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(71) Applicant (for all designated States except US): **LIGHT-
TEX LIMITED** [GB/GB]; Business Creation Unit, Zo-
chonis Building, Brunswick Street, Manchester M13 9PL
(GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VAN EMDEN,
Oliver** [GB/GB]; 11 Ashcombe Gardens, Edgware,
Middlesex HA8 8HR (GB). **CARR, Chris** [GB/GB]; 20
Fallowfield Close, Littler Cross, Winsford, Cheshire CW7
2NW (GB).

(74) Agents: **SETNA, Rohan, Piloo** et al.; Verulam Gardens,
70 Gray's Inn Road, London WC1X 8BT (GB).

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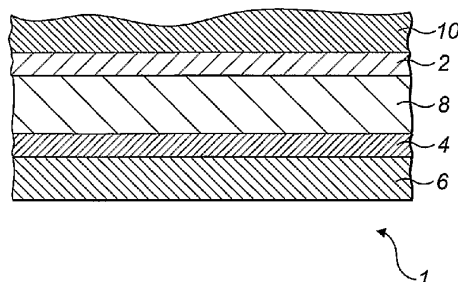
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(54) Title: IMPROVEMENTS IN OR RELATING TO FABRICS



(57) **Abstract:** The present invention relates to a laminate structure suitable for use in fabric articles and on other surfaces that may have liquid water thereon. One embodiment of the present invention is an article of clothing comprising a laminate which includes the following layers: a fabric layer, at least part of which is permeable to water vapour, a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and a second layer comprising one or more sanitary agents, wherein said first layer is interposed between said fabric layer and said second layer, said second layer is, in use, the closest of said layers to the intended wearer of the article of clothing and the fabric layer is irremovably connected directly or indirectly to one or more of the other layers of the laminate.

IMPROVEMENTS IN OR RELATING TO FABRICS

The present invention relates to a laminate structure suitable for use in fabric articles and, in particular, to articles of clothing, footwear, headgear and other items likely to come into contact with a person's skin and its associated perspiration.

Liquid water-impermeable films, coatings or membranes can be adhered or bonded to layers on the inside or outside of garment fabrics. The purpose of these layers is to waterproof the fabric of the garment, primarily to prevent rain ingress through the garment. However, while many of these "traditional" water-impermeable layers are impermeable to liquid water, they are also impermeable to water vapour and as a result are not regarded as "breathable". This technical deficiency can lead to wearer discomfort because of the "build-up" of water vapour/moisture inside the wearer's garment, and the inefficient release of water vapour from inside the garment microclimate.

More recently there has been the development of "breathable" waterproof films, membranes and coatings, which allow the passage of water vapour out of the wearer/garment microclimate, but still prevent liquid water passage. Hence the wearer remains dry and comfortable in the rain. These films/coatings or membranes can be microporous or hydrophilic in nature, and are typically manufactured from polytetrafluoroethylene, silicones, rubbers, polyurethanes, acrylates, polyethers, polyesters, polyolefins, polyamino acids, polyamides or copolymers thereof. "Polyolefins" includes, but is not

limited to polyethylenes. If it is desired to limit the expansion of the first layer when exposed to water, preferably the first layer does not comprise polyurethane. Preferably the films, coatings or membranes comprise a polyolefin. Preferably at least part of, ideally all of, the first layer is hydrophobic and microporous, preferably comprising a hydrophobic microporous membrane comprising a polyolefin, preferably polyethylene. This list is not exhaustive and may contain others not listed here.

10

A feature of impermeable garment constructions is the potential for moisture build-up and subsequent microbial growth leading to odour.

Another feature of high physical activity in humans wearing clothes is the generation of heat and associated perspiration inside the garment, i.e. in the wearer's "microclimate". The perspiration can be absorbed by the garment, which is in contact with the skin, and produce an obvious discolouration, which will appear unsightly and embarrass the wearer. A possible solution to this problem is to apply disposable absorbable pads under the arms. These pads are separable components of the garment, easily visible, but will absorb the moisture. Furthermore disposable breathable pads and liners display other disadvantages in that they tend to be non-reusable or non-washable and thus a user must keep purchasing and adhering the liners or pads to articles of clothing as and when required.

30

It would therefore be advantageous to provide a breathable fabric in which the fabric having improved sanitary properties. It would also be advantageous to

provide a breathable fabric in which sweat and moisture in liquid form could be kept away from a user's skin and wicked away by the breathable fabric.

5 It would furthermore be advantageous to provide fabric articles especially clothing articles, which include breathable material as an integral part of the article, which have sanitary properties, and preferably which prevents visible moisture build-up on or within the
10 article. The visibility of the moisture absorption is important in shirting materials. There is a need to produce a garment or article of clothing that is able to mitigate the visibility from the exterior of the garment of perspiration produced by the wearer.

15

It is therefore an aim of preferred embodiments of the invention to overcome or to mitigate at least one problem of the prior art, whether expressly disclosed herein or not.

20

The present invention provides an article of clothing comprising a laminate which includes the following layers:

a fabric layer, at least part of which is permeable to water vapour,

25 a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and

a second layer comprising one or more sanitary agents, wherein said first layer is interposed between said

30 fabric layer and said second layer, said second layer is, in use, the closest of said layers to the intended wearer of the article of clothing and

the fabric layer is irremovably connected directly or indirectly to one or more of the other layers of the laminate. Preferably, the second layer comprises low denier fibres.

5

The present invention provides an article of clothing comprising a laminate which includes the following layers: a fabric layer, at least part of which is permeable to water vapour, a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and a second layer comprising low denier fibres and, optionally, one or more sanitary agents, wherein said first layer is interposed between said fabric layer and said second layer, and wherein said second layer is, in use, the closest of said layers to the intended wearer of the article of clothing. Preferably, the fabric layer is irremovably connected directly or indirectly to one or more of the other layers of the laminate. Preferably, the fibres are microfibres.

20

"Connected includes", but is not limited to, connected by adhesion or by mechanical means such as sewing. Preferably the connection is by adhesion. Preferably, the fabric layer is irremovably connected either directly or indirectly to each of the other layers in the laminate.

25

"Fabric" includes the definition given in the Collins Concise English Dictionary, published in 2001, as "any cloth made from yarn or fibres by weaving, knitting, felting, etc." In the present context, fabric also include leather, rubber, plastic materials, and other materials mentioned herein, wherein at least part of the fabric layer is permeable to water vapour. The fabric

30

layer is preferably suitable for making clothing garments. Materials such as rubber, leather and plastic not commonly permeable to water vapour may be made permeable by incorporating pores into said materials.

5

The second layer may comprise or consist of yarns comprising fibres. A yarn may be defined as "a continuous twisting strand of natural or synthetic fibres" (Collins Concise Dictionary, 2001 edition). Preferably, the yarns
10 comprise the fibres as herein described. Typically, a yarn will comprise many fibres. "Low denier" is a term known to those skilled in the art. "Low denier" includes, but is not limited to, a denier of 15 or lower, more preferably 11 denier or lower, even more preferably 5
15 denier or lower, still more preferably 3 denier, most preferably lower than 2 denier. A microfibre is a fibre having a denier of 1 or lower. Preferably the microfibres have a denier of 1 or lower, more preferably less than 0.5, more preferably a denier of less than 0.05, most
20 preferably a denier of from 0.005 to 0.05. It has been found that a clothing article in which the second layer comprises low denier fibres, particularly microfibres, is significantly better than the articles of the prior art at wicking moisture away from the skin of a wearer.
25 Preferably the second layer comprises more than 50% low denier fibres, more preferably more than 80% low denier fibres, most preferably more than 95% low denier fibres.

A "laminate" includes in its definition a layered
30 item comprising two or more layers. Said layers may be of different materials and may or may not be bonded together.

At least part of the fabric layer is permeable to water vapour, but the entire fabric layer may be permeable to water vapour. The fabric layer may be impermeable or permeable to liquid water, depending on the intended use
5 of the article of clothing.

At least part of the first layer is permeable to water vapour and resistant to permeation of liquid water, but the entire first layer may have these two properties.

10

Preferably, at least part of the second layer contains one or more sanitary agents. The sanitary agent may be evenly distributed over the entire second layer. Ideally, the second layer should be permeable to liquid
15 water and water vapour, and more ideally all components of perspiration.

Preferably, said first layer comprises a woven, knitted or non-woven fabric.

20

The article is preferably a non-disposable fabric article or fabric-containing article in which one or more of the layers of the laminates is/are adhered to the adjacent layers. Chemical adhesion, as opposed to
25 mechanical adhesion such as sewing, is preferable in adhering the layers together, as this allows a garment to be made in which the laminate is not visible. This is particularly useful when the laminate structure forms part of a garment, for instance being located in the under-arm
30 area of a shirt. It has been found that the laminate is significantly less noticeable in articles in which the laminate layers are chemically adhered together compared to those where the layers have been sewn together. The

articles of the present invention can generally be washed and cleaned without disturbance of the laminate structure and its properties. It has been found that as the laminate structure as a whole is vapour permeable, this
5 enables articles containing the laminate to be ironed or steamed without undue damage to the fabric or article.

The first layer preferably comprises at least one sheet or membrane having a resistance to moisture vapour permeability (breathability) of no more than 15m^2 Pa/W,
10 more preferably no more than 10m^2 Pa/W, still more preferably no more than 6m^2 Pa/W, most preferably no more than 4m^2 Pa/W especially no more than 2m^2 Pa/W.

15 The breathability can be measured using the ISO DIS 11092 test.

The first layer may comprise a woven, knitted or non-woven material, but typically is a coating, film or
20 membrane. The liquid water-impermeable, water vapour-permeable sheet or membrane is preferably non-porous, but may be micro-porous. The sheet or membrane may comprise any suitable materials, such as polytetrafluoroethylene, rubbers, silicones, polyurethanes, acrylates, polyethers,
25 polyesters, polyolefins, polyamino acids, polyamides or copolymers thereof, for example. Suitable commercially available materials include Sympatex(RTM), manufactured by Sympatex Technologies Limited, UK or Faitplast(RTM) films, Faitgom(RTM), thermoplastic polyurethane films or
30 Faitex(RTM) manufactured by Faitplast Corporation.

The sheet or membrane may preferably comprise hydrophilic and/or hydrophobic materials. Preferably, the sheet or membrane includes hydrophilic components.

5 Suitably, the thickness of the sheet or membrane, or the total thickness of the sheets or membranes in the first layer, is no more than 2mm, preferably no more than 1.5mm or more preferably no more than 1mm. Suitably the thickness of the sheet or membrane, or the total combined
10 thickness of the sheets or membranes is at least 0.5µm, preferably at least 0.75µm and more preferably at least 1µm. Preferably the thickness of the sheet or membrane is less than 20µm, more preferably from 5µm to 20µm, more preferably 8µm to 16µm, most preferably, 10 to 14µm.

15 The weight of the sheet or membrane is preferably less than 20 gsm, from 10 to 17 gsm (grams per square metre), more preferably 12 to 16 gsm and most preferably, about 14 gsm.

20 The water vapour transmission rate is preferably in the range 500 to 800 gsm over a 24 hour period, most preferably 600 to 700 gsm over a 24 hour period, more preferably about 650 gsm over a 24 hour period (using the
25 following test: STM 201, ref. ASTM E96 to 96, procedure B).

 The sheet or membrane may be translucent, preferably substantially unpigmented, more preferably transparent and
30 may be colourless.

The sheet or membrane in the first layer is preferably elastic and can preferably be stretched to at least 200% of its resting dimensions in a direction parallel to the plane of the sheet, more preferably at
5 least 300% and most preferably at least 500%, up to rupture at elongation yield point. In some embodiments the sheet or membrane is preferably stretchable to more than 1000% of its resting dimensions.

10 Suitably the sheet or membrane has a tear propagation of at least 50 N/mm, more preferably at least 100 N/mm and most preferably at least 125 N/mm.

The skilled person would appreciate how it would be
15 possible to produce or obtain membranes or sheets with the above properties.

"Sanitary agent" encompasses any agent capable of imparting a sanitary or sanitising characteristic or
20 property, which may be an anti-microbial, biocidal, biostatic, deodorising, or anti-perspirant, for example.

The sanitary agent may be distributed on the surface of fibres that constitute the second layer, within said
25 fibres or a combination thereof. The sanitary agent may be present on the interior of the second layer or distributed on one or both sides of said layer.

The sanitary agent may comprise an anti-microbial
30 agent. The anti-microbial agent may be a biocidal agent, a biostatic agent or both. The anti-microbial agent is preferably an anti-bacterial agent, an anti-fungal agent or both an anti-bacterial and anti-fungal agent.

Suitable anti-microbial agents include, sulphur-containing compounds and/or nitrogen-containing compounds, and other types of anti-microbial agent known to the skilled person.

Suitable sulphur-containing anti-microbial compounds may include thiocarbamates, thiocyanates, isothiocyanates, dithiocarbamates and mixtures thereof, for example.

Suitable nitrogen-containing anti-microbial compounds may include quaternary ammonium compounds, amides, triazine and guanidines, and mixtures thereof, for example.

The sanitary agent may comprise substances which degrade or bind to ammonia, denatured proteins or lactic acid, or any combination thereof. Suitable substances include silver-containing compounds. Silver includes, but is not limited to, Ag(I).

A particularly suitable anti-microbial agent is triclosan (2,4,4' - trichloro-2-hydroxydiphenyl ether) or its derivatives.

Alternatively, the anti-microbial agent may be based on metals, such as, silver-containing compounds, tin-containing compounds, copper compounds, glutaraldehyde or an iodophor, for example.

There may be more than one different anti-microbial agents present in the second layer.

The sanitary agent may comprise a deodorising agent.

The deodorising agent may effect deodorising by a chemical odour-neutralising action, a photo-catalytic
5 reaction or both.

The deodorising agent may also be an anti-microbial agent or have anti-microbial activity.

10 The sanitary agent may comprise an agent capable of encapsulating odour-emitting chemicals. Alternatively the sanitary agent may be in the form of microcapsules per se.

Suitable deodorising agents may include activated
15 carbon, zeolites, inorganic compounds such as silicon metal oxides of titanium (TiO_2), zinc (ZnO) and aluminium, ceramics and ceramic-coated sheath fibres (such as sheath-core biocomponent polyester fibres in which the sheath side includes ceramics).

20 Preferably the sanitary agent comprises both an anti-microbial agent and a deodorising agent, or single agent providing both anti-microbial and deodorising properties.

25 The second layer may comprise a woven, knitted or non-woven textile material cover, finish or sheet. The textile sheet may comprise synthetic or natural material. Preferably, at least part of, and preferably all of, the second layer is suitable for wicking liquid water from a
30 surface with which the second layer is in contact.

Suitable synthetic materials include polyesters, polyamides, polyvinyl alcohols, cellulose (for example

Lyocell, rayon or viscose) and nylon, and mixtures thereof, for example. Suitable natural materials include cotton, linen, flax, hemp, jute, wool and mixtures thereof, for example. The textile sheet may comprise a
5 mixture of synthetic and natural materials.

The second layer may comprise a single sheet or may comprise a plurality of layers and said layers may be laminated by heat, mechanical or chemical means.

10

Particularly suitable sheet materials for use in the second layer include those containing Claretta(RTM) SP-99 fibres, manufactured by Kuraray Co., Ltd Japan and Takeda Chemical Industries Ltd, Japan as well as BIOSAFE (RTM)
15 fibres, manufactured by Kanebo Ltd, Japan and Biofresh(RTM) antimicrobial fibres from Sterling Fibres, UK.

The second layer preferably comprises one or more
20 sheets comprising nylon, polyester, viscose or a mixture thereof. If the second layer comprises both polyester and viscose, preferably the polyester to viscose ratio is, by weight, 30:70 to 70:30, more preferably 40:60 to 60:40, and most preferably 45:55 to 55:45. Preferably, the
25 fibres of the second layer are 100 % polyester woven microfibres.

Suitably the second layer has a thickness of no more than 1cm, preferably no more than 5mm, more preferably no
30 more than 2mm and most preferably no more than 1mm. The second layer may have a weight lower than 400 gsm. Preferably, the second layer has a weight of from 10 to 50

gsm, more preferably 12 to 35 gsm and most preferably 15 to 30 gsm.

Polyester has been found to aid in the wicking of
5 liquid moisture from a person's skin and viscose has been found to be a good absorbent of moisture. The combination of these two materials in a fabric allows for sweat to be removed quickly from a person's skin when in contact with a laminate of the present invention. In any of the
10 laminates of the present inventions, preferably the second layer comprises low denier fibres comprising polyester, nylon or a mixture thereof.

An absorbent may also be disposed adjacent the first
15 layer, and preferably disposed between the first and second layers. The absorbent may be in the form of a layer, which may be a continuous layer between the first and second layers, or alternatively as discrete particles. The absorbent layer may comprise a sheet of material
20 capable of absorbing moisture. The sheet may comprise any suitable absorbent material, such as a synthetic material, cotton or an absorbent material applied to the textile fibre, or micro fibres. Preferably, the absorbent comprises a cellulosic fibre. Examples of cellulosic
25 fibres include, but are not limited to, cotton, viscose, woodpulp. Cotton has been found to be particularly preferred.

Preferably the absorbent layer has a thickness of at
30 least 2µm, more preferably at least 5µm and most preferably at least 10µm.

The resultant fabric article may be impregnated with or coated with a layer of anti-microbial agent, (separate to any anti-microbial agent comprising or within the sanitary agent). Suitable anti-microbial agents for
5 impregnating or coating the article include Tinosan HP100 (RTM), supplied by CIBA-Geigy Inc. Coating or impregnating the article prevents bacteria or other micro-organisms from entering the article from the exterior of the article through airborne contaminants such as sweat,
10 smoke and the like.

Preferably, said first layer comprises a sheet or membrane that is permeable to water vapour and resistant to the permeation of liquid water.
15

Preferably, the article is selected from a shirt, T-shirt, pullover, male or female brief, bra, cardigan, skirt, dress, blouse, trousers, shorts, sock, tie, pair of jeans, glove, coat, jacket, boxing glove, mitt.
20

The laminate structure may stretch over the entire article, or it may be located in parts where absorption of perspiration is most required. For a shirt, for example, the laminate may be located in the armpit region and/or
25 over at least part of the back of the shirt.

The article may be an item of footwear. Preferably, the footwear is selected from shoes, boots, slippers, sandals, sports shoes, trainers.
30

The articles of clothing the present invention are suitable have improved sanitary qualities over those of the prior art.

The present invention further provides an article for making clothing comprising a laminate as herein described. Said article for making clothing may be in the form of a
5 laminate sheet comprising a fabric layer, a first layer and a second layer as herein described.

The present invention also provides a method of manufacturing an article of clothing comprising an outer
10 fabric permeable to water vapour, said method comprising:
 providing a fabric which will form the outer fabric of the article of clothing,
 providing a first layer of material that is permeable to water vapour and resistant to the permeation of liquid
15 water,
 providing a second layer of material comprising one or more sanitary agents, and
 adhering said first layer of material to at least part of one side of the fabric intended to form the outer
20 fabric, said one side of the fabric intended to be towards the interior side of the article of clothing,
 adhering said second layer of material to at least part of one side of the first layer, said one side of the first layer intended to be towards the interior side of
25 the clothing, and
 forming said fabric into the article of clothing, said first layer being on the interior side of the outer fabric in the article of clothing.

30 The present invention further provides a method of manufacturing an article of clothing comprising an outer fabric, said method comprising:

providing a fabric which will form the outer fabric of the article of clothing,

providing a first layer of material that is permeable to water vapour and resistant to permeation of liquid

5 water,

providing a second layer of material comprising one or more sanitary agents, and

providing an absorbent material,

adhering said first layer of material to at least
10 part of one side of the fabric, said one side intended to be the interior side of the article of clothing,

adhering said absorbent layer of material to the side of first layer of material not adhered to the outer fabric and

15 adhering said second layer of material to the side of absorbent layer of material not adhered to the first layer of fabric and

forming said fabric into the article of clothing, said first layer being on the interior side of the outer
20 fabric in the article of clothing.

By "outer fabric", this is meant relative to the other fabrics in the laminate when in use and does not preclude other exterior fabrics being present on the
25 "outer fabric".

Preferably, at least one or more of said layers is adhered to one or more of its adjacent layers. The adhesion may be achieved by using any one of liquid
30 adhesives, flame lamination or powder adhesive, or a mixture thereof.

Said adhesive is preferably distributed in spot locations on each layer and is not uniformly distributed over each layer.

5 The present invention also provides a use of a laminate structure in an article of clothing to prevent or mitigate the visibility, from the exterior of the clothing, of a wearer's perspiration in the region of said laminate, and allow transmission of said water from said
10 perspiration through the clothing, wherein said laminate includes the following layers:

 a fabric layer, at least part of which is permeable to water vapour, said fabric layer being optionally the exterior layer of said article of clothing,

15 a first layer disposed, in use, on at least part of the interior side of said fabric layer wherein, said first layer is permeable to water vapour and resistant to the permeation of liquid water, and said first layer comprises or consists of an unpigmented translucent membrane or
20 sheet that has a thickness of from 5 μ m to 20 μ m and a weight of from 11 to 17 gsm, and

 said laminate further comprises a wicking layer disposed, in use, on the interior side of said first layer, and said wicking layer comprising polyester,
25 viscose or a mixture thereof.

 The laminate construction may be as defined above in relation to the article of clothing of the present invention. Preferably, in the use of the present
30 invention, the laminate further comprises a wicking layer disposed, in use (i.e. when worn by a wearer), on the interior side of said first layer, and said wicking layer comprise polyester, viscose or a mixture thereof. Said

wicking layer may comprise the same components as the second layer mentioned in connection with the article of clothing of the present invention.

5 It has been found that the laminate construction may also be applied to other articles that may come into contact with human or animal body and their associated perspiration or surface which may be damp, such as the interior side of house walls or the surface of domestic
10 pipes. Further embodiments of the present invention will be discussed below. The embodiments below use the same nomenclature for the layers of their laminates as those for the article of clothing. The preferences detailed above for each layer of the laminate, and the associated
15 parts of the laminate, such as the absorbents and methods of adhering the layers are also applicable to the embodiments below.

The present invention also provides an article for
20 covering a piece of furniture, said article comprising a laminate which includes the following layers:

a fabric layer, at least part of which is permeable to water vapour and liquid water,

a first layer, at least part of which is permeable to
25 water vapour and resistant to permeation of liquid water, and

a second layer, at least part of which contains one or more sanitary agents, and

optionally, an absorbent,

30 wherein said second layer is interposed between said fabric layer and said first layer, said absorbent, if present, is located between said first layer and said second layer and said fabric layer which is permeable to

water vapour is, in use, the closest of said layers towards the exterior of said piece of furniture.

Furniture is defined in the Collins Concise English Dictionary, published 2001, as "movable articles that equip a room, house, etc." This encompasses items such as sofas, chairs, stools and beds, and for the present purposes also encompasses items such as cushions and pillows typically found on or near furniture where such items are typically covered with a fabric likely to come into contact with a person's skin. The article for covering a piece of furniture may replace existing covers for pieces of furniture, or may provide an additional cover which is intended to cover at least part of an existing cover.

In this embodiment, the second layer may be the first layer, i.e. a fabric layer comprising one or more sanitary agents.

20

Preferably, one or more of said layers is/are adhered to one or more of the adjacent layers in the laminate.

The article for covering a piece of furniture may be an article of bed linen. Said Bed linen may be selected from a pillow case, a quilt cover or a laminate bed sheet.

The present invention also comprises an article of furniture comprising a covering of the present invention.

30

The article of furniture comprising a covering of the present invention may be selected from a chair, sofa, wheelchair, car seat, mattress or stool seat.

The present invention also provides an article for covering a handle-grip, said article comprising a laminate which includes the following layers:

5 a first layer, at least part of which is permeable to water vapour and resistant to the permeation of liquid water, and

 a second layer, at least part of which contains one or more sanitary agents, and

10 wherein said second layer, in use, is the closest of said first and second layers towards the exterior of said handle-grip.

 Preferably, said article for covering a handle-grip
15 further comprises an absorbent. Said absorbent may be located between said first layer and said second layer.

 The present invention also provides a handle-grip comprising an article for covering a handle grip of the
20 present invention.

 Handle-grips, and particularly those on sports equipment, that come into frequent contact with human perspiration would find the handle-grip covering to be
25 particularly advantageous in improving the sanitary properties of the handle-grip.

 The present invention also provides a receptacle, said receptacle comprising a laminate which includes the
30 following layers:

 a fabric layer, at least part of which is permeable to water vapour and liquid water,

a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and

a second layer, at least part of which contains one
5 or more sanitary agents, and

optionally, an absorbent,

wherein said second layer is interposed between said fabric layer and said first layer, said absorbent, if present, is located between said first layer and said
10 second layer.

In this embodiment, the second layer may be the first layer, i.e. a fabric layer comprising one or more sanitary agents.

15

The laminate may be of two orientations relative to the exterior of the article. In one orientation, said fabric layer is closest of said layers to the exterior of said receptacle. This particular orientation is most
20 suitable for receptacles, the exterior of which is most likely to come into contact with human skin and its associated perspiration. Said receptacle may be selected from a rucksack, a holdall, a suitcase, handbag, shoulder bag, purse, wallet, beach bag or sports bag.

25

In an alternative orientation of the laminate in said receptacle, said fabric layer is closest of said layers in the laminate to the interior of said receptacle. This orientation would be most appropriate when the interior of
30 said receptacle is likely to come into contact with human skin and its associated perspiration. Preferably, said receptacle is a sleeping bag.

The fabric may comprise a textile article or material or an article comprising a layer of textile material based on knitted, woven or nonwoven structures. The fabric material can be based on man-made synthetic fibres or
5 natural fibres.

The present invention further provides an article for covering or incorporation into a floor, wall or ceiling, said article comprising a laminate which includes the
10 following layers:

a fabric layer, at least part of which is permeable to water vapour,

a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water,
15 and

a second layer, at least part of which contains one or more sanitary agents, and

optionally, an absorbent,
wherein said second layer is interposed between said
20 fabric layer and said first layer, said absorbent, if present, is located between said first layer and said second layer.

The present invention further provides an item
25 comprising an article for covering or incorporation into a floor, wall or ceiling of the present invention. The wall, floor or ceiling surfaces may be the interior surfaces of a room, in, for instance, a domestic house. If the article is used to cover wall, floor or ceiling surfaces,
30 the laminate may be in two alternate orientations. In a first orientation, the second layer may be closest of the laminate layers to the surface being covered. In a second

orientation, the second layer may be the furthest of the laminate layers from the surface being covered.

The article for covering or incorporation into a
5 floor, wall or ceiling may be selected from a rug, a
carpet, bath mat, wall paper, tiles, floor board,
structural members of a wall, floor or ceiling, the fabric
roof of a cabriolet car. Said rug, carpet, bath-mat , wall
paper, tiles, floor board, structural members of a wall,
10 floor or ceiling may be for a domestic use, and said
fabric layer may comprise fabrics typical of carpets,
rugs, or bath mats known to those skilled in the art. The
article may be for use in relatively damp domestic
conditions, such as a bathroom.

15

Said wall may be the wall of a receptacle. Said
receptacle may be a receptacle that is not water
resistant, of instance a receptacle comprising or
consisting of paper, such as card board.

20

The laminate of the present invention could be used in
wallpaper or wall/ceiling construction in order to protect
structures against condensation and the growth of fungi,
mould etc. Condensation has become one of the most common
25 causes of dampness within buildings. A report by the
British building research establishment estimated that 1.5
million homes in the UK are badly affected by
condensation. Condensation occurs when warm moist air is
cooled that it no longer has the capacity to hold so much
30 water in vapour form. Typically this can be seen to incur
cold surfaces such as window panes as mist or cold water
pipes as droplets of water. Moisture from condensation can

assist in spreading bacteria and also causes illnesses such as asthma.

Ideally to reduce moisture, and hence condensation, in a domestic environment, it is recommended that the
5 environment's humidity is reduced, air circulation, insulation and back ground heating are improved..

The present invention provides a laminated article comprising a laminate as described herein. Said laminated
10 article may be for industrial use. An industrial use is one for which the article is necessarily durable and resistant to tear. The fabric layer of such an industrial article may comprise or consist of a toughened material, including, but not limited to, Kevlar.

15

The laminate constructions of the present invention improves insulation (the first layer, which preferably comprises a membrane), reduces humidity (wicking layer) and thus improves air circulation. The laminate
20 constructions will prevent liquid moisture passing through the laminate but still allow passage of vapour and air through the laminate. Thus, this would prevent the spread of water, leaks and its associated bacteria and mould growth. The fabric not only acts as a barrier to bacteria,
25 fungi and mould but in fact degrades them. It also is self drying. The fabric can be used on the underside of tiles, carpets, floor boards, wallpaper, between wall structures, ceilings, roofs and around piping especially hot and cold systems including air conditioning. The laminate
30 construction may also be incorporated or be used to form storage sheets, even inside cardboard boxes in order to protect the goods. The fabric could also be incorporated into the soft tops of cars, as at present mould appears to

grow on the inside due to moisture condensation and pet baskets or mats.

The present invention further provides an article for
5 covering piping, said article comprising a laminate which includes the following layers:

a first layer, at least part of which is permeable to water vapour and resistant to the permeation of liquid water, and

10 a second layer, at least part of which contains one or more sanitary agents.

wherein said second layer, in use, is the closest of said first and second layers towards the piping. Said laminate further comprises a fabric layer, and said first
15 layer is interposed between said fabric layer and said second layer.

The articles of clothing of the present invention may further be selected from laces and bandages. The
20 laminate construction may be further applied to linen and curtains, mattresses and fabrics for covering interior parts of vehicles, such as car seats.

The fabric layer may comprise a non-textile material.
25 Suitable non-textile materials include, but are not limited to, rubber, plastics material, wood, metals (including alloys), stone, aggregates, composite materials, glass, ceramics materials. The fabric layer may comprise part of an article comprising non-textile
30 materials or an article per se, for example the fabric may comprise rubber surfaces on sports equipment, rubber handles or the like; plastics surfaces such as toilet seats, plastic handles, hair brushes, plastic bags,

baskets furniture or cutlery; metal or wood surfaces on furniture, taps/faucets, cutlery, ceramics tiles or surfaces; or medical plaster casts. The fabric may comprise a toughened material such as Kevlar, especially
5 if used for covering or incorporation into wall, floor or ceiling, or for covering piping.

The present invention will be now be described further, by way of example only, with reference to the
10 following drawings, in which:

Figure 1 illustrates a part cross-sectional view of a laminate for use in an article of clothing of the present invention;

Figure 2 illustrates a part cross-sectional view
15 of a laminate for use in a covering of the present invention suitable for a handle grip.;

Figure 3 illustrates an article of clothing of the present invention, more specifically a shirt in which the armpit regions of the shirt have a laminate construction;
20 and

Figures 4a, 4b, 4c and 4d show a cross sectional view of a laminate article of the present invention at various magnifications (x45, x90, x180 and x360, respectively). In this particular laminate, the vapour permeable, liquid
25 impermeable membrane may be seen interposed between a non-woven polyester layer and the woven material suitable for use in a shirt. The polyester glue is also shown in these cross-sectional Figures.

30 Examples

We refer firstly to Figure 1, which illustrates a preferred embodiment of a fabric article of clothing of

the present invention, located next to a person's skin. More specifically, Figure 1 shows the laminate construction of said article. The fabric article 1 comprises a second layer 2 in the form of a layer of
5 Claretta(RTM) SP-99 fabric, which comprises the sanitary agent having a double deodorising mechanism which provides (a) a chemical neutralising reaction and (b) a photocatalytic reaction. The sanitary agent within the Claretta(RTM) SP-99 is a ceramic deodorant agent mixed in
10 with the polyester fibres (sheath-side) of the material. Connected to one side of the inner layer 2 is an intermediate layer 8 comprising 100% cotton to provide a super absorbent layer. Connected to the other side of the intermediate layer 8 is a first layer 4 consisting of a
15 Sympatex(RTM)10-micrometre membrane, which is liquid impermeable but vapour permeable. Integral with the first layer 4 is an outer fabric 6 consisting of the fabric material of a cotton shirt. Integration of the first layer 6 and fibre 6 is achieved by weaving the fibres of
20 the first layer 4 into the fabric 6 during manufacture of the article 1. The fabric article 1 shown in Figure 1 is shown next to a person's skin 10 such that the second layer 2 is located abutting the person's skin 10.

25 In use a person puts on the fabric article 1, which is in the form of a shirt defined by the outer fabric 6. When the user perspires, perspiration from the skin 10 will firstly traverse to the second layer 2, where any bacteria and or odours will be neutralised, substantially,
30 by the double deodorising mechanism, which provides deodorising and anti-microbial action. Any moisture will then travel through the second layer 2 to the intermediate layer 8 where the moisture will be absorbed by the cotton

of the intermediate layer 8 in order to wick the moisture from the skin 10 or the person. The moisture present in the intermediate layer 8 will then contact the first layer 4 of Sympatex(RTM). The Sympatex (RTM) fabric membrane enables water vapour to traverse through the first layer 4 but prevents liquid moisture from traversing the layer 4. Thus perspiration in the form of vapour is able to traverse the first layer 4 whereas any patches of liquid perspiration will remain within the absorbent intermediate layer 8, until the person's body heat vaporises the liquid, such as it may then traverse through the first layer 4. Any vapour passing through the first layer 4 will then traverse to the fabric 6, which consists of the polyester shirt fabric, and be wicked out of the fabric article 1.

Thus the fabric article 1 provides an article of clothing in which perspiration from a user is firstly neutralised in terms of odour and bacteria by the second layer 2; large quantities of perspiration are absorbed by the intermediate super absorbent layer 8; liquid perspiration is retained within the super absorbent layer 8 whilst vapour is wicked through the liquid impermeable, vapour permeable first layer 4 and out of the fabric of the outer fabric 6. Thus bacteria and liquid, which discolour normal clothing fabrics, are prevented from reaching the fabric material of the fabric 6, and thus discolouration is prevented or mitigated. Furthermore, the liquid impermeable first layer 4 prevents any liquid falling on the outside of the fabric article 1 from passing the first layer 4, and through the intermediate 8 and second 2 layers to the wearer's skin 10. Thus is the

fabric article 1 is worn by a user in rain or showers, the user will remain substantially dry.

The second layer 2, consisting of Claretta(RTM) SP-99 material, is effective for deodorising a wide range of odours, not only from a user's perspiration, but from odours that may travel through the fabric article 1 from the outside of the article towards the user's skin such as cigarette smoke, pet and food odours. The second layer 2 itself has a double deodorising mechanism absorbing malodours and degrading the chemical constituents of the odours. The photo-catalyst component of the second layer 2 continues to react as long as there is an odour, as the photo-catalyst has no saturation point. The sanitary agent present within the second layer 2 is maintained after repeated washing of the fabric article 1 as the agent is integrated into the fibres of the Claretta(RTM) SP-99 material. Many other materials may be used in the second layer 2 other than Claretta(RTM) SP-99. Any suitable synthetic or natural material, whether fibrous or not, and whether non-woven or woven may be used, when combined with a sanitary agent.

The intermediate layer 8 is 100% cotton, which has excellent moisture absorbing properties. The cotton may be interweaved with the second layer 2 and or first layer 4, or may be laminated, connected or adhered thereto. "Laminated" in these Examples includes in its definition 'adhered in the form of a layer by means of heat or otherwise'. "Adhered" includes in its definition 'adhering by heat or chemical means', but not necessarily in a layered form. The intermediate layer 8 not only serves as an absorbent layer, but bulks out the fabric article 1 to

regulate the speed at which any moisture or odour entering the fabric article 1 will traverse through the article. The cotton material of the absorbent layer 8 is suitable for repeated washing and has excellent durability. Many
5 other types of material may be used for the absorbent layer 8. Super absorbent polymers and synthetic materials may be used, which may have higher moisture absorbency than cotton.

10 The first layer 4 comprises a Sympatex(RTM)10-micrometer membrane, which individually has a breathability (resistance to moisture vapour permeability) of approximately 1.7m^2 Pa/W, (according to ISO DIS 11092). When laminated to intermediate layer 8 and fabric 6, the
15 breathability is still less than 13m^2 Pa/W. The first layer 4 is a non-porous polyester membrane comprising hydrophilic zones. It is wind and water resistant but highly breathable to water vapour. The material is light, durable and is stretchable (can be stretched up to 300 per
20 cent elongation at rupture in any direction). The layer 4 can be integrated with woven, non-woven, knitted and fleece fabrics or leather fabrics or non-fabric material. The first layer 4 is also machine washable and dry cleanable and repeated washing is possible. The first
25 layer 4 is integrated to the fabric 6 by any suitable method. The second layer 4 also has temperature resistance from between minus 40°C to 215°C and retains its breathability within this temperature range. The Sympatex 10-micrometre membrane also has a tensile
30 strength of between one and one hundred N/mm^2 (Mpa) and a tear propagation of up to one hundred and fifty N/mm^2 . The fabric article 1 is washable and re-usable. The fabric 6 in this embodiment is a cotton shirt fabric, but

maybe any suitable clothing fabric, footwear fabric, headgear fabric. The fabric 6 may also be fabric of an article other than clothing, headgear or footwear, and may be for example be a surface or fabric material of upholstery, carpet, rugs, linen, curtains, mattresses, bags, rucksacks, sleeping bags, holdalls, suitcases, bedclothes, laces, medical bandages and plasters, furniture surfaces (such as chairs, sofas, couches, wheelchair etc). The outer fabric 6 may also be a non-fabric material layer such as part of a surface of a non-fabric article. Suitable articles which may form the third layer 6 include rubber, plastics, wood, metals, stone, aggregates, composite materials, glass, ceramic materials and the like. The third layer 6 may comprise a rubber surface on sports equipment, handles and the like; plastic surfaces such as toilet seats, handles, hair brushes, plastic bags, baskets, furniture and cutlery; metal or wood surfaces on furniture, taps, faucets or cutlery or ceramics tiles or surfaces for example.

20

The following Examples illustrate tests carried out on fabric articles of the present invention.

Example 1

25 A first fabric construction, based on an outer polyester/ cotton (65%/35%) fabric laminated to a perspiration impermeable, water vapour polyurethane permeable hydrophilic membrane, and an inner polyester/ viscose nonwoven fabric layer bonded to the membrane (said non woven fabric layer containing 55% polyester and 45% viscose, by weight, and having a weight of 32gsm; said membrane having a thickness of 12 microns) was

manufactured into a first shirt garment. The inner fabric layer comprised 1% triclosan, by weight.

A second fabric construction, based on an outer
5 polyester/ cotton (65%/35%) fabric laminated to a
perspiration impermeable, water vapour permeable
microporous polyethylene membrane of 12 microns thickness,
and an inner 100% microfibre polyester woven fabric layer
bonded to the membrane (said microfibre layer having a
10 weight of 30 to 40 gsm; said membrane having a thickness
of 12 microns) was manufactured into a second shirt
garment.

Five human subjects wearing the shirts then undertook
15 vigorous activity in order to generate perspiration. A
panel of assessors evaluated the shirt wearers appearance
in order to detect obvious visual staining of the shirt by
the perspiration from the wearer's skin. Little or no
staining/ discolouration of the exterior of the shirts was
20 observed. Little or no odour from the exterior of the
shirts was detected.

The same shirt wearers were subsequently tested under
identical conditions wearing polyester/ cotton shirts,
25 with no membrane or inner nonwoven layer, and all
assessors detected obvious discolouration of the exterior
of the shirt by the absorption of the perspiration from
the skin on the interior of the shirt. Odour transmission
was detected from the exterior of the shirt.

30

Example 2

The test conditions in Example 1 were repeated, but
in this example the shirt wearers wore shirts constructed

of the identical polyester/cotton material but the
"breathable" membrane/ polyester/viscose nonwoven was only
located in a section specifically under the armpit region,
as shown in Figure 3. Again the assessors observed no
5 odour transmission and no perspiration discolouration of
the fabric in the region where the liquid impermeable
barrier layer was present.

Example 3

10 A further benefit of the novel shirt construction
identified by the trial wearers was the perceived
"comfort" of the garments under test conditions due to the
dissipation/release of water vapour inside the garment.
This feature is a result of the "breathability" of the
15 membrane layer. In similar evaluations of non-breathable
constructions the wearers observed an obvious increase in
garment microclimate temperature and moisture, leading to
discomfort.

20 Example 4

The novel perspiration impermeable, water vapour permeable
garments were subjected to repeated domestic laundering,
tumble drying, and ironing cycles and the non-
discolouration performance of the shirts, by the
25 perspiration, was unaffected after the wash/ wear
processing.

The second fabric construction was found to offer
superior qualities over the first construction as the
30 polyurethane was found to expand on wetting, whereas the
polyethylene did not seem to expand as much, if at all.
The microfibrres also displayed significantly improved
wicking properties over the cotton/viscose blend. After

continuous wear, the shirts that comprised triclosan were noticeably more pleasant in their odour than those made without triclosan.

5 We turn now to Figure 2 which shows a second preferred embodiment of a fabric article of the invention. The fabric article is similar to that shown in Figure 1, and like numerals represent like components. In the embodiment shown in Figure 2 the article 1 consists of a
10 second sanitary layer 2 thermally laminated to a first layer 4 which is liquid impermeable and vapour permeable, and to which is integrally woven a fabric layer 12 comprising part of the rubber surface of an exercise bike handle. The second and first surfaces 2 and 4 are
15 identical to those in Figure 1, and comprise Claretta(RTM) SP-99 and Sympatex(RTM) materials respectively. The fabric 12 comprises latex rubber. When a user grips the rubber handle 12 of the exercise bike, any perspiration from their hands will first of all travel into the second
20 layer 2 and be deodorised by the sanitary agents contained therein. Perspiration then travels into the first layer 4 where it is prevented from traversing into the rubber third layer 12. An intermediate layer may be connected between the first and second layers 4 and 2, the
25 intermediate layer being an absorbent layer. Thus with an intermediate layer present, perspiration from the user's hand would be trapped within the absorbent layer, and thus prevent the rubber handle 12 from becoming slippery, thereby increasing the grip of the user on the handle.

30

In further embodiments (not shown) the second layer 2 may be omitted, such that the article does not comprise a sanitary layer or agent, or the second layer 2 may be

omitted but the fabric article 1 be impregnated or coated with a separate sanitary agent, such as impregnating the first layer 4 or an absorbent layer with a sanitary agent.

5 Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and
10 documents are incorporated herein by reference.

 All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or
15 process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

 Each feature disclosed in this specification
20 (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series
25 of equivalent or similar features.

 The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features
30 disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

The present invention thus provides a number of articles containing a laminate construction comprising a perspiration impermeable, water vapour permeable layer in combination with a sanitary layer. The articles of the present invention assist in the removal of liquid perspiration from the skin of a person in contact with said article and the articles have improved sanitary properties over those known in the prior art.

10

It has been found, particularly for articles of clothing of the present invention, the laminate construction and the use of vapour permeable, liquid impermeable materials results in articles which reduce water-marks/stains visible from the outside of the article resulting from the wetting of the interior side of the article.

In addition to the absence of visible perspiration staining, the fabric/garment construction reduces odour transmission and improves the hygienic properties of an article.

The incorporation of anti-microbial reagents or fibres into either the outer face textile or the inner lining textile will reduce or eliminate the perspiration-enhanced odour/ microbial development.

The ideal fabric/garment construction is based on an outer textile based face fabric, an inner "breathable", waterproof layer, and an inner 100% polyester microfibre nonwoven substrate impregnated with an anti-microbial agent.

The location of the multiple layered waterproof breathable "fabric" construction can be either as a localised panel, such as under the armpit region of a shirt or T-shirt, or as a complete garment.

The breathable layer and textile fabrics can be laminated together using liquid adhesives, flame lamination or powder adhesives. Preferably, the adhesive is not uniformly located over the fabric/ breathable layer interface, but in localised spot locations.

In addition to anti-microbial reagents applied to the fabrics, crease resist agents, water repellent, oil repellent and softeners may also be applied. This list may be typical of finishes to be applied to the multi-layered textile article. Other finishes known to the skilled man may be added to the laminate or layers of the laminate either before or after construction of the article therefrom.

The fabric/garment construction is typically stable to laundering in domestic washing machines and the non-discolouration performance is unaffected.

Ironing of the laundered, waterproof breathable garment does not appear to affect non-discolouration performance.

In the article of clothing of the present invention, preferably the fabric layer forms at least part of the exterior layer, in use, of the article of clothing. The fabric layer may form substantially all of, or all of, the

exterior layer of the article of clothing. The article of clothing may be an article of inner wear, including, but not limited to, a shirt, a t-shirt, trousers, shorts, gloves, socks, underwear, and other examples of inner wear
5 mentioned herein. "Inner wear" indicates an article of clothing, wherein a substantial part of, or all of, its innermost layer, in use, would generally be in direct contact with a wearer's skin.

Claims:

1. An article of clothing comprising a laminate which includes the following layers:
- 5 a fabric layer, at least part of which is permeable to water vapour,
- a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and
- 10 a second layer comprising one or more sanitary agents, wherein said first layer is interposed between said fabric layer and said second layer,
- said second layer is, in use, the closest of said layers to the intended wearer of the article of clothing
- 15 and
- the fabric layer is irremovably connected directly or indirectly to one or more of the other layers of the laminate.
- 20 2. An article of clothing as claimed in claim 2, wherein the second layer comprises low denier fibres.
3. An article of clothing comprising a laminate which includes the following layers:
- 25 a fabric layer, at least part of which is permeable to water vapour,
- a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and a second layer comprising low denier fibres and,
- 30 optionally, one or more sanitary agents,
- wherein said first layer is interposed between said fabric layer and said second layer, and said second layer

is, in use, the closest of said layers to the intended wearer of the article of clothing.

4. An article of clothing as claimed in claim 3, wherein
5 the fabric layer is irremovably connected directly or indirectly to one or more of the other layers of the laminate.

5. An article of clothing as claimed in any one of claims
10 2 to 4, wherein the fibres are microfibres.

6. An article as claimed in any one of the preceding claims, wherein said first layer comprises a woven, knitted or non-woven fabric.

15 7. An article as claimed in any one of the preceding claims, wherein said first layer comprises a sheet, membrane or coating that is permeable to water vapour and resistant to the permeation of liquid water.

20 8. An fabric article as claimed in any one of the preceding claims, wherein said sheet, membrane or coating comprises polytetrafluoroethylene, rubbers, silicones, polyurethanes, acrylates, polyethers, polyesters,
25 polyolefins, polyamino acids, polyamides or copolymers thereof.

9. An article as claimed in any one of the preceding claims, wherein said first layer comprises a sheet or
30 membrane that has a water vapour permeability of no more than $4\text{m}^2 \text{ Pa/W}$

10. An article as claimed in claim 9, wherein said first layer comprises a sheet or membrane that has a water vapour permeability of no more than 2m^2 Pa/W.

5 11. An article as claimed in any one of the preceding claims, wherein said first layer comprises one or more hydrophilic components, microporous components or semi-permeable components, hydrophobic components, or any combination thereof.

10

12. An article as claimed in any one of the preceding claims, wherein the thickness of the first layer is from $5\mu\text{m}$ to $20\mu\text{m}$.

15 13. An article as claimed in claim 12, wherein the thickness of the first layer is from $8\mu\text{m}$ to $16\mu\text{m}$.

14. An article as claimed in claim 13, wherein the thickness of the first layer is from $10\mu\text{m}$ to $14\mu\text{m}$.

20

15. An article as claimed in any one of preceding claims, wherein said first layer comprises a sheet or membrane that is permeable to water vapour and resistant to the permeation of liquid water, said sheet or membrane being
25 elastically deformable in a direction parallel to the plane of the sheet to at least 300% of its resting dimension in said direction.

16. An article as claimed in claim 15, wherein the sheet
30 or membrane is elastically deformable in a direction parallel to the plane of the sheet to at least 500% of its resting dimension in said direction.

17. An article as claimed in claim 16, wherein the sheet or membrane is elastically deformable in a direction parallel to the plane of the sheet to at least 1000% of its resting dimension in said direction.

18. An article as claimed in any one of the preceding claims, wherein said first layer comprises a sheet or membrane that is permeable to water vapour and resistant to the permeation of liquid water and the sheet or membrane has a tear propagation of at least 50 N/mm.

19. An article as claimed in claim 18, wherein the sheet or membrane has a tear propagation of at least 100 N/mm.

20. An article as claimed in claim 19, wherein the sheet or membrane has a tear propagation of at least 125 N/mm.

21. An article as claimed in any one of the preceding claims, wherein the one or more sanitary agents are selected from an anti-microbial agent, deodorising agent or anti-perspirant agent.

22. An article as claimed in claim 21, wherein the anti-microbial agent is selected from an anti-bacterial or an anti-fungal agent.

23. An article as claimed in claim 22, wherein the anti-microbial agent is selected from thiocarbamates, thiocyanates, isothiocyanates, dithiocarbamates, quaternary ammonium compounds, amides, triazines, guandidines, silver-containing compounds, tin-containing compounds or copper-containing compounds.

24. An article as claimed in claim 23, wherein the anti-microbial agent is 2,4,4'-trichloro-2-hydroxydiphenyl ether.

5

25. An article as claimed in claim 22, wherein the deodorising agent is selected from activated carbon, zeolites, silicon, metal oxides of titanium (TiO₂), zinc (ZnO) and aluminium, ceramics and ceramic-coated sheath
10 fibres.

26. An article as claimed in any one of the preceding claims, wherein the second layer comprises a non-woven textile material or sheet.

15

27. An article as claimed in any one of the preceding claims, wherein the second layer comprises nylon, polypropylene, polyester, viscose or a mixture thereof.

20 28. An article as claimed in claim 27, wherein the second layer comprises a sheet comprising a mixture of polyester and viscose, wherein said polyester to viscose ratio is, by weight, 30:70 to 70:30.

25 29. An article as claimed in any one of the preceding claims, wherein said second layer has a weight of from 12 to 35 gsm.

30 30. An article as claimed in any one of the preceding claims, wherein an absorbent is disposed between the first and second layers.

31. An article as claimed in claim 30, wherein said absorbent forms a layer and said layer has a thickness of from 10 μ m to 1mm.

5 32. An article as claimed in any one of claims 29 to claim 31, wherein said absorbent comprises a cellulosic fibre, said cellulosic fibre being selected from cotton, viscose, woodpulp, or a mixture thereof.

10 33. An article as claimed in any one of the preceding claims, wherein one or more of said layers is/are adhered to one or more of the adjacent layers in the laminate.

34. An article as claimed in claim 33, wherein one or
15 more of said layers are adhered to one or more adjacent layers by means of liquid adhesives, flame lamination or powder adhesives, or a mixture thereof.

35. An article as claimed in claim 34, wherein the article
20 is selected from a shirt, T-shirt, pullover, male or female brief, bra, cardigan, skirt, dress, blouse, trousers, shorts, sock, tie, pair of jeans, glove, coat, jacket, boxing glove, mitt, hats, caps, skull caps, helmets.

25 36. An article as claimed in any one of claims 1 to 34, wherein the article is an item of footwear.

37. An article as claimed in claim 36, wherein the
30 footwear is selected from shoes, boots, slippers, sandals, sports shoes or trainers.

38. An article as claimed in any one of the preceding claims, wherein the fabric layer comprises a textile material having a knitted, woven or non-woven structure.

5 39. An article as claimed in any one of the preceding claims, wherein said fabric layer comprises one or more of polyester, polyamides, polyvinyl alcohols, lyocell, rayon, viscose, nylon, cotton, linen, flax, hemp, jute and wool.

10 40. An article for covering a piece of furniture, said article comprising a laminate which includes the following layers:

a fabric layer, at least part of which is permeable to water vapour and liquid water,

15 a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and

a second layer, at least part of which contains one or more sanitary agents, and

20 optionally, an absorbent,

wherein said second layer is interposed between said fabric layer and said first layer, said absorbent, if present, is located between said first layer and said second layer and said fabric layer which is permeable to
25 water vapour is, in use, the closest of said layers towards the exterior of said piece of furniture.

41. An article as claimed in claim 40, wherein one or more of said layers is/are adhered to one or more of the
30 adjacent layers in the laminate.

42. An article as claimed in claim 41, wherein said covering is an article of bed linen.

43. An article as claimed in claim 42, wherein said article of bed linen is selected from a pillow case, a quilt cover or a laminate bed sheet.

5

44. An article of furniture comprising a covering as claimed in claim 40 or claim 44.

45. An article of furniture comprising a covering as claimed in claim 44, said article of furniture being selected from a chair, sofa, wheelchair, car seat, mattress or stool seat.

46. An article for covering a handle-grip, said article comprising a laminate which includes the following layers:

a first layer, at least part of which is permeable to water vapour and resistant to the permeation of liquid water, and

a second layer, at least part of which contains one or more sanitary agents, and

wherein said second layer, in use, is the closest of said first and second layers towards the exterior of said handle-grip.

47. An article as claimed in claim 46, wherein said laminate further comprises an absorbent and said absorbent is located between said first layer and said second layer.

48. A handle-grip comprising an article as claimed in claims 46 or claim 47.

49. A receptacle, said receptacle comprising a laminate which includes the following layers:

a fabric layer, at least part of which is permeable to water vapour and liquid water,

a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water,
5 and

a second layer, at least part of which contains one or more sanitary agents, and

optionally, an absorbent,

wherein said second layer is interposed between said
10 fabric layer and said first layer, said absorbent, if present, is located between said first layer and said second layer.

50. A receptacle as claimed in claim 49, wherein said
15 fabric layer is the closest of said layers to the exterior of the receptacle.

51. A receptacle as claimed in claim 50, wherein said receptacle is selected from a rucksack, a holdall, a
20 suitcase, handbag, shoulder bag, purse, wallet, beach bag or sports bag.

52. A receptacle as claimed in claim 51, wherein said fabric layer is closest of said layers in the laminate to
25 the interior of said receptacle.

53. A receptacle as claimed in claim 52, wherein said receptacle is a sleeping bag.

30 54. A method of manufacturing an article of clothing comprising an outer fabric permeable to water vapour, said method comprising:

providing a fabric which will form the outer fabric of the article of clothing,

providing a first layer of material that is permeable to water vapour and resistant to the permeation of liquid
5 water,

providing a second layer of material comprising one or more sanitary agents, and

adhering said first layer of material to at least part of one side of the fabric intended to form the outer
10 fabric, said one side intended to be the interior side of the article of clothing,

adhering said second layer of material to at least part of one side of the first layer, said one side of the first layer intended to be towards the interior side of
15 the article of clothing, and

forming said fabric into the article of clothing, said first layer being on the interior side of the outer fabric in the article of clothing.

20 55. A method of manufacturing an article of clothing comprising an outer fabric, said method comprising:

providing a fabric which will form the outer fabric of the article of clothing,

providing a first layer of material that is permeable
25 to water vapour and resistant to permeation of liquid water,

providing a second layer of material comprising one or more sanitary agents, and

providing an absorbent layer of material,
30 adhering said first layer of material to at least part of one side of the outer fabric, said one side intended to be the interior side of the article of clothing,

adhering said absorbent layer of material to the side
of first layer of material not adhered to the outer fabric
and

adhering said second layer of material to the side
5 of absorbent layer of material not adhered to the first
layer of fabric and

forming said fabric into the article of clothing, said
first layer being on the interior side of the out fabric
in the article of clothing.

10

56. A method as claimed in claim 54 or 55, wherein each
layer is adhered to one or more adjacent layers using any
one of liquid adhesives, flame lamination or powder
adhesive.

15

57. A method as claimed in claim 56, wherein said adhesive
is distributed in spot locations on each layer and is not
uniformly distributed over each layer.

20 58. Use of a laminate structure in an article of clothing
to prevent or mitigate the visibility, from the exterior
of the clothing, of a wearer's perspiration in the region
of said laminate, and allow transmission of said water
from said perspiration through the clothing, wherein said
25 laminate includes the following layers:

a fabric layer, at least part of which is permeable to
water vapour, said fabric layer being optionally the
exterior layer of said article of clothing,

a first layer disposed, in use, on at least part of
30 the interior side of said fabric layer wherein, said first
layer is permeable to water vapour and resistant to the
permeation of liquid water, and said first layer comprises
or consists of an unpigmented translucent membrane or

sheet that has a thickness of from 5 μ m to 20 μ m and a weight of from 11 to 17 gsm and

wherein said laminate further comprises a wicking layer disposed, in use, on the interior side of said first layer, and said wicking layer comprising polyester, viscose or a mixture thereof.

59. An article for covering or incorporation into a floor, wall or ceiling, said article comprising a laminate which includes the following layers:

a fabric layer, at least part of which is permeable to water vapour,

a first layer, at least part of which is permeable to water vapour and resistant to permeation of liquid water, and

a second layer, at least part of which contains one or more sanitary agents, and

optionally, an absorbent, wherein said second layer is interposed between said fabric layer and said first layer, said absorbent, if present, is located between said first layer and said second layer.

60. An article as claimed in claim 59, wherein said article is selected from a rug, a carpet, bath mat, wall paper, tiles, floor board, structural members of a wall, floor or ceiling, the fabric roof of a cabriolet car.

61. An article for covering piping, said article comprising a laminate which includes the following layers:

a fabric layer at least part of which is permeable to water vapour,

a first layer, at least part of which is permeable to water vapour and resistant to the permeation of liquid water, and

a second layer, at least part of which contains one or
5 more sanitary agents.

wherein said second layer, in use, is the closest of said first and second layers towards the piping, and

said first layer is interposed between said fabric layer and said second layer.

10

62. An article for making clothing comprising a laminate as defined in any one of claims 1 to 38.

15

63. An laminated article comprising a laminate as claimed in any one of the preceding claims.

64. An laminated article as claimed in claim 63, wherein said article is for industrial use.

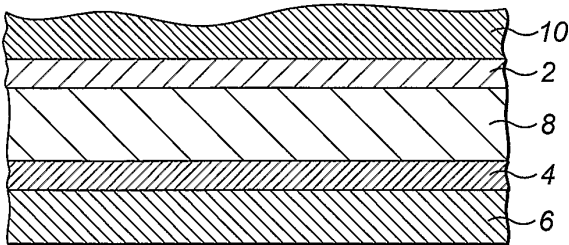


FIG. 1

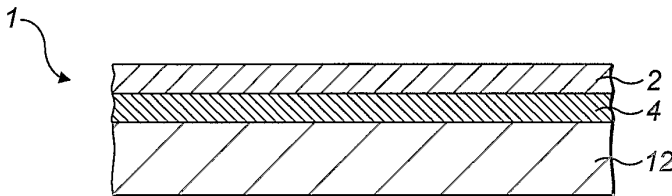


FIG. 2



FIG. 3

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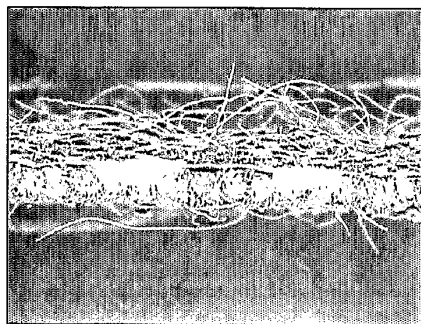


FIG. 4a

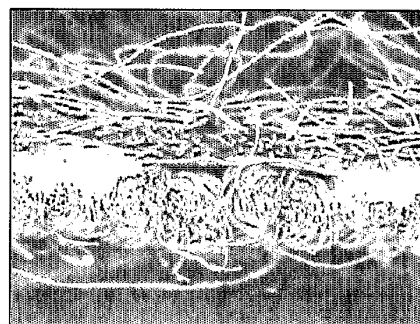


FIG. 4b

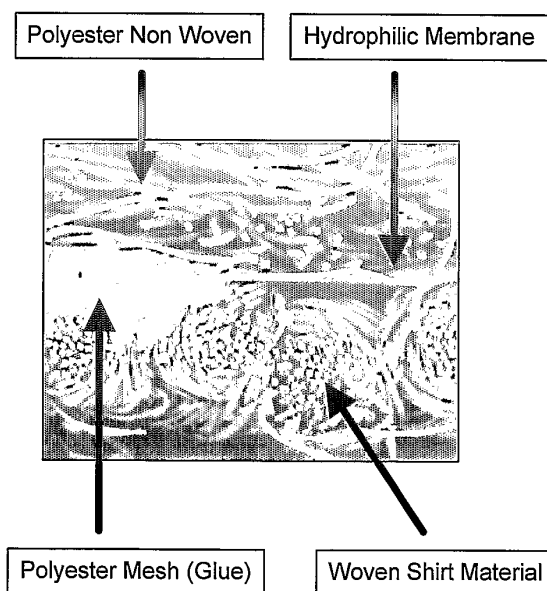


FIG. 4c



FIG. 4d

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