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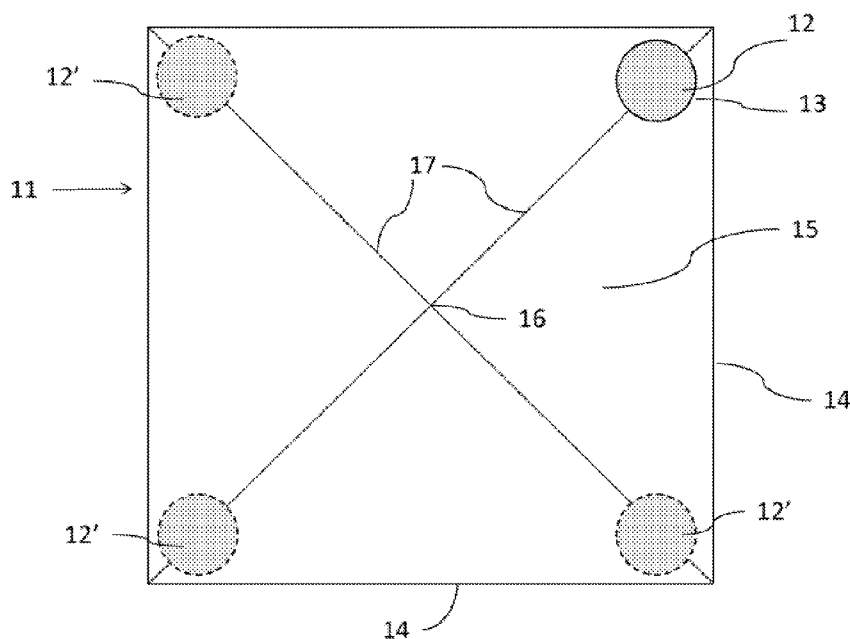
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(54) Title: WIPE PRODUCT

Fig. 1



(57) Abstract: A wipe comprising a sheet of flexible material, said sheet having at least three side edges, so that corner zones are formed in the sheet where two adjacent side edges meet, the wipe further comprising at least one treatment region which comprises a chemical substance and a wiping region which is essentially free from said chemical substance, and wherein said at least one treatment region is located at a corner zone of the wipe, adjacent to the side edges of the wipe.

Wipe Product

TECHNICAL FIELD

The present invention relates to a wipe product with partial addition of a chemical treatment
5 composition, and partially free of said chemical treatment composition.

BACKGROUND ART

There are currently numerous pre-impregnated dry wipes, on which cleansing and/or care
products have been applied beforehand. WO 2005/067868 discloses a wipe with chemicals
10 applied to discrete areas. The areas free of chemicals are to serve as a gripping or grasping
part after folding the wipe.

There is a need for improvement of impregnated products, which are user friendly, dry to the
touch, easy to use wipe products, comprising a chemical substance.

15 SUMMARY OF THE INVENTION

The present invention relates to a wipe comprising a sheet of flexible material, said sheet
having at least three side edges, so that corner zones are formed in the sheet where two
adjacent side edges meet, the wipe further comprising at least one treatment region which
comprises a chemical substance and a wiping region which is free from said chemical
20 substance, and wherein said at least one treatment region is located at a corner zone of the
wipe, adjacent to the side edges of the wipe. This enables the user to use the wiping region to
wipe off the chemical substance after use, using said wiping region. This also enables the user
to determine the amount of product to be used, as the product can be used directly in contact
with the area to be treated, or distributed throughout the surface of the sheet before use.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic top view of a wipe of one embodiment of the invention.

Figure 2 is a schematic top view of a wipe of a second embodiment of the invention.

Figure 3 is a schematic top view of a wipe of a third embodiment of the invention.

Figure 4 is a schematic top view of a wipe of a fourth embodiment of the invention.

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DETAILED DESCRIPTION

The present invention relates to a wipe comprising a sheet of flexible material, said sheet having at least three side edges, so that corner zones are formed in the sheet where two adjacent side edges meet, the wipe further comprising at least one treatment region which comprises a chemical substance and a wiping region which is free from said chemical substance, and wherein said at least one treatment region is located at a corner zone of the wipe, adjacent to the side edges of the wipe. This enables the user to use the wiping region to wipe off the chemical substance after use, using said wiping region. This also enables the user to determine the amount of product to be used, as the product can be used directly in contact with the area to be treated, or distributed throughout the surface of the sheet before use.

The sheet may have a central region forming the wiping region essentially free from said applied chemical substance. The wipe may further comprise an area for each treatment region which is 1-15 % of the total area of the wipe, preferably 2-10% of the total area of the wipe, and more preferably 2-6 % of the total area of the wipe. The area of the central region is suitably at least 25 % of the total area of the wipe, preferably at least 50 %, more preferably at least 75 % of the total area of the wipe. The at least one treatment region is preferably in the form of distinct deposits. Furthermore, the invention relates to a wipe according to the above, wherein the at least one treatment region may have a different colour or surface structure than the wiping region.

The wipe may comprise two or more treatment regions, located at different corner zones of the wipe, adjacent to the side edges of the wipe. Furthermore, the at least two treatment regions may comprise the same chemical substance in different concentrations, or they may comprise different chemical substances. Preferably, the treatment regions comprising

different chemical substances, or different concentrations of the same chemical substance, have different visual appearances. The treatment region comprising the chemical substance is suitably substantially dry. The chemical substance may be activated by water, heat, friction or mechanical rubbing.

- 5 The sheet of flexible material may be comprised of one or more layers of tissue or nonwoven material or combinations thereof. The basis weight of the sheet of flexible material is preferably 30-125 gsm.

The chemical substance may comprise cleaning agents, such as detergents, or grease dissolving components, or surfactants, or combinations thereof. Alternatively, the chemical
10 substance may comprise skin care agents, such as cleansing solutions or lotions or combinations thereof. Furthermore, the chemical substance may alternatively comprise oils, or polymers, or waxes or combinations thereof.

The invention relates to a wipe comprising a sheet of flexible material. The sheet has at least three side edges, so that corner zones are formed in the sheet where two adjacent side edges
15 meet. The sheet forming the wipe is preferably rectangular, since this is a shape which is easy to cut and to handle. However, the sheet may have any other shape as long as adjacent side edges form some kind of corner regions, for example triangular. The wipe comprises at least one treatment region which comprises a chemical substance, and a wiping region which is essentially free from said chemical substance. The treatment region is located at a corner zone
20 of the wipe, adjacent to the side edges of the wipe. By adjacent to the side edges is meant in this context that an edge of the treatment region coincides with the side edge of the wipe, or that it is located at a distance of 0-10 mm, preferably 2-6 mm, from the side edge of the wipe.

The wipe may also comprise two or more treatment regions, as explained in more detail below.

- 25 By the wiping region being essentially free from chemical substance is meant that only very small amounts of chemical substance in the form of impurities may be present in the wiping region, said amounts being less than 0,5 % in weight based on the weight of the flexible material. The region may be used to wipe off the chemical substance after use thereof on a surface.

The wipe may be in the form of a cut ready to use sheet, which may be single packed in an envelope, or a plurality of wipes may be arranged in a pile in a package. Alternatively, a plurality of wipes may be provided in the form of a roll, with perforations separating individual wipes to be teared off the roll. The side edges mentioned above, dictating the placement of the treatment region, would then consist of the edges of the individual wipe, once it is teared off from the roll at the perforation.

The chemical substance may be a water soluble compound or composition, which can be activated by means of water. Alternatively, the chemical substance may be a compound or composition which is non-soluble in water, and which can be activated for example by mechanical influence, such as rubbing or pressing against a surface. Heat may also be used to activate the chemical substance. It may relate to heating with an external heat source, or warm water, or heat from the body, for instance the hands. Alternatively, the heat may be accomplished by rubbing the wipe, possibly between the hands, or against another surface. The chemical substance may if desired also be a substance, which is soluble in other solvents than water, such as for example alcohols or hydrocarbons. The wipe may have a central region, forming the wiping region essentially free from said applied chemical substance, thereby facilitating wiping of the treated surface since the at least one treatment region located at a corner of the wipe is well distanced from a central point of the wiping region.

The area of each treatment region may be 2-15 %, is more preferably 1-10 % of the total area of the wipe, and even more preferably 2-6% of the total area of the wipe. Consequently, the total area of the treatment region(s) will be the sum of all treatment region areas present on the wipe. In addition to treating a surface with chemical substance, the relatively small area of the treatment region enables the user to easily wipe the surface with sheet material being free from chemical substance, after or before treatment with the chemical substance as desired, thus being able to avoid using the chemical substance in the treatment region when this is appropriate, and/or controlling the amount of substance to be used. Thus, a dual function of the wipe is provided, as it can be used as a clean wipe, or making use of the treatment region on said wipe.

The area of the wiping region may be more than 25% of the total area of the wipe, preferably more than 40%, preferably more than 50%, preferably more than 60%, preferably more than

75% of the total area of the wipe. The central wiping region extends from a central point on the wipe towards the edges of the wipe, and ends at the edge of the treatment region. It may thus extend all the way to the edge of the wipe in the middle of the side edge length of the wipe. This central region essentially comprises the wiping region of the wipe. By having a large
5 central portion of the wipe essentially free from the chemical substance, it allows the user to easily make use of the wipe as a clean, unimpregnated wipe, without the need of folding away impregnated wipe parts..

The treatment region may have any suitable shape, for example circular, rectangular, triangular or a circular sector. The one or more treatment regions comprised in the wipe are
10 preferably in the form of distinct deposits. By distinct deposit is meant that each chemical substance spot is clearly visible on the sheet, even though it may overlap with other spots of another chemical substance. Also, the edges of the deposits are very distinct and non-fuzzy. This will ensure that there is a significant difference in concentration of chemical substance between the deposit of chemical substance and the wiping region. This enables the user to
15 clearly distinguish the treatment regions from the wiping region.

The treatment region may be also highlighted on the wipe by means of colour or varying surface structure, in order to further improve identification of the location of the treatment area. Thus, the treatment region may have a different colour or surface structure than the wiping region. This will facilitate identification of the treatment regions on the wipe, and thus
20 ensure effective use of the wipe. The chemical substance in the treatment region may be coloured to differentiate the treatment region from the central wiping region. It is possible to use water soluble, homogenous (single phase) chemical substances in combination with at least one water-soluble or water-dispersible dye. It is also possible to use a non-water soluble dye for chemical substances that are not water-soluble. The most preferred mixing ratios
25 dye/chemical substance range from about 1/100 to 10/100 based on the weight. Any dye can be included in the chemical substance as long as it results in clearly visible distinct spots after the application on the sheet and shows a strong affinity to the flexible material comprising the sheet. Suitable dyes can be selected from basic, acid, or direct dyes. Among these, azo dyes are particularly preferred. The dye may be water soluble, for example an azo direct dye, such
30 as direct violet (C.I.: 27905 Dir. Violet. 51), marketed by Ciba-Geigy under the trade name "Pergasol Violet RA flüssig". Other direct dyes, such as direct blue 5BN LIQ (C.I.: 24400 Direct

Blue 15), direct brown GSV LIQ (C.I.: 35005 Dir. Brown 44), chrysophenine G (C.I.: 24895 Dir. Yellow 12), direct yellow MV LIQ (C.I.: 40000 Dir. Yellow 11), direct black L LIQ or direct red MV (C.I.: 28160, Dir. Red 81) may also be used. Generally, it is preferred to use more intense colours, such as blue, red, green, brown, black or violet in order to achieve the sufficient contrast to the colour of the wipe, which in general is white or off-white.

The colour may also be applied by means of printing onto the already applied chemical substance. The colour may also be applied by means of printing onto the wipe before applying the chemical substance.

The chemical substance in the treatment region may have a different surface structure compared to the central wiping region, in order to facilitate identification of the position of the treatment region, which may be particularly useful for visually impaired users. For example, the area of the treatment region may be embossed onto the sheet, causing a change in relief structure at that particular location of the wipe, which may be visible and/or may be felt by touching the wipe. Various embossing patterns can be used. It may also be advantageous to combine colour and surface structure marking of the treatment region. The chemical substance may be applied during embossing by means of printing embossing, in order to speed up manufacture of the wipe.

The wipe may include one single treatment region, the remaining area of the wipe being the wiping region, essentially free from chemical substance. This allows treatment of the surface, combined with convenient wiping since the wiping region will be comprised of most of the wipe.

The wipe may alternatively comprise two or more treatment regions, located at different corner zones of the wipe, adjacent to the side edges of the wipe. The at least two treatment regions may then contain the same chemical substance and concentration in order to allow repeated treatment of the same type, or may alternatively comprise the same chemical substance in different concentrations, which allows the user to choose between different concentrations of chemical substance, or the treatment regions. The difference in concentration may be accomplished by different coverage in the treatment region of the chemical substance. The treatment region may be covered by the chemical substance by for instance 100%, or by for instance 75%, 50 25%, 15%, or 5%, in order to obtain the desired

concentration, where the weight of chemical substance per surface area covered is the same throughout. A 100 % coverage of the treatment region, means that the area of the treatment region is fully covered by chemical substance, whereas a coverage lower than 100% means that the area of the treatment region is covered by chemical substance in a pattern leaving
5 some parts of the treatment region area uncovered. A pattern only partially covering the area of the treatment region may be comprised of spots, stripes or any other suitable pattern, and may have a density chosen to obtain a desired amount of chemical substance in the treatment region.

The difference in concentration may alternatively be accomplished by using the same amount
10 of coverage in all treatment regions, but with different concentrations of the same substance in each treatment region, i.e. the chemical substance may be more diluted in one treatment region than in another.

Furthermore, when the wipe comprises two or more treatment regions, the at least two treatment regions may comprise different chemical substances. This may be useful for
15 example when the different chemical substances are to be used sequentially. This is also advantageous when a combination of different chemical substances is desired, for example where the substances should not be blended before use of the wipe. In such a case, the wetting of the wipe with water may be the action causing the different chemical substances to be mixed in the wipe, whereby the wipe is ready to be used.

The two or more treatment regions in the wipe comprising different chemical substances, or
20 different concentrations of the same chemical substance, may have different visual appearances, in order to facilitate identification of each different treatment region. This difference may comprise in different colours for different treatment regions, or different surface structures for different treatment regions, or any combination thereof. For instance,
25 different patterns of embossing may be used for different treatment regions, optionally in combination with the same or different colours for each treatment region.

Suitable methods for application of the chemical substance to the wipe include, but are not limited to, flexographic printing, rotogravure printing, offset printing, letterpress, direct
30 gravure coating, offset gravure coating, reverse roll coating, flexographic coating, slot coating, dip coating, rod coating, knife coating, air knife coating, blade coating, slide coating, curtain

coating, spraying, hot melt spraying, foam application, and extrusion. Further information on coating methods is disclosed in Modern Coating and Drying, Edward Cohen and Edgar Gutoff, 1992 VCH Publishers, Inc.

The wipe is suitably substantially dry. By substantially dry is meant that the wipe feels dry and non-sticky to the touch. To achieve the dry feel the water content of the flexible material of the wipe should preferably not exceed 25% in weight based on the weight of the flexible material, exclusive of the chemical substance of the treatment region. Preferably, the water content is less than 15 %, more preferred water contents are 12 % in weight or less, more preferably 10 % in weight or less, in particular 9 % in weight or less, or 8 % in weight or less.

The water content is measured according to the industrial standard DIN 54540-9.

The treatment region comprising the chemical substance is suitably also substantially dry and non-sticky, and need therefore not be protected by a release sheet or the like. In order to achieve this, the chemical substance should be a composition that is able to dry after application onto the flexible material, or a composition free from water, which is naturally non-sticky.

The wipe comprises sheet of flexible material comprising of one or more layers of tissue or nonwoven material or combinations thereof. Tissue paper and nonwoven material are per se well known within the technical field of wipes.

Tissue paper suitable for use in the wipe suitably comprises cellulosic fibres. The pulps employed can be a primary fibrous material or a secondary fibrous material, such as recycled pulps, and can stem from lignin-free or low lignin sources, such as cotton linters, esparto (alfa) grass, bagasse, hemp fibres or flax. Preferably the pulp is produced from ligno-cellulosic material such as softwood or hardwood. The fibres may also be of regenerated type, e.g. Lyocell. The tissue paper product may suitably include two or more tissue paper plies, more preferably 2 to 6 plies, for instance 3 or 4 plies. Each ply may be formed by one, two or more layers, which are integrally connected to each other. These layers can for instance differ in their fibre composition, e.g. using combinations of long fibres, short fibres, fibres of different origin, etc., or in the chemical treatment to which the corresponding fibres were subjected prior to forming the ply. A layered ply can be generated by supplying different slurries of papermaking fibres to multi-layered headboxes.

Nonwoven materials suitable for use in the wipe are textile-like composite materials, which are preferably comprised of synthetic fibres, optionally in combination with pulp fibres. The synthetic fibres may be for example polyester fibres, polypropylene fibres or polyethylene terephthalate fibres, rayon, or combinations thereof. Nonwoven sheets useful for the wipe
5 may be single ply or multi-ply sheets.

In the wipe, the sheet of flexible material preferably has a basis weight of 30-125gsm, before addition of chemical substance.

For multiply products it is preferred that two or more plies, in particular all plies are joined with each other through mechanical ply bonding means, e.g. embossing, and/or chemical ply
10 bonding means. The structured surface resulting from embossing steps may have a positive impact on the cleaning efficiency, since the surface can be subjected to simultaneous chemical and mechanical treatment.

The flexible material may be of a type which can be easily disintegrated in water, which will pile and degrade upon use with water. This allows easy disposal, as it for instance may be
15 flushed down the toilet after use. On the other hand, it may not be desired for the material to be easily disintegrated in water. In such a case, the wet strength is preferably enhanced by including wet strength agents in one or more plies, in particular all plies of the tissue paper. For tissue paper, the wet strength agent is preferably added to the cellulosic fibres prior to forming the paper in such an amount, in terms of active substance, that 0.01 to 5 wt.-%, more
20 preferably 0.01 to 3 wt.-%, in particular 0.5 to 2 wt.-%, based on the total amount of untreated cellulosic fibres are retained. The amount of untreated cellulosic fibres refers to the dry weight thereof, as measured according to EN 20638:1993. The wet strength agent is preferably a cationic polymer containing cationic groups, such as positively charged quaternary nitrogen atoms.

25 One intended use of the wipe is cleaning of surfaces and/or objects in general, and the chemical substance comprised in the treatment region of the wipe may then comprise cleaning agents, such as detergents, grease dissolving components, surfactants, or any combination thereof. The wipe may thus for example comprise a product for cleaning spectacles, glazing, tiled or parquet floors, a cleaning product for kitchen countertops,
30 bathrooms, toilets, shower areas, or for cleaning of any hard surface. Materials the wipe may

be used on for cleaning may thus include, but is not limited to, porcelain, glass, metal, ceramics, stone, plastic materials, wood materials, composite materials, and the cleaning product comprised in the wipe is consequently a product suitable for use on the material in question. If desired, natural or synthetic abrasive particles, such as calcium carbonate, sand, or ceramic particles, can be included in the chemical substance.

The treatment region may further comprise a lathering agent, in a form capable of forming lather, or foam, upon contact with water. The lather is typically formed during the wiping movement which involves the mechanical agitation of lathering surfactant and water in the presence of air. The treatment with a lathering surfactant may lead to an increase in thickness of the final product, e.g. of 10 to 30%, preferably 15 to 25%, and most preferably about 20% in relation to the total thickness of the one or more tissue layers prior to the treatment.

Another intended use of the wipe is for skin care. For such use, the chemical substance of the treatment region comprises skin care agents, such as cleansing solutions, lotions, or any combinations thereof. Cleansing solutions and lotions may for instance include one or more substances from the group comprising lotions, deodorants, detergents, emollients, external analgesics, binders, film formers, skin moisturizing ingredients as known in the art, opacifiers, skin conditioning agents, skin exfoliating agents, skin protectants, sunscreens, vapor rubs and the like; other additives include, without limitation, anti-acne additives, antimicrobial additives, antifungal additives, antiseptic additives, antioxidants, or aesthetic additives such as fragrances or dyes, or any combination thereof. The substances included in the treatment region should preferably be skin friendly when the wipe is intended to be used in contact with the skin of the user.

While dry to the touch, when intended for skin care, the product needs to have a pleasant feel against the skin. This may be accomplished by adding softening agents that promote the softness, such as bulk softness or surface softness, of the product, particularly the tissue paper or nonwoven material. For example a polyhydroxy compound (e.g. ethylene glycol, propylene glycol, a liquid polyethylene glycol (derivative), a liquid polypropylene glycol (derivative) and/or glycerol), also quaternary ammonium compounds as described e.g. in US 5,312,522 or US 5,397,435 and the prior art cited therein, optionally in combination with the polyhydroxy compounds described in both these documents; or a poly(siloxane), particularly the

(poly)siloxanes described in EP-A-347 153 and EP-A- 347 154, may be used. Surfactants used e.g. as absorption rate control agents, e.g. long-chain quaternary ammonium compounds that may also exhibit softness-promoting action, waxes, oils, and/or inorganic or organic pigments or dyes may be applied as well.

- 5 Furthermore, the chemical substance in the wipe may comprise oils, polymers and/or waxes, or any combinations thereof, which allow additional intended uses. Hence the wipe may comprise a polishing products for furniture, such as for instance wood furniture or possibly furniture comprising stone; a wax-based product for the upkeep and cleaning of wood; or else a waxing type product for cleaning and caring for leather, for instance, leather furniture, or
10 possibly leather clothes, leather shoes or even leather accessories such as handbags or other bags or luggage comprising leather.

DETAILED DESCRIPTION OF THE DRAWINGS

- Fig. 1 shows one embodiment of a wipe 11 according to the above description. The wipe 11
15 comprises at least one treatment region 12 of circular shape comprising chemical substance, located in a corner zone 13 formed by two adjacent side edges 14. The wipe 11 may optionally comprise additional treatment regions 12', in one or more of the remaining corner zones 13. A central point 16 of the wipe is defined by two imaginary dotted lines 17. The central region 15, extending from the central point 16 towards the side edges 14, is substantially free from
20 chemical substance and hence is also the wiping region.

- Fig. 2 shows a second embodiment of a wipe 21 according to the description. The wipe 21 in this embodiment comprises at least one square treatment region 22 comprising chemical substance, located in a corner zone 23 formed by two adjacent side edges 24. The edge of the
25 treatment region 22 coincides with the edge of the wipe 24. The wipe 21 may optionally comprise additional treatment regions 22' in one or more of the remaining corner zones 13. The central region 25 extends from the central point 26 of the wipe 21 towards the side edges 24, and is substantially free from chemical substance, and hence is also the wiping region.

Fig. 2 also illustrates an alternative placement of the treatment region, wherein said treatment region 22'' does not extend all the way to the side edges 24 of the wipe 21, leaving a small distance between the treatment region and the side edge of the wipe.

Fig. 3 shows a third embodiment of a wipe 31 according to the description. In this embodiment, the wipe 31 comprises four treatment regions 32 having the shape of a circle sector located in each corner zone 33 formed by two adjacent side edges 34. The central region 35 extends from the central point 36 of the wipe 31 and towards the side edges 24.

Fig. 4 shows a fourth embodiment of a wipe 41 according to the description. The wipe 41 in this embodiment comprises at least one triangular treatment region 42 comprising chemical substance, located in a corner zone 43 formed by two adjacent side edges 44. The edge of the treatment region 42 coincides with the edge of the wipe 44. The wipe 41 may comprise additional treatment regions 42' in any one or more of the remaining corner zones 43. The central region 45 extends from the central point 46 of the wipe 41 towards the side edges 44, and is substantially free from chemical substance, and hence is also the wiping region.

Fig. 4 also illustrates an alternative placement of the treatment region, wherein said treatment region 42'' does not extend all the way to the side edges 44 of the wipe 41.

CLAIMS

1. A wipe (11, 21, 31, 41) comprising a sheet of flexible material, said sheet having at least three side edges (14, 24, 34, 44) so that corner zones (13, 23, 33, 43) are formed in the sheet where two adjacent side edges meet, the wipe further comprising at least one treatment region (12, 22, 32, 42) which comprises a chemical substance and a wiping region (15, 25, 35, 45) which is essentially free from said chemical substance, and wherein said at least one treatment region is located at a corner zone of the wipe, adjacent to the side edges of the wipe.
5
2. The wipe according to claim 1, wherein the sheet has a central region forming the wiping region essentially free from said applied chemical substance
10
3. The wipe according to claim 1-2, wherein the area of the treatment region is 1-10 % of the total area of the wipe, preferably 2-6% of the total area of the wipe.
4. The wipe according to claim 1-3, wherein the area of the central region is more than 25 % of the total area of the wipe, preferably more than 50 %, preferably more than 75 %
15 of the total area of the wipe.
5. The wipe according to claim 1-4, wherein the treatment region is in the form of a distinct deposit.
6. The wipe according to any of the claims 1-5, wherein the at least one treatment region has a different colour or surface structure than the wiping region.
- 20 7. The wipe according to any of the claims 1-6, comprising two or more treatment regions, located at different corner zones of the wipe, adjacent to the side edges of the wipe.
8. The wipe according to claim 7, wherein at least two treatment regions comprise the same chemical substance in different concentrations.
9. The wipe according to claim 7 or 8, wherein at least two treatment regions
25 comprise different chemical substances.

10. The wipe according to any of claims 7-9, wherein treatment regions comprising different chemical substances, or different concentrations of the same chemical substance, have different visual appearances.

11. The wipe according to any of the claims 1-10, wherein the treatment region
5 comprising the chemical substance is substantially dry.

12. The wipe according to any of the claims 1-11, wherein the chemical substance is activated by water, heat, friction or mechanical rubbing.

13. The wipe according to any of the claims 1-12, wherein the sheet of flexible material is comprised of one or more layers of tissue or nonwoven material or combinations
10 thereof.

14. The wipe according to any of the claims 1-13, wherein the basis weight of the sheet of flexible material is 30-125 gsm.

15. The wipe according to any of the claims 1-14, wherein the chemical substance comprises cleaning agents, such as detergents, grease dissolving components, surfactants, or
15 any combinations thereof.

16. The wipe according to any of the claims 1-15, wherein the chemical substance comprises skin care agents, such as cleansing solutions, lotions, or any combinations thereof.

17. The wipe according to any of the claims 1-16, wherein the chemical substance comprises oils, polymers, waxes, or any combinations thereof.

Fig. 1

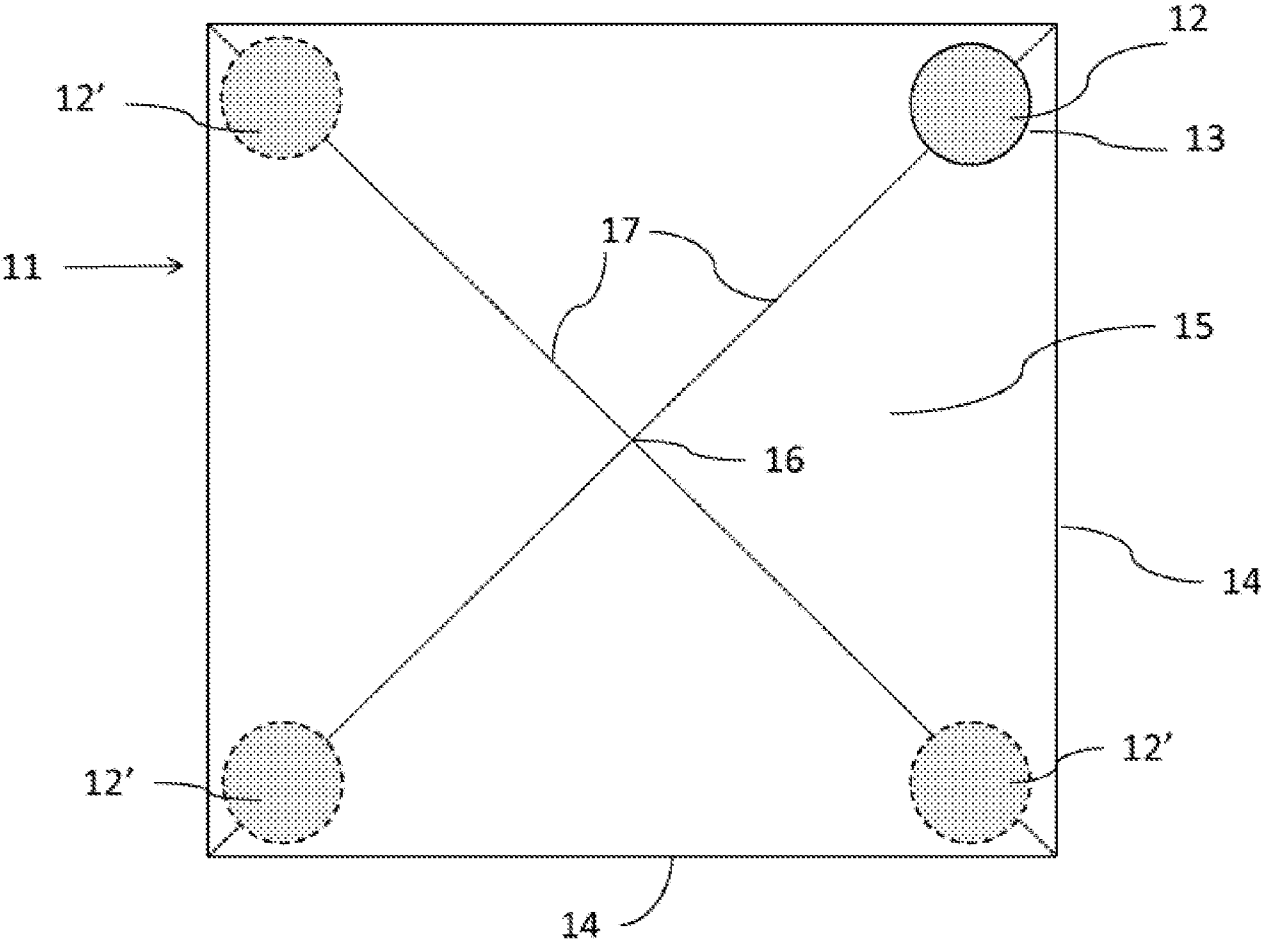


Fig. 2

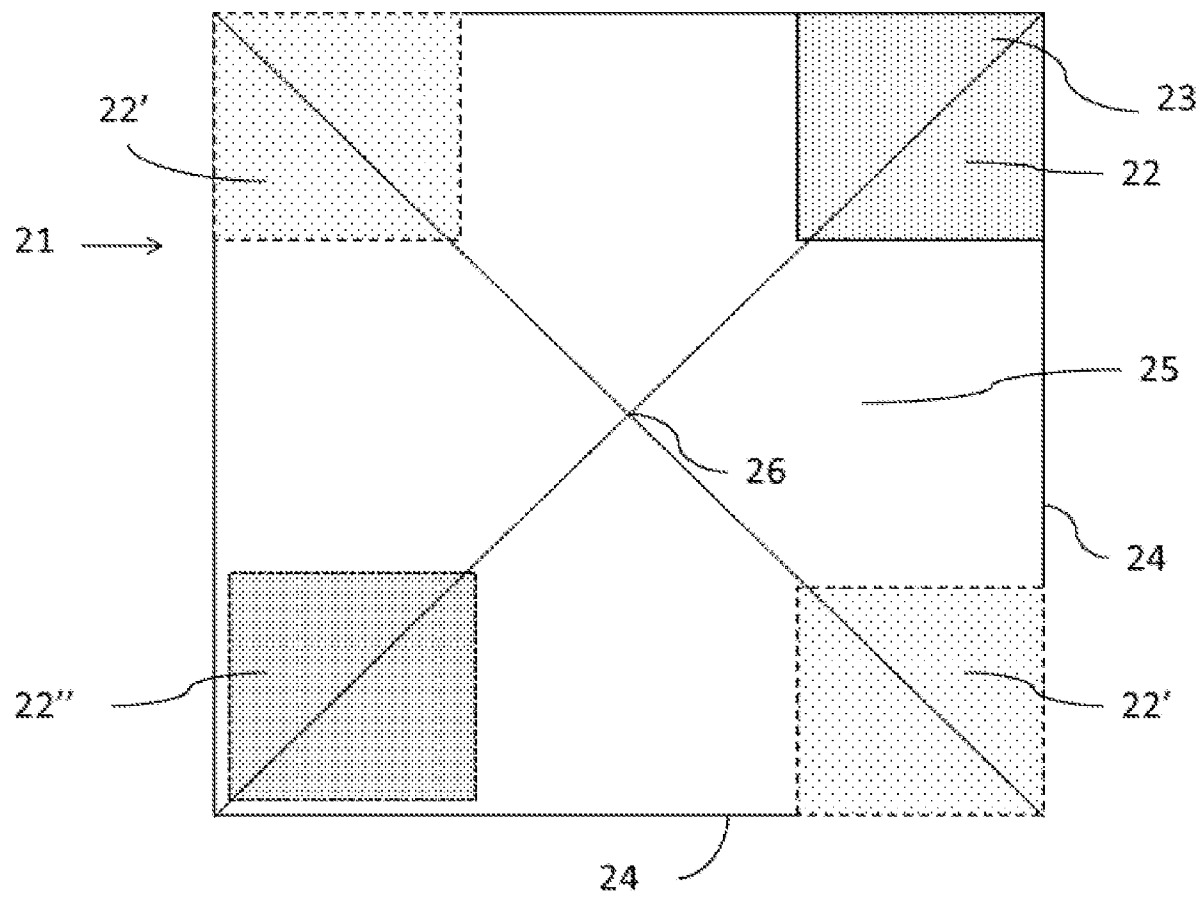


Fig. 3

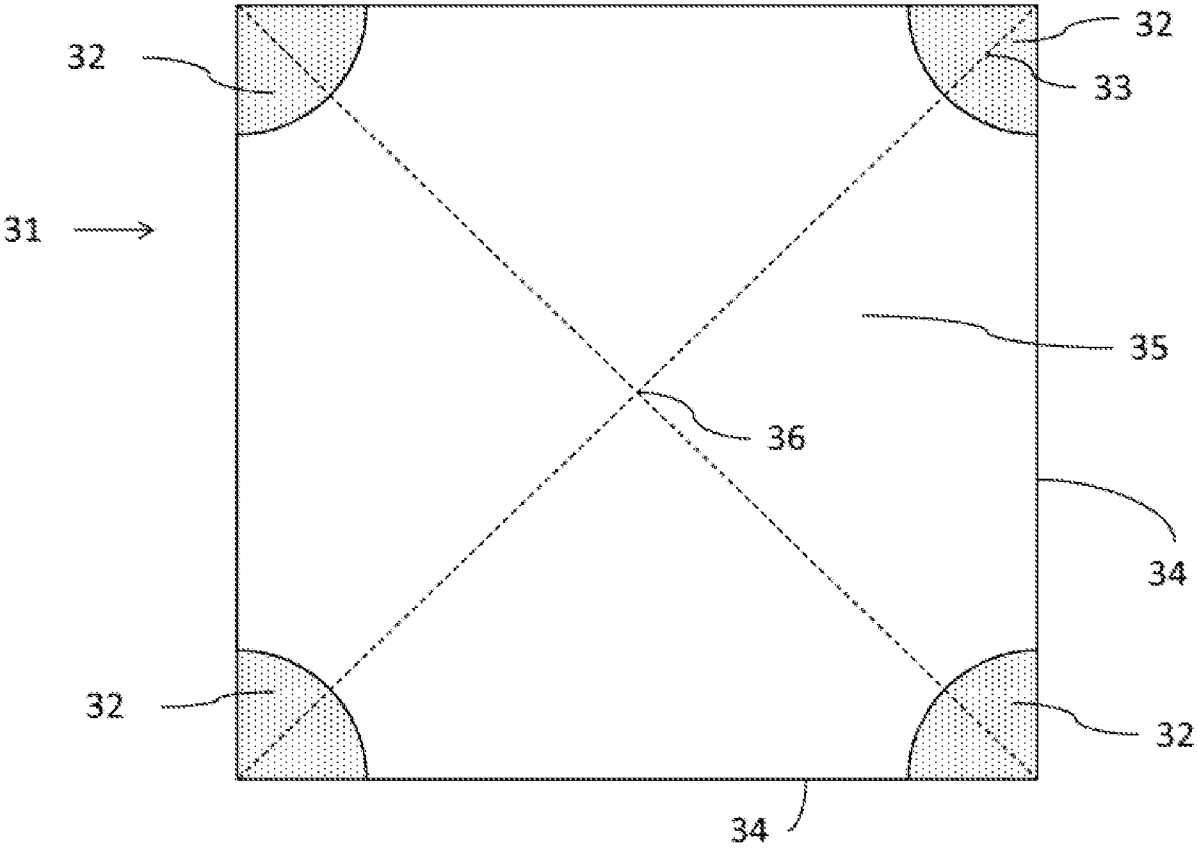
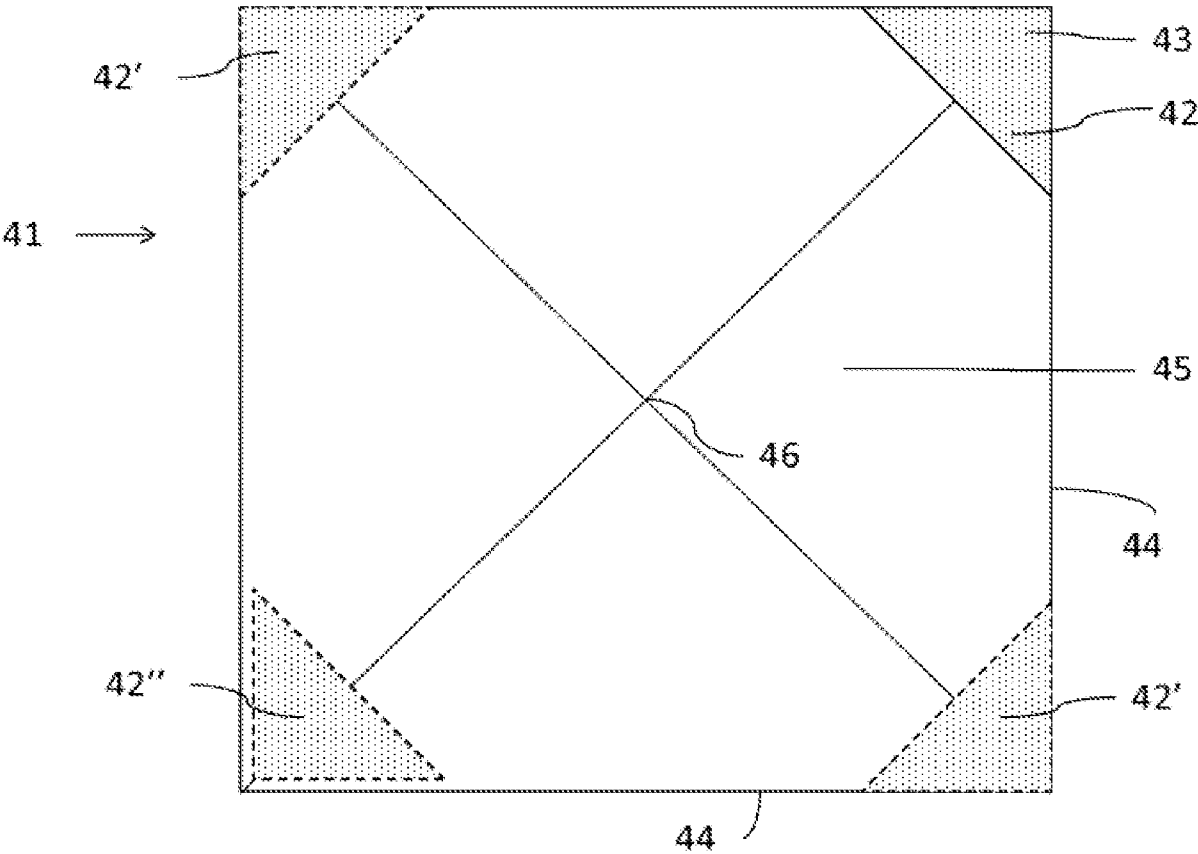


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2015/050562

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A47K, A47L, A61K, A61Q, D21H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 20080127994 A1 (RIPPL CARL G ET AL), 5 June 2008 (2008-06-05); abstract; figure 5; Paragraph [0061],[0064]-[0070] --	1-17
X	US 20070071537 A1 (REDDY KIRAN K ET AL), 29 March 2007 (2007-03-29); abstract; figure 2; Paragraph [0028], [0037]-[0042], [0055] --	1-17
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Date of mailing of the international search report

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