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(54) **Garment treatment device and method for treatment garments**

(57) The invention relates to a Garment treatment device (2, 2a) for treating a garment, in particular for re-freshing a garment, comprising a supporting means (4, 6) for supporting a garment to be treated, and at least

one supply unit (8, 10) arranged at or in the supporting means (4, 6) and adapted to supply at least one treatment agent to a garment to be treated, wherein the at least one treatment agent is fog, mist, aerosol and/or steam.

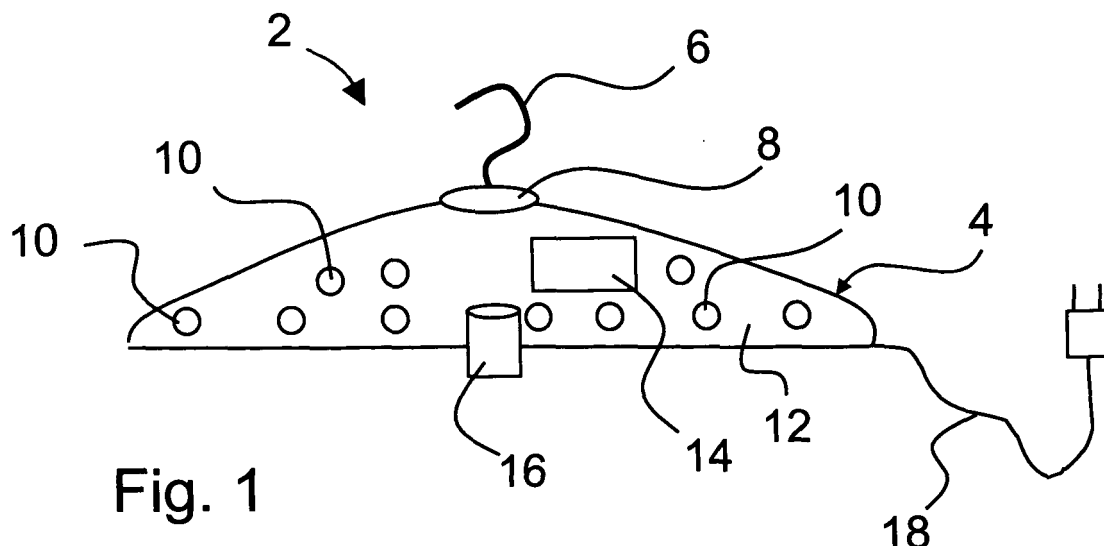


Fig. 1

Description

[0001] The present invention relates to a garment treatment device and a method for treating garments, in particular for refreshing garments.

[0002] EP 1 441 060 A1 discloses a dryer for treating, e.g. refreshing, clothes by injecting additives like a cleaning detergent, a fragrance or a disinfectant into the drum. For energy-efficient operation of the dryer a certain minimum load of clothes has to be provided to the drum.

[0003] It is an object of the invention to provide a garment treatment device and method for treating garments which provides easy and flexible treatment of a garment.

[0004] The invention is defined in claims 1 and 27, respectively.

[0005] Particular embodiments are set out in the dependent claims.

[0006] According to claim 1, a garment treatment device for treating, e.g. refreshing or dry cleaning, garments is provided. The term garment means a single or individual pieces of laundry or textile, e.g. shirts, t-shirts, trousers and the like. The device comprises a supporting means for supporting a garment to be treated, e.g. in shape of a clothes hanger, a clothes valet or a clothes stand. Further the device comprises at least one supply unit which is arranged at or in the supporting means. The supply unit is adapted to supply at least one treatment agent to a garment to be treated. Preferably the treatment agent is one of fog, mist, aerosol and steam, in particular hot steam, or a combination thereof.

[0007] Preferably the at least one treatment agent is provided as a droplet-free steam or fog. This is particularly advantageous as the supply of droplets to a garment could cause wet "spots" on the garment which could possibly damage to the fabric, e.g. if the garment is only suitable for dry cleaning.

[0008] Preferably the supporting means comprises a supporting body for supporting a garment to be treated, including a supporting surface which is in touch with a garment to be treated like an upper surface of a clothes hanger in touch with e.g. a shirt hung on the hanger. At least a portion of the supporting body, in particular at least a portion of the supporting surface, is permeable for the at least one treatment agent, i.e. the treatment agent can pass at least partially through the supporting body. This can be accomplished by a membrane permeable for steam, for example. Particularly advantageous is a membrane which is permeable for steam and impermeable for liquid. Thereby the part of the garment in contact with the permeable material, i.e. the supporting surface, is only subject to steam treatment and liquid, like condensed water, is kept away from this part of the garment. Therefore a wetting or an excessive wetting of the part of the garment in contact with the supporting surface is prevented. Whereby again a possible damaging of a fabric due to (over-)wetting is prevented.

[0009] Alternatively or additionally at least a portion of the supporting body, in particular the supporting surface,

comprises at least one opening, preferably a plurality of openings to allow the treatment agent to pass through the supporting body. For example the supporting body can comprise a grid or a perforated plate. Preferably a grid-like supporting body is combined with a permeable membrane or material as described above.

[0010] According to a preferred embodiment the supporting means is at least partially inflatable, deflatable and/or foldable. Thereby the size of the supporting means, i.e. of the device, can be reduced when the device has to be stored, e.g. when not in use or when being transported. For example the supporting means can comprise one or several portions which can be inflated by a pump, a fan or by blowing-up of the supporting means by a user himself. Preferably a foldable supporting means is build similar to an umbrella which can be folded up to a minimum size for travelling transport or storage.

[0011] In use the device is preferably arranged completely inside or substantially inside a garment to be treated. For example a hanger-shaped device is substantially inside a garment or in other words the garment to be treated is arranged on the outside of the device and the garment covers or substantially covers the device.

[0012] Preferably the device is portable or is a handheld device, that is the device has a size and weight convenient for a user to be carried or taken to various places, providing easy and quick garment treatment almost everywhere. For example the device can easily be packed for traveling, whereby a user is able to refresh his garments comfortably and quickly while being away from home. The device is ideally a travel equipment or can be used as such.

[0013] According to a preferred embodiment the at least one supply unit is adapted to supply a treatment agent continuously to a garment to be treated. By the continuous supply of the agent, the amount of agent necessary for treating the garment is supplied in a short time, thereby providing a quick treatment of the garment. Preferably the treatment agent is supplied intermittently, for example a treatment agent is supplied at the beginning and - after a certain acting time of the agent on the garment - the same or another treatment agent is supplied. According to another preferred embodiment a treatment agent is supplied periodically, e.g. repeatedly or intermittently the agent is supplied in periodical intervals to a garment.

[0014] Preferably the supply unit comprises at least one nozzle to supply the at least one treatment agent to a garment to be treated. More preferably a nozzle arrangement having a plurality of nozzles is provided, wherein the nozzles are arranged to distribute the treatment agent throughout or across a garment to be treated. In particular, when the garment arranged on a device extends beyond the device the nozzle or nozzles distribute or direct the at least one treatment agent in a direction to provide also treatment of the part of the garment which extends beyond or is farther away from the device's outer limits. For example the nozzle or nozzle arrangement

directs a flow of a treatment agent to the sleeves or the lower part of a shirt hanging over a hanger-shaped device, i.e. the flow is at least partially directed to the sleeves or the lower part of the shirt. Thereby the garment is evenly treated, also the parts of the garment which are not in proximity of the device or the at least one nozzle. According to another embodiment the providing of at least two or a plurality of supply units provides a distribution of a treatment agent to the different parts of a garment (e.g. sleeves), preferably the supply unit(s) are arranged on the device to meet the specific distribution requirements of a garment, for example for trousers (two legs) and shirts (two sleeves and chest portion). In an embodiment one or a plurality of supply unit can be attached to a treatment device at various positions.

[0015] Preferably the orientation of the at least one nozzle or the nozzles of the nozzle arrangement is adjustable, that is the flow direction of the agent provided by the nozzle can be adjusted to the particular shape of a garment to be treated or to the particular parts of a garment which require treatment.

[0016] Preferably the above mentioned blowing means are adapted to distribute a treatment agent in a garment, alternatively or additionally an air circulation means is adapted to distribute a treatment agent in a garment.

[0017] According to a preferred embodiment the device comprises at least one storage means for storing a starting or precursor material of the at least one treatment agent. A starting material or precursor material is for example a treatment fluid which has to be atomized or vaporized to form the treatment agent which is then supplied to the garment to be treated. The starting material can be either gaseous, liquid or solid, whereby a gas- or air-borne-phase of the treatment agent is provided either by sublimation of a solid starting material or by atomizing or vaporizing of a liquid starting material. When for example liquid water is provided as a starting material in the storage means, it can be atomized, nebulized or sprayed to provide a fine mist or fog, or it can be heated to provide hot water steam. Preferably the storage means, like a reservoir, container or tank, is fixed to the device, providing a compact build-up of the device.

[0018] According to another preferred embodiment an external storage means is provided, which is connected to the supply unit via a supply line. The supply line can be connected permanently or detachably to an external storage means, e.g. to a water-tap or an external container, like a bucket, bottle or tank containing a starting or precursor material.

[0019] Preferably the at least one starting or precursor material is selected from pure water, a mixture comprising water, a perfume, a disinfectant, an impregnant, a softener, or a combination thereof. According to a preferred embodiment the only starting material used is pure water or a mixture substantially composed of water.

[0020] According to a preferred embodiment the device comprises a heating element. For example the at

least one starting or precursor material can be heated, in particular a fluid starting material like a mixture mainly comprising water can thereby be vaporized to provide steam as a treatment agent. Also a treatment agent already being in gas-phase or air-borne can be heated, whereby the agent is activated or provided with higher activity, e.g. a disinfectant. Further, the surrounding air can be heated or in particular the air flow provided by the above mentioned blowing means or air circulating means, whereby a drying of a wet or damp garment can be accomplished.

[0021] Preferably the device comprises a fixing means to fix the device to a holding element. The fixing means can be a hook for detachably fixing the device for example to a clothes rail. Another possibility is at least one magnetic element to fix the device to a magnetic surface or to provide a hook-and-loop fastener. According to another preferred embodiment the device is permanently attached to a surface, e.g. by providing a fixing means which can be screwed to a wall or ceiling.

[0022] According to a particularly preferred embodiment the device comprises an internal energy source for powering at least the at least one supply unit, preferably the energy source is fixed to the device. Thereby the device can be used in various places, also when no electricity network is available. Preferably the energy source comprises at least one accumulator, battery, fuel cell or solar cells or a combination thereof. Additionally or alternatively the device comprises a power supply line connectable to an external energy source like an electricity network.

[0023] According to claim 21 a method is provided for treating a garment, in particular for a garment treatment device as described above. A garment to be treated is arranged at or on a garment treatment device, e.g. when the device is hanger-type a shirt is hung over the device. Then at least one supply unit is activated to supply at least one treatment agent to a garment to be treated, preferably according to any of the above described embodiments. The at least one treatment agent is not purely air, but mist, fog, aerosol or steam or a combination thereof.

[0024] The supply of the at least one treatment agent to the fabric of the garment, e.g. steam, reduces or removes wrinkles or creases from the garment, thereby refreshing the garment. Also a supply of a treatment agent like a perfume or disinfectant or softener provides a refreshment of the garment. An easy and quick refreshment of a garment is therefore provided by the above method.

[0025] Preferably the device is fixed to a holding element by fixing means before a garment is arranged on the device. Thereby a user has his or her hands free to arrange a garment on the device. Also a fixing of the device to a holding element after the arranging of a garment is possible, e.g. first hanging a shirt on a hanger-shaped device and then hanging up the device to a clothes rail.

[0026] Preferably at least a portion of the device is inflated and additionally or alternatively folded-out before arranging the garment on the device. Whereby the inflating or folding-out provides a support body, i.e. a supporting surface, for a garment to be arranged on the device. Alternatively at least a portion of the device is inflated or folded-out after the arranging of a garment on the device. When a garment is arranged on a device, i.e. the garment substantially covers the device, and further the device has a size or shape that is similar to the garment to be treated this alternative is advantageous as it is easier to arrange the garment on the device when the device is smaller due to its deflated or folded state.

[0027] Preferably the at least one treatment agent is supplied continuously, intermittently or periodically as described above. According to preferred embodiment at least two treatment agents are supplied to a garment to be treated. In particular the at least two treatment agents are supplied concurrently, that is at the same time. This can be accomplished by mixing the at least two agents before they are supplied by at least one supply unit or by supplying the at least two agents simultaneously, each agent by a separate supply units. The simultaneous supply can also be continuously, intermittently or periodically.

[0028] Preferably the at least two treatment agents are supplied alternately, that is one after the other. The agents can be supplied periodically, i.e. each treatment agent is in turn supplied for specific period, wherein periods of no supply or supply pauses can be included. Preferably one treatment agent is supplied primarily during a treatment of a garment, e.g. water steam, and another treatment agent is supplied at the end of a treatment, e.g. perfume. Wherein "treatment" means the overall treatment duration, possibly comprising several treatment agent supply periods as described above.

[0029] According to another preferred embodiment at least one treatment agent is supplied continuously and at least a second agent is supplied periodically or intermittently.

[0030] Reference is made in detail to preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings which show:

- Fig. 1 a side view of a garment treatment device,
- Fig. 2A a sectional side view of a garment treatment device according to another embodiment, and
- Fig. 2B a top view of the garment treatment device of Fig. 2A,
- Fig. 3 a schematic view of a further embodiment of a garment treatment device,
- Fig. 4 a schematic view of the garment treatment device of Fig. 1 arranged at a clothes hanger.

[0031] Fig. 1 shows a side view of a garment treatment hanger 2 according to a preferred embodiment of the invention. The device 2 is hanger-type and comprises a supporting body 4 on which a garment to be treated (not shown) is arranged when using the device 2. The device can be fixed or attached to a holding element like a clothes rail 30 via a hook 6 - see Fig. 4. The supporting body 4 comprises a tank 12 for storing a gaseous, a liquid, a fluid or a solid starting material for a treatment agent, preferably water. Further an atomizer 8, in particular an ultrasonic atomizer, is attached to the device 2 to atomize a starting material provided by the tank, i.e. the atomizer provides a treatment agent for a garment to be treated as a fine mist, fog or steam or a combination thereof. For powering the atomizer 8 an accumulator 14 is attached to the device 2. Additionally a power supply line 18 - connectable to an external energy source - is attached to the device 2 powering the atomizer 8. Further the device comprises a heating element (not shown) to heat a starting material, a treatment agent or surrounding air, in particular in use with an external power source, like power from a power socket 28.

[0032] The device comprises a plurality of nozzles 10 arranged at the supporting body 4. Via the nozzles 10 at least one treatment agent is provided to a garment hanging on the device 2. When a shirt is treated a treatment agent is directed via the nozzles 10 to the lower parts and into the sleeves of the shirt which are farther away from the device than the shoulder part of the shirt which is in contact with the device 2. Thereby it is provided that the treatment agent is applied throughout or across the garment, even to parts of the garment which are not in the proximity of the device 2 or the nozzles 10.

[0033] For supplemental treatment the device 2 comprises a perfume cartridge 16 which is connected to the atomizer 8 to distribute the perfume via the nozzles 10. Alternatively the perfume in the perfume cartridge 16 which is provided as vapour to be distributed together with the flow of the treatment agent by the nozzles 10.

[0034] An exemplary method for treating a garment is explained in the following. Inflatable parts of the hanger 2 are inflated to provide the hanger-shape for the supporting body 4. Thereby the supporting body 4 provides a supporting surface for a garment. The tank 12 is filled with water and a perfume cartridge is attached to the hanger 2. A shirt (not shown) is arranged at the hanger, that is the shirt is hung over the hanger 2. Due to the supporting body 4 the shirt hangs loose and without creases on the hanger 2. The hanger 2 is fixed to a clothes rail via the hook 6 - see Fig. 4 - and the nozzles 10 of the nozzle arrangement are directed to lower parts of the shirt. Then the hanger 2 is connected via the power supply line 18 to a power socket 28 to provide energy for the heating element and the atomizer 8. Then the atomizer 8 and the heating element are activated and water from the tank 12 is supplied to the shirt via the nozzles 10 as vapour or steam. At the end of the supply of steam, perfume from the cartridge 16 is supplied to the shirt via the

atomizer 8. The steam supplied to the shirt removes creases and undesired odours from the shirt and the subsequent perfume supply provides the shirt with a desired fragrance. After the treatment the shirt is ready for use. However, the shirt can also be left on the hanger 2 for later use. In case the hanger 2 is not required, inflatable parts of the hanger 2 are deflated to provide a hanger 2 which requires little transport volume or storing volume.

[0035] Fig. 2A shows a sectional side view of a second embodiment of a garment treatment device 2a according to the invention. Elements of this embodiment equal to elements of Fig. 1 are marked by the same reference numerals. The device 2a comprises a grid-like body (see top view of Fig. 2B) having a plurality of crossing bars 26, forming a plurality of openings 22. Thereby the treatment agent can pass through the supporting body 4 to evenly treat parts of a garment in contact with the supporting body 4. In particular for treating a garment like a shirts the bars 26 or the supporting body 4 extend side-ways to provide support for the sleeves of a shirt. Thereby it is provided that the treatment agent is supplied to the interior of the sleeves to provide a substantially uniform distribution of the agent throughout the shirt.

[0036] Nozzles 10 are arranged at positions to direct a treatment agent into various directions depending on the shape of a garment to be treated, wherein preferably the orientation of a nozzle 10, i.e. the orientation of a flow of the treatment agent, can be adjusted depending on the specific shape and position of a garment to be treated.

[0037] Fig. 2B shows a top view of the device 2a of Fig. 2A. The grid 24 formed by the bars 26 has a three-dimensional shape resembling the shape of shoulders to provide that a garment, e.g. shirt, to be treated is evenly supported. That is a garment can be arranged at or on the device 2a without folds e.g. in the shoulder area of a shirt. Further the shape of the grid 24 provides that a garment to be treated, e.g. a shirt, is spread out and hangs loose over the device.

[0038] To provide an even or smooth supporting surface of the supporting body 4 or the supporting body 4, i.e. the grid 24, is covered by a permeable material (not shown), like a permeable membrane. From the inside of the device 2a to the outside, that is from an inner side of the device 2a to the outside where a garment is arranged, the permeable material is permeable for a treatment agent like steam but not permeable for liquid, e.g. water droplets. Thereby a wetting or excessive wetting of a garment is prevented, in particular in the area where the garment is in' contact or in close proximity to the supporting body 4, like the shoulder area of a shirt.

[0039] The size of the device 2a can be reduced by folding-up the grid 24 using hinges (not shown) or alternatively by providing plug-and-socket connections between the bars 26, which can be easily disassembled. When using a grid 24 together with a permeable material 20 on the grid 24 it is particularly advantageous to provide a folding mechanism similar to the one of an umbrella.

[0040] It is particularly advantageous that the device

2a has a size, weight and shape to be easily transported or packed e.g. in a suitcase for traveling, whereby an easy-to-use and quick garment treatment and refreshment is provided for a user in various locations during traveling.

[0041] Fig. 3 shows another embodiment of a treatment hanger 2b having a fixing element or holder 20 for permanent fixing to a wall 21, e.g. in the home area. Thereby a quick and easy refreshment for single garment in the home area is permanently provided. Via a power socket 28 the atomizer 8 and an optional heating element is powered.

Reference Numerals List

[0042]

2, 2a, 2b	treatment hanger
4	supporting body
6	hook
8	atomizer
10	nozzle
12	tank
14	accumulator
16	perfume cartridge
18	power supply line
20	holder
21	wall
22	opening
24	grid
26	bar
28	power socket
30	clothes rail

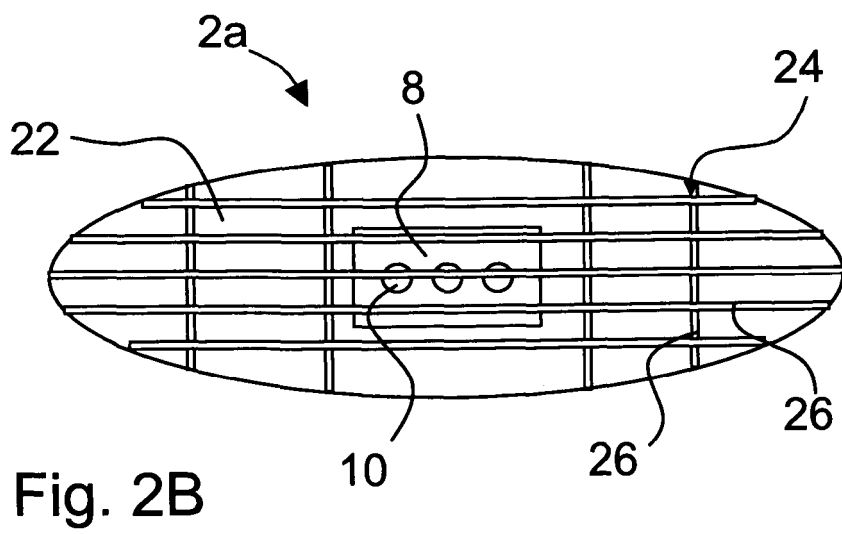
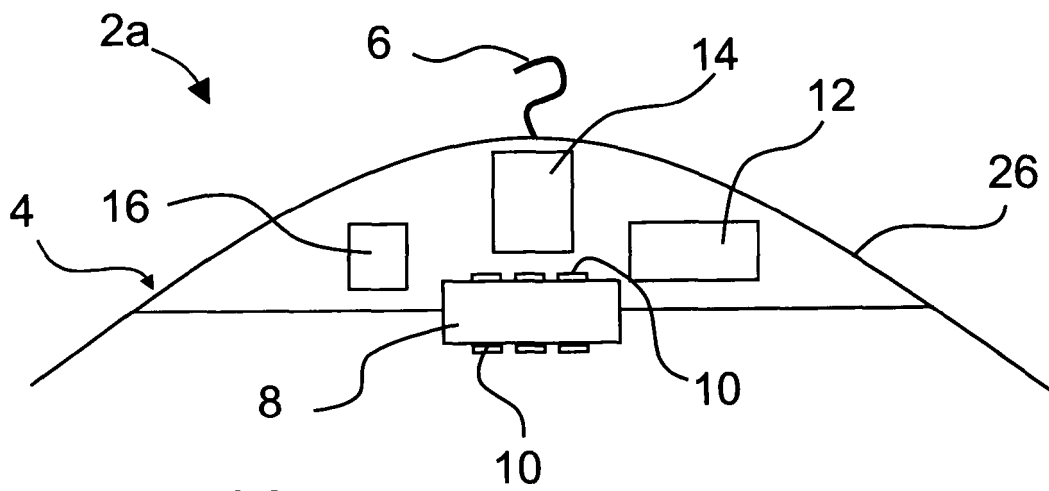
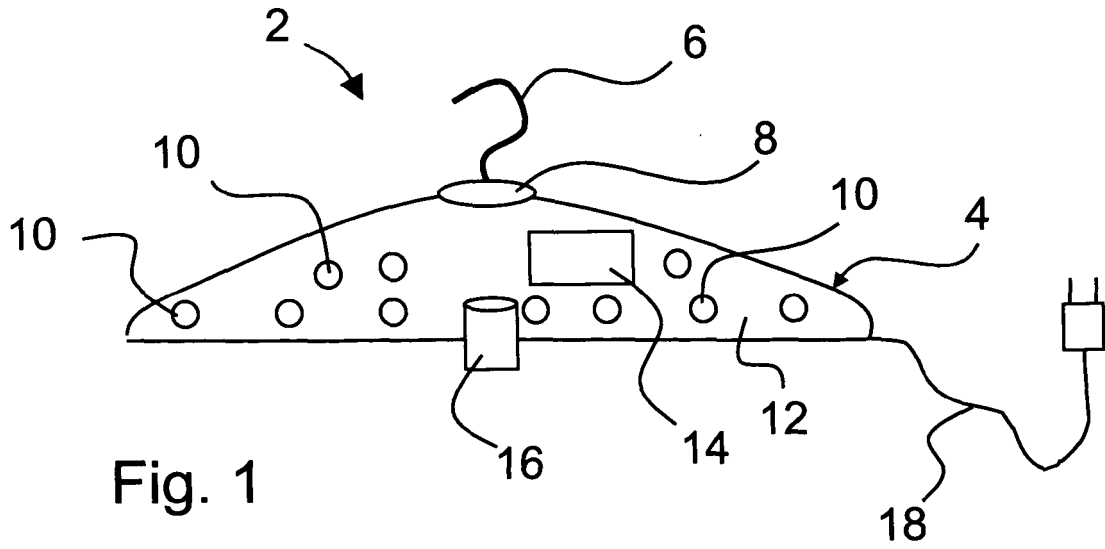
Claims

1. Garment treatment device (2, 2a) for treating a garment, in particular for refreshing a garment, comprising a supporting means (4, 6) for supporting a garment to be treated, and at least one supply unit (8, 10) arranged at or in the supporting means (4, 6) and adapted to supply at least one treatment agent to a garment to be treated, wherein the at least one treatment agent is fog, mist, aerosol and/or steam.
2. Device according to claim 1, wherein the supporting means (4, 6) comprises a supporting body (4) for supporting a garment to be treated.
3. Device according to claim 2, wherein at least a portion of the supporting body (4) is permeable for the at least one treatment agent and/or at least a portion of the supporting body (4) comprises at least one opening (22), in particular a plurality of openings.

4. Device according to claim 1, 2 or 3, wherein the device (2, 2a), in particular the supporting means (4, 6), is hanger-type and/or hanger-shaped.
5. Device according to any of the previous claims, wherein the supporting means (4, 6) is at least partially inflatable, deflatable and/or foldable.
6. Device according to any of the previous claims, wherein in use the device (2, 2a) is arranged inside or substantially inside a garment to be treated.
7. Device according to any of the previous claims, wherein the device (2, 2a) is portable, in particular a hand-portable device.
8. Device according to any of the previous claims, wherein the device (2, 2a) comprises an air blowing means, in particular a fan or a pump for inflating the at least partially inflatable supporting means, and/or an air circulating means.
9. Device according to any of the previous claims, wherein the at least one supply unit (8, 10) is adapted to supply the at least one treatment agent continuously, intermittently and/or periodically to a garment to be treated.
10. Device according to any of the previous claims, wherein the at least one supply unit is adapted to supply the at least one treatment agent as a droplet-free steam.
11. Device according to any of the previous claims, wherein the at least one supply unit (8, 10) comprises at least one atomizer means (8), in particular an ultrasonic atomizer means.
12. Device according to any of the previous claims, wherein the at least one supply unit (8, 10) comprises at least one nozzle (10), in particular a nozzle arrangement having a plurality of nozzles.
13. Device according to any of the previous claims, wherein a nozzle arrangement of the at least one supply unit (8, 10) is adapted to distribute the at least one treatment agent in a garment to be treated.
14. Device according to any of the previous claims, wherein the supporting means (4, 6) comprises at least one storage means (12, 16) for storing at least one starting or precursor material for the at least one treatment agent.
15. Device according to any of the previous claims, wherein at least one external storage means for storing at least one starting or precursor material for the at least one treatment agent is connectable or connected to the at least one supply unit via a supply line.
16. Device according to claim 14 or 15, wherein the at least one storage means and/or at least one external storage means comprises a tank, in particular a water tank.
17. Device according to claim 14, 15 or 16, wherein the at least one storage means and/or at least one external storage means comprises a cartridge, in particular a perfume cartridge.
18. Device according to any of the previous claims, wherein at least one starting or precursor material for the at least one treatment agent comprises a gas, a liquid and/or a solid.
19. Device according to any of the previous claims, wherein at least one starting or precursor material for the at least one treatment agent comprises pure water, a mixture comprising water, a perfume, a disinfectant, an impregnant and/or a softener.
20. Device according to any of the previous claims, wherein water or a mixture comprising more than 90% by weight of water, preferably more than 95%, is the only starting or precursor material for the at least one treatment agent.
21. Device according to any of the previous claims, wherein the device (2, 2a) comprises a heating element for heating the at least one starting or precursor material, the at least one treatment agent and/or the surrounding air, in particular air blown by the blowing means and/or air circulating means.
22. Device according to any of the previous claims, wherein the device (2, 2a) comprises fixing means (6, 20) designed to fix the device to a holding element, in particular to a clothes rail (30).
23. Device according to claim 22, wherein the fixing means comprise at least one hook, at least one magnetic element and/or at least one hook-and-loop fastener.
24. Device according to any of the previous claims, wherein the device (2, 2a) comprises a power supply line (18) connectable or connected to an external energy source at least for powering the supply unit (8, 10).
25. Device according to any of the previous claims, wherein the device (2, 2a) comprises an internal energy source (14) at least for powering the at least one supply unit (8, 10).
26. Device according to any of the previous claims,

wherein the internal energy source (14) is selected from at least one accumulator, at least one battery and/or at least one fuel cell.

27. Method for treating a garment, in particular for a garment treatment device according to any of claims 1 to 26, comprising the steps:
 - arranging a garment to be treated at or on a garment treatment device (2, 2a), 5
 - activating at least one supply unit (8, 10) arranged at or in the garment treatment device (2, 2a) to supply at least one treatment agent to a garment to be treated, wherein the at least one treatment agent is fog, mist, aerosol and/or steam. 10
28. Method according to claim 27, wherein before or after the arranging of a garment to be treated, the device is fixed to a holding element (30) by fixing means (6, 20). 15
29. Method according to claim 27 or 28, wherein before or after the arranging of a garment to be treated at least a portion of the device (2, 2a) is inflated and/or folded out to provide a supporting body (4) for a garment to be treated. 20
30. Method according to claim 27, 28 or 29, wherein the at least one treatment agent is supplied continuously, intermittently and/or periodically to a garment to be treated. 25
31. Method according to any of claims 27 to 30, wherein at least two treatment agents are supplied to a garment to be treated. 30
32. Method according to claim 31, wherein the at least two treatment agents are supplied concurrently and/or alternately to a garment to be treated. 35
33. Method according to any of claims 27 to 32, wherein at least one starting or precursor material of the at least one treatment agent is pure water, a mixture comprising water, a perfume, a disinfectant, an impregnant and/or a softener. 40
34. Method according any of claims 27 to 33, wherein water or a mixture comprising more than 90% by weight of water, preferably more than 95%, is the only starting or precursor material of the at least one treatment agent supplied to a garment to be treated. 45
35. Method any of the claims 27 to 34, wherein the at least one treatment agent is supplied as a droplet-free steam. 50



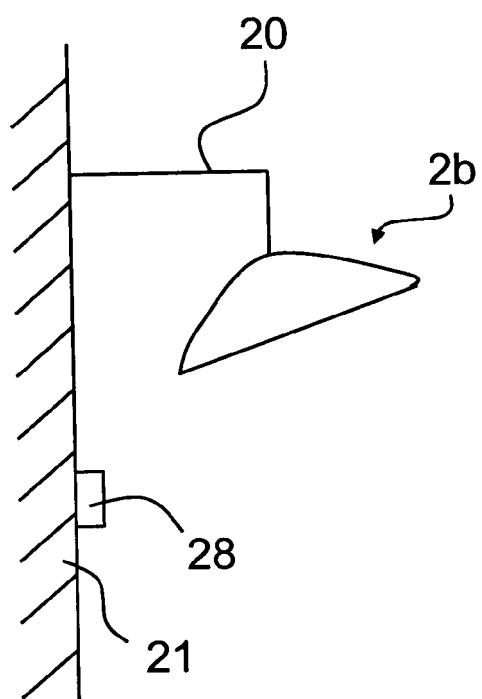


Fig. 3

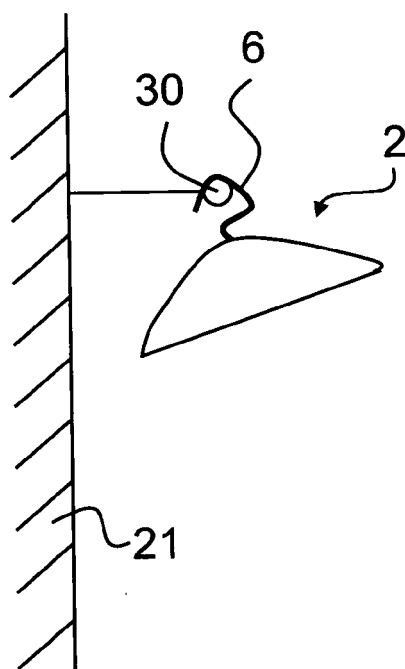


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 02 4038

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 687 278 A (TURNER FREDRICK C [US]) 11 November 1997 (1997-11-11) * the whole document * -----	1-10, 12-16, 18-25, 27-30, 33-35	INV. D06F73/00 D06F71/20 D06F59/02
X	DE 202 18 564 U1 (OESTERLEIN ANDREAS [DE]) 17 April 2003 (2003-04-17) * the whole document * -----	1-10, 12-16, 18-25, 27-30, 33-35	
X	EP 0 193 483 A (GOMEZ JACQUES) 3 September 1986 (1986-09-03) * page 3, line 20 - page 4, line 7; figure 1 *	1-10, 27-30	
X	FR 2 618 810 A (GOMEZ JACQUES [FR]) 3 February 1989 (1989-02-03) * the whole document * -----	1-10, 27-30	TECHNICAL FIELDS SEARCHED (IPC)
X	US 3 727 811 A (BUCKLEY N) 17 April 1973 (1973-04-17) * claims 1-3 *	1-5, 27-30	D06F
A	US 4 592 497 A (GEORGES FOURNIER [FR]) 3 June 1986 (1986-06-03) * the whole document *	1-35	
A	US 2006/261101 A1 (DAMRATH JOACHIM [DE] ET AL) 23 November 2006 (2006-11-23) * the whole document *	1-35	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 29 January 2008	Examiner Bichi, Marco
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 02 4038

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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