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METHOD OF APPLYING DEODORISING, DISINFECTING, FUNGICIDAL AND BACTERICIDAL SUBSTANCES TO CARRIERS AND IN PARTICULAR FIBROUS CARRIER SUBSTANCES

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This invention relates to a method of applying deodorizing, disinfecting, fungicidal and bactericidal substances to carriers, particularly fibrous carrier webs, which are used for industrial, hygienic, and medical purposes, such as paper, crêpe paper, cellulose, cellulose wadding, and the like materials.

The impregnation of fibrous substances with various chemicals for the above purposes is known. The impregnation methods hitherto used suffer, however, from the disadvantage, as is e. g. the case with toilet paper, crêpe paper and cellulose wadding that the chemicals incorporated in the carrier pores, do not have the desired effect when used, since the time of application to e. g. the body is too short to allow the disinfecting or the like agent adequately to become active. Moreover, a certain amount of moisture is usually required to be present in order to dissolve and thus release the agents incorporated in the fibrous substances.

The disadvantages of the known working methods are obviated according to the invention by using only such disinfecting or the like chemicals which, when applied to paper or other carriers, are not absorbed, but remain adhering to the surface of the fibrous substances and separate from their carrier as a fine powder or fibrous film only when used, e. g. on rubbing, and adhere then to the place of the body to which the impregnated material has been applied in the form of a thin film or an extremely thin layer of powder. By means of the solubilizing action of the moisture of the body the active substances are retained and activated.

It has already been proposed to apply suitable powder layers to e. g. cellulose wadding and crêpe paper, but the method of dry powdering the carrier substances is accompanied by considerable and obvious disadvantages, which are founded in the production method itself, which in addition thereto is rather uneconomic. The dust present in the surrounding atmosphere during the manufacturing process may have an injurious effect on the health of the workmen, in particular if irritating and/or toxic chemicals are used. Finally, powder dust applied to the carrier by simple powdering is easily removed from its carrier by unsuitable storage or shipping, with the result that the products may be inactivated even before use.

With a view to overcoming the drawback of known methods, the invention consists in a method of applying chemically active e. g. deodorizing, disinfecting, fungicidal and bactericidal substances to fibrous carrier webs, such as for example paper, crêpe paper, cellulose, cellulose wadding and the like materials, which substances are adapted to separate from the carrier web by light rubbing, wherein one or more of the chemically active substances is or are suspended or emulsified in agents having an affinity to fibrous substances, and the suspension or emulsion is then applied to the carrier web in any manner known per se. The suspension or emulsion may be applied cold or warm and by any methods known per se, e. g. spraying, immersion, or mixing. If desired, fibrous

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substances similar to those used as carriers e. g. specially prepared fibrous substances, and/or intermediate carrier substances of a different kind e. g. kieselguhr or the like, may be admixed with the chemicals prior to the application to the carrier. These substances should have a suitable degree of fineness.

According to this invention it is immaterial whether one or a plurality of chemicals having different e. g. disinfecting and deodorizing properties are applied to the carrier substance surface at the same time.

It is preferred to use such chemicals as are rubbed off easily on use and adhere then to the surface treated and are retained and thereby activated by the moisture present.

As agent having an affinity to the fibrous carrier webs preferably alkyl-aryl-polyglycol ether is used. Its concentration in the emulsion or suspension should be between 1 to 5% by weight.

Preferably surface e. g. finishing glues and/or wetting agents which increase the distribution on the web should be admixed with the chemically active substance.

In a preferred embodiment of the invention the active substance is first homogenized by stirring in the presence of wetting agents, surface glues and, if desired, a carrier substance. The homogenized mixture is introduced into a vessel and then in a per se known manner applied onto the moving, wet, and therefore swollen carrier web by means of rotating rollers. The applied layer should be well distributed on the web and it is subsequently pressed into the open pores of the swollen web by means of a press roller. During subsequent drying the dough-like chemically active layer forms a film and blocks the pores. The layer may be applied to one or both sides of the carrier web. In this manner the following effects are obtained:

(1) A uniform, chemically active film is formed on the carrier web which is easily rubbed off.

(2) The pores of the web are filled with the chemical and thereby blocked and closed.

(3) Migrating bacteria which may be present on the fibres of the web will be killed by contact with the active chemical.

Carrier webs treated in this manner are thus provided with an effective, surface-active film which is easily rubbed off.

In case a wetting agent with a surface tension which has a distributing effect is added to the active chemical, the effect of the product is substantially increased.

The choice of surface glues is very important, since the closure of the pores and the rubbing off is dependent thereof.

In toilet paper, moreover, the softness and absorption ability of the paper is determined by the glue. All kinds of glues which do not penetrate the carrier web are suitable e. g. surface glues such as finishing glues.

As wetting agents products of the lipophilic or hydrophilic molecule colloids are suitable.

In case the impregnated carrier is to be used for disinfecting purpose, it has been found that as active chemical hexachlorophenols and in particular hexachloro-diphenyl-methane-2,2' dihydroxy-3,5,6,3',5',6' hexachloro-diphenyl-methane are advantageously used.

The method according to the invention enables disinfecting and other substances of the kind referred to which hitherto could not, or only inadequately be made to adhere to the carrier, to be applied firmly and uniformly to the carrier substance. At the same time the active agents are easily removed from the carrier e. g. by light rubbing, resulting in their activation on the surface to be treated.

By using dispersion or suspension agents with an affinity to fibrous substances, an increased adhesion of the active

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agents to the carrier is obtained. Moreover, the stability of the final products and their storage capability is increased as contrasted to fibrous substances to which the active agents have been applied by simple powdering. A further important advantage is the complete absence of dust during the manufacture, so that injury to the health of the working staff is prevented. Moreover, no moisture is needed to release the active substances from the carrier substances.

What is claimed is:

1. A method of applying substances chemically active against microorganisms comprising at least one substance selected from the group of deodorizing, disinfecting, fungicidal and bactericidal substances to the surfaces of a carrier web of paper-type fibrous material in such a manner that said substances remain separable from the web surface by light rubbing, comprising the steps of preparing a mixture of at least one of said chemically active substances in an agent having affinity to the fibrous material from which said carrier web is made, adding thereto a finishing glue adhering to the surface, but non-penetrating into the interior of said web, and a wetting agent, homogenizing said mixture to form an emulsion therefrom, swelling said carrier web by moistening the same, moving said web and applying thereon continuously said emulsion so as to distribute the same evenly thereon as a doughlike chemically active layer, applying pressure to said layer on said swelled web, thereby causing the layer to close the pores in said web, and subsequently drying said web and layer to form a surface film containing said chemically active substances on said web, which film can easily be rubbed off.

2. A method according to claim 1, wherein a finely divided fibrous substance of the same material as said carrier web is admixed with the chemically active substance prior to the application to the carrier web, so as to enhance the separability of said chemical active substance from said web.

3. A method as claimed in claim 1, wherein intermediate carriers which are inert with regard to the chemically active substance are admixed therewith prior to the application to the carrier web.

4. A method as claimed in claim 1, wherein said intermediate carrier is kieselguhr.

5. A method as claimed in claim 1, wherein said agent having an affinity to fibrous substances is an alkylaryl polyglycol ether.

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6. A method as claimed in claim 5, wherein the amount of alkylaryl polyglycol ether in the suspension or emulsion is 1 to 5% by weight.

7. A method as claimed in claim 1, wherein the chemically active substance is a hexachloro phenol.

8. A method as claimed in claim 7, wherein the hexachlorophenol is hexachloro-dioxo-diphenyl methane-2,2'-dihydroxy-3,5,6,3',5',6' hexachloro-diphenyl methane.

9. A method as claimed in claim 1, wherein the wetting agent is a product of lipophilic or hydrophilic molecule colloids capable of spreading said emulsion over the surface of said web without furthering a substantial impregnation of the latter.

10. A method of applying substances chemically active against microorganisms comprising at least one substance selected from the group of deodorizing, disinfecting, fungicidal and bactericidal substances to the surfaces of a carrier web of paper-type fibrous material in such a manner that said substances remain separable from the web surface by light rubbing, comprising the steps of preparing a mixture of at least one of said chemically active substances in an agent having affinity to the fibrous material from which said carrier web is made, adding thereto a finishing glue adhering to the surface, but non-penetrating into the interior of said web, and a wetting agent homogenizing said mixture to form an emulsion therefrom, swelling said carrier web by moistening the same, moving said web and spraying thereon continuously said emulsion so as to distribute the same evenly thereon as a doughlike chemically active layer, applying pressure to said layer on said swelled web, thereby causing the layer to close the pores in said web, and subsequently drying said web and layer to form a surface film containing said chemically active substances on said web, which film can easily be rubbed off.

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