used both by people who suffer with allergic responses eczematous skin / respiratory tract, as well as by healthy people / children with a history of allergies family or by those who want to feel comfortable and can be made textile products with very large ovaretate destinations (listed above);
- the superior capitalisation of raw materials, especially natural plant extracts;

- reduction of material costs in terms of bioactive coating application than any other method, eg composition encapsulating bioactive compounds, finishing agents and its application on the fabric, etc..;
- energy savings, given that drying and crosslinking are coupled and performed at 60 °C, while all other methods involve: first drying at 80-100 °C and then curing at 105 ... 150 °C;
- finishing process can be included as cost in the production process, on the technological class without additional investment;
- textile products made with hypoallergenic properties (fabrics, clothing, etc..) will be accompanied by an eco-label which will mark all the parameters necessary for proper maintenance of these fabrics with biofilm protection.

[0029] In the present invention are selected three natural herbal extracts to give fabrics hypoallergenic properties, given the trend of restricting the treated textiles, for example, traditional antimicrobial chemicals, because they inevitably lead to the emergence of microorganisms resistant types, and to reduce the body's natural defense capacity (see Öko-Tex Standard 100 which excludes such substances with antimicrobial finishes).

[0030] Natural extracts used are:

- alcoholic extract from *Viola tricolor* 20 ... 25%, which is known, certainly in education and practice that has long acting anti-allergic, anti-inflammatory, antipruritic, etc.., Used as a basis for obtaining extract agent anti-allergy finish of 100% cotton fabric used for clothing the body but also to other destinations: bed linen, duvets girls, mattresses and other furnishings, air conditioning filters, etc.., and to obtain masks made mouth to protect / relieve allergic airways prone as a result of exposure to pollen allergens of mites, and
- extracts / volatile / essential oils of *Ocimum basilicum* and *Mentha piperita* with a concentration of 99.5 ... 100%, used as such, or to enhance synergistic allergic activities of active compounds by the action of *Viola tricolor* calming, cooling / refreshing / relaxation, anti-inflammatory bioactive compounds contained in these plants. These highly concentrated extracts which are obtained in very small quantities of plants can be thinned with alcohol, and then solutions are used where needed.

[0031] These extracts have the following percentages of the most important concentrations of bioactive compounds:

- extract of *Viola tricolor* with the following content in the most important compounds as concentration values: flavonoid-1. 495% ... 1. 992%; polyphenols-0. 160% ... 0.687%, tannin-1. 036 ... 4.500% saponin-3. 600 ... 5.200%, mucilage-10. 264% ... 15.54% vol-

atile oils (which have antifungal properties, immunomodulatory, anti-inflammatory, antihistamine and antioxidant) - <1 % carotenoids (which also have antioxidant) - about 18. 462%.

- *Ocimum basilicum* extract the following content in the most important compounds as concentration values: estragole-86.25%, limonene-4. 55% trans-alpha-bergamoten 2.3%.
- *Mentha piperita* extract the following content in the most important compounds as concentration values: 51.35% menthol-, 5-methyl-2-(1-methyl ethyl)-cyclohexanone 24%, 5-methyl-2-(1-methyl ethyl) cyclohexona-8% acetate 5-methyl-2 (1-methyl ethyl)-cyclohexanol -5.20%, eucalyptol, 5.05%.

[0032] Dermatological tests performed in vivo in humans since the beginning fabrics impregnated prove that each of the extracts selected / used are non-allergenic to human skin (they are biocompatible with the skin) which was expected, given that these plants are known for a long time and are frequently used by people for various diseases, by ingestion in the form of teas, tinctures, fine powders, etc..

[0033] Natural extracts are incorporated:

- a polymeric material such dimethyloctadecyl silane [3 - (trimethoxysilyl) propyl] ammonium chloride, a precursor form or hydrolyzed monomers (sol-gel), to obtain a finishing agent during fixation on the surface of cotton fabric 100 %, it becomes a desired anti-allergic properties of biocomposites with but a touch soft, pleasant, which would result in obtaining fabrics for destinations such as underwear, dresses, shirts, socks, gloves, mouth masks, lingerie bed
- with or without filler metal crosslinked acrylic polymer such as ACRONAL S 50456, which is an acrylic copolymer of ethyl acrylate, methyl methacrylate and with crosslinking (give it a rub-resistance, increased acrylamide monomer metilol, but a touch less more severe which would result in obtaining fabrics for destinations such as outerwear, girls of mattresses and other furnishings, air conditioning filters, etc..).

[0034] Silane monomer, is within the class (3) of the three classes of functionalization of textile materials and was originally synthesized to treat antimicrobial textile surfaces, due to its antimicrobial. Polymers in this class form a network able to include active and textile surfaces results are well tolerated by the skin, bioactive compounds immobilized on fabric can be released while wearing body under the action of heat, moisture, friction / movement, and according type of bioactive compounds, it can be worn over the skin, or percutaneous order to perform the specific function.

[0035] Polymeric materials such as silane monomers used in the present invention belongs to the category of polymers which ensure homogeneous coverage across the entire fabric and after fixing appropriate treatment,

chemically and physically interacts with fabric (and reticulate be grafted on its surface). Alcoxysilanul used to obtain hypoallergenic fabric is a very special alcoxysilan with a group gives quaternary ammonium silane confirmed antibacterial properties, three methoxy groups which react chemically reactive with both cellulose fibers and bioactive compounds with long chain alkanes and creating a physical links with the cellulosic substrate.

[0036] Thus, the FTIR surface reticulated cellulose fibers appear less than when using materials such as acrylic polymer, but absorption at 1731 cm⁻¹, confirm the compound's ability to react covalently with both cellulosic substrate and bioactive compounds with.

[0037] Wave number 1731 cm⁻¹ corresponds to C = O vibration band of unconjugated (but can be attributed to Si-O- bond and is considered to occur after covalent reaction), which indicates that establish links between cellulose fibers and polymer or even between the polymer and bioactive extract made active. Hydrogen bonds and Van der Waals in numbers large enough hydrophobic portions created and those created through covalent reactive methoxy groups are more or less depending on the temperature of drying / curing and the presence / concentration of the catalyst.

[0038] Acetate of sodium was used as a catalyst for the esterification reaction that hydrophobic aliphatic chains are introduced in the structure of cellulose alcoxysilanul take place under appropriate conditions. Alcoxysilanul first homopolymerisation, chains binding to the reactive groups between themselves, on the other hand, binds to cellulose and on the other bioactive compounds bind to the natural extract. There are three reactive methoxy groups and binding possibilities materialize randomly presented, in some instances the third methoxy group is unable to because of the shield law.

[0039] Textile surface layer is created initially collapsed, but can form nanopores in contact with moisture or aqueous emulsion of bioactive extract.

[0040] The polymer coating can also hold active ingredients on the principle of host / guest (host / guest), but unlike molecules such as cyclodextrins collectors are based on very specific interactions, in the case of silane, the capacity retention / release of active principles can be controlled by pore size.

[0041] Another method of differentiation is the size and shape of polymer coatings / components are deposited on the fabric surface.

[0042] Are given, further examples of the invention.

[0043] **Example 1** Impregnates in semi-continuous regime on a padder equipped with device of bath displaced and capacity of 50 liters frame of dry coupled with a dry 100% cotton fabric at ambient temperature and an average degree of squeezing of 100%, with a bath that has the following composition: a finishing agent with anti-allergic properties obtained by adding over 5 kg of alcohol extract of Viola tricolor, alcoxysilan 1.5 kg plus 43. 45 liters of demineralized water and 0.050 kg of sodium acetate and stirring in a ultraturax to 6000 rpm for 15 minutes.

Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 60 °C to protect active compounds in the extract. Textile surfaces are obtained with a slightly yellowish color because it contains beneficial flavonoids from Viola tricolor, with a soft and pleasant touch. Can be used especially for clothing near the skin type of underwear given eczematous pustules present. Bioactive composite with anti-allergic properties more than 5 withstand repeated washings (FT-IR, UV-VIZ).

[0044] **Example 2** Impregnates in semi-continuous regime on a padder equipped with device of bath displaced and capacity of 50 liters frame of dry coupled with a dry 100% cotton fabric at ambient temperature and an average degree of squeezing of 100% with a bath that has the following composition: a finishing agent with anti-allergic properties obtained by adding over 5 kg of alcohol extract of Viola tricolor. 0.250 kg of essential oil extract / volatile Ocimum basilicum, alcoxysilan 1.5 kg plus 43.20 liters demineralized water and 0.050 kg of sodium acetate and stirring in a ultraturax to 6000 rpm for 15 minutes in the preparation station dressings. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 60 °C to protect active compounds in the extract. Textile surfaces are obtained with a slightly yellowish color because it contains beneficial flavonoids from Viola tricolor, with a soft and pleasant touch. Can be used especially for clothing near the skin type underwear eczematous pustules on the present and for the manufacture of masks for mouth for people allergic to pollen and for those who very easy contract the virus, bacteria. etc.. Bioactive composite properties more than 5 allergic withstand repeated washings (FTIR, UV-VIZ).

[0045] **Example 3** Impregnates in semi-continuous regime on a padder equipped with device of bath displaced and capacity of 50 liters frame of dry coupled with a dry 100% cotton fabric at ambient temperature and an average degree of squeezing of 100% with a bath that has the following composition: a finishing agent with anti-allergic properties obtained by adding over 5 kg of alcohol extract of Viola tricolor, 0.250 kg of essential oil extract / volatile Mentha piperita, alcoxysilan 1.5 kg plus 43.20 liters demineralized water and 0.050 kg of sodium acetate and stirring in a ultraturax to 6000 rpm for 15 minutes in the preparation station dressings. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 60 °C to protect active compounds in the extract. Textile surfaces are obtained with a slightly yellowish color because it contains beneficial flavonoids from Viola tricolor, with a soft and pleasant touch. Can be used especially for clothing near the skin type underwear eczematous pustules on the present and for the manufacture of masks for mouth for allergic to pollen people and for those who very easy contract the virus, bacteria, etc.. Bioactive composite properties more than 5 allergic withstand repeated washings (FTIR, UV-VIZ).

[0046] Example 4 Impregnates in semi-continuous regime on a padder equipped with device of bath displaced and capacity of 50 liters frame of dry coupled with a dry 100% cotton fabric at ambient temperature and an average degree of squeezing of 100% with a bath that has the following composition: a finishing agent with anti-allergic properties obtained by adding over 5 kg of alcohol extract of *Viola tricolor*, 0.125 kg of essential oil extract / *Ocimum basilicum* volatile, essential oil extract of 0.125 kg / volatile *Mentha piperita*, alcoxysilan 1.5 kg plus 43.20 liters demineralized water and 50 g of sodium acetate and stirring in a ultraturax to 6000 rpm for 15 minutes in the preparation station dressings. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 60 °C to protect active compounds in the extract. Textile surfaces are obtained with a slightly yellowish color because it contains beneficial flavonoids from *Viola tricolor*, with a soft and pleasant touch. Can be used especially for clothing near the skin type underwear eczematous pustules on the present and for the manufacture of masks for mouth for allergic to pollen people and for those who very easy contract the virus, bacteria, etc.. Bioactive composite properties more than 5 allergic withstand repeated washings (FTIR, UV-VIZ).

[0047] Example 5 Impregnates in semi-continuous regime on a padder equipped with device of bath displaced and capacity of 50 liters frame of dry coupled with a dry 100% cotton fabric at ambient temperature and an average degree of squeezing of 100% with a bath that has a composition obtained from alcoxysilan 1,5 kg plus 75 ml ethyl alcohol, shake for 15 minutes at 6000 rpm ultraturax, then add 43.45 liters demineralized water and 0.050 kg of sodium acetate and more agitated 15 minutes in a ultraturax at 6000 rpm. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 90 ... 150°C. After heat treatment the fabric is washed in a washing machine to remove excess reagent width and resulting products. Bring back roller to padder-drying-frame and impregnated with a bath containing 5 kg of alcohol extract of *Viola tricolor*. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 60°C to protect active compounds in the extract.

[0048] Textile surfaces are obtained with a slightly yellowish color because it contains beneficial flavonoids from *Viola tricolor*, with a slightly rough touch. Can be used mainly for outerwear as well as all other coverings, bed linens, furnishings, air conditioning filters, etc., presented earlier described.

Claims

1. Fiber with antiallergic properties, **characterized in that** it consists of 100% cotton and has the following characteristics:

Structure: Diagonal

Fabric weight = 141 g/m² - EN 20139/99

2. Fabric with antiallergic properties, **characterized in that** it consists of 100% cotton with other characteristics than those of the fabric of claim 1 for close to skin clothing: underwear, dresses, shirts, pajamas, etc..
3. Fabric with antiallergic properties, **characterized in that** it is made and other natural cellulosic yarn than 100% cotton, such as wire, hemp, etc. for outerwear, linens and other coverings, interior decorations, filters air conditioning, etc..
4. Fabric with antiallergic properties having the target clothing bound for the body, **characterized in that** the 100% cotton fabric having the characteristics described in claim 1, prepared for dyeing, that desized-gased, boiled and bleached chemical but optical unbleached is covered with an biocomposites layer by passing a padder coupled with a dry frame at 20 ... 25 °C with a medium degree of squeezing (G_{sm}) of 100% and a load degree of 2 ... 3% by padding composition consists of 1 ... 150 g/l natural bioactive extract and 20 ... 100 g/l polymeric precursor are agitated for 15 minutes at ultraturax, 1 ... 5 g/l sodium acetate and an amount of demineralized water difference equivalent to filling volume which was calculated from the bath, impregnation followed by dry / curing temperature of 60 °C for 20 minutes, bioactive layer protection.
5. Fabric with allergenic properties as the claim 4, bound for clothing the body, **characterized in that** extract natural bioactive anti-allergic properties / antiseptic / soothing / protective extract of *Viola tricolor* is a 20 ... 25% at a concentration of 80... 150 g/l, and the precursor polymer is dimethyloctadecyl [3 - (trimethoxysilyl) propyl] Ammonium chloride concentration of 20 ... 50 g/l.
6. Fabric with allergenic properties as the claim 5, the destination of the body clothing and mouth masks to allergic people of pollen and for those who very easy contract the virus, bacteria, etc., **characterized in that** extract natural bioactive anti-allergic properties / antiseptic / soothing / protective extract is a mixture of *Viola tricolor* 20 ... 25% at a concentration of 80 ... 150 g/l and extract essential oil / volatile *Ocimum basilicum* about 99.9%, the concentration of 1 ... 10 g/l.
7. Fabric with allergenic properties as the claim 5, the destination of the body and clothing allergic mouth masks to pollen and very easy for those who contract the virus, bacteria, etc., **Characterized in that** extract natural bioactive anti-allergic properties / anti-

septic / soothing / protective extract is a mixture of Viola tricolor 20 ... 25% at a concentration of 80 ... 150 g/l and extract essential oil / volatile Mentha piperita about 99.9%, the concentration of 1 ... 10 g/l.

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8. Fabric with allergenic properties as the claim 5, the destination of the body clothing and mouth masks to allergic people of pollen and for those who very easy contract the virus, bacteria, etc., **characterized in that** extract natural bioactive anti-allergic properties / antiseptic / soothing / protective extract is a mixture of Viola tricolor 20 ... 25% at a concentration of 80 ... 150 g/l extract essential oil volatile Ocimum basilicum about 99.9% and oil extract essential / volatile Mentha piperita about 99.9% at a concentration of 1 ... 10 g/l.
9. Allergenic properties of the destination fabric outerwear and other coverings, bed linens, furnishings, air conditioning filters, etc., **characterized in that** the 100% cotton fabric having the characteristics described in claim 1, prepared as for dyeing, desize-gased, boiled and bleached chemical but optical unbleached is covered with a layer biocomposites by passing a two-stage coupled with a padder-dry frame at 20 ... 25 °C with a medium degree of squeezing (G_{sm}) 100 % and a load degree of 2 ... 3%, the first crossing took place impregnation with a bath that has a composition made from 20 ... 100 g/l dimethyloctadecyl [3 - (trimethoxysilyl) propyl] Ammonium chloride which add 5% ethanol (relative to the amount of alkoxysilan users), shake 15 minutes at 6000 rpm ultraturax, then add 1 ... 5 g/l sodium acetate and demineralized water to supplement padder capacity and stir 15 minutes longer in a ultraturax to 6000 rpm. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 90 ... 150 °C. After heat treatment the fabric is washed in a washing machine to remove excess reagent width and resulting products. Bring back roller to padder-drying frame (second pass) and impregnated with a bath containing 1 ... 150 g/l of extracts of Viola tricolor, Ocimum basilicum and / or Mentha piperita, according to claims 5, 6, 7 or 8 depending on the destination that you watch for these textiles. Is fixed depending on the type of equipment available so padding speed drying / cross-linking to occur at 60°C to protect active compounds in the extract.

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EUROPEAN SEARCH REPORT

Application Number
EP 11 46 4023

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