

Cooling Tool

Field

[0001]

The present invention relates to a cooling tool.

BACKGROUND

[0002]

Conventionally, there has been known a cooling tool capable of providing a cooling sensation and a refreshing sensation on at least eyes of a wearer. For example, Patent Literature 1 describes an eye mask provided with an impregnated cloth on a back surface of a mask main body. This impregnated cloth is impregnated with a cooling liquid obtained by dissolving menthol and a cooling agent in alcohols and an activator and diluted with purified water.

[0003]

The eye mask described in Patent Literature 1 is capable of providing a cooling sensation for the wearer by the impregnated cloth coming in contact with at least the eyes of the wearer, and the cooling liquid with which the impregnated cloth has been impregnated is capable of providing a refreshing sensation for the wearer.

Citation List

Patent Literature

[0004]

Patent Literature 1: Japanese Registered Utility Model No. 3049415

Summary of Invention

TECHNICAL PROBLEM

[0005]

However, the eye mask described in Patent Literature 1 has not examined a balance of the cooling sensation and the refreshing sensation provided for the wearer, and therefore, the wearer does not necessarily feel a comfortable coolness when the eye mask is worn, thereby leaving a room for improvement.

[0006]

The present invention relates to a cooling tool capable of providing a comfortable coolness for a wearer.

SOLUTION TO PROBLEM

[0007]

A cooling tool according to the present invention includes: a main body portion that covers at least eyes and/or areas around the eyes on a face of a wearer; and a cooling body disposed in the main body portion. The cooling body includes a water retention layer that retains water, the water retention layer has an initial content of the water of 0.04 g/cm^2 or more and 0.4 g/cm^2 or less, the cooling body is disposed in the main body portion such that at least a part of the cooling body comes directly or indirectly in contact with the eyes and/or the areas around the eyes of the wearer when worn, the cooling tool contains menthol, and a value obtained by multiplying the initial content of the water [g/cm^2] by an initial content of the menthol [mg/cm^2] and by 1000 is 4 or more and 40 or less.

ADVANTAGEOUS EFFECTS OF INVENTION

[0008]

The cooling tool of the present invention allows for providing a comfortable coolness for a wearer.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

FIG. 1 is a drawing illustrating a cooling tool according to an embodiment.

FIG. 2 is a schematic cross-sectional view of the cooling tool according to the embodiment.

FIG. 3 is a drawing illustrating the cooling body according to the embodiment.

FIG. 4 is a schematic cross-sectional view taken along the line II-II' in FIG. 3.

FIG. 5(a) is a drawing illustrating a state when the ear strap is stretched.

FIG. 5(b) is a drawing illustrating a state when the ear strap is worn.

FIG. 6 is a drawing illustrating a state where the cooling tool according to the embodiment is enclosed in a packaging body.

FIG. 7 is a schematic diagram illustrating a device that measures an amount of water vapor emission.

FIG. 8 is a schematic diagram illustrating a device that measures a volatilization volume of menthol.

DETAILED DESCRIPTION

[0010]

Hereinafter, a preferred embodiment for carrying out the

present invention will be described by referring to the drawings. Note that, the following embodiment does not limit the present invention according to each of the claims, and all combinations of the characteristics described in the embodiment are not necessarily essential for means for solving the problems of the present invention. In addition, in the embodiment, the scale and dimensions of each component may be exaggerated, or some components may be omitted.

[0011]

[Overall Configuration of Cooling Tool]

As illustrated in FIG. 1 and FIG. 2, a cooling tool 1 according to an embodiment includes a main body portion 10 that covers at least eyes and/or areas around the eyes on a face of a wearer, cooling bodies 20 disposed in the main body portion 10, and ear straps 30 disposed at two ends of the main body portion 10 in a width direction. This cooling tool 1 is perfumed with menthol. The cooling tool 1 according to the embodiment is stored in a state of being enclosed in a packaging body 200 having a waterproof performance (see FIG. 6). Note that FIG. 1 is a plan view in a state where the main body portion 10 is deployed such that a surface on a non-periocular side of the wearer (an outer surface) faces up.

[0012]

In the description, the "width direction" means a direction that corresponds to a direction in which a first panel portion 10A and a second panel portion 10B described later are aligned in a state where the main body portion 10 is viewed in a plane direction (the state in FIG. 1). In addition, "the two

ends of the main body portion 10 in the width direction" means an end portion on a side of the ear strap 30 of the first panel portion 10A and an end portion on a side of the ear strap 30 of the second panel portion 10B.

[0013]

[Configuration of Main Body Portion]

As illustrated in FIG. 2, the main body portion 10 includes an inner sheet 11 that faces a skin side of the wear (an upper side in FIG. 2) when the cooling tool 1 is worn, and an outer sheet 12 arranged so as to face the inner sheet 11 via the cooling bodies 20, and the main body portion 10 is formed into a sheet shape as a whole. The inner sheet 11 and the outer sheet 12 are formed to have the same shape and the same size, and are adhered to one another in a state where the cooling bodies 20 are arranged between the inner sheet 11 and the outer sheet 12. Note that, while this embodiment has described that the inner sheet 11 and the outer sheet 12 are formed to have the same shape and the same size, the configuration is not limited to this, and the inner sheet 11 and the outer sheet 12 may have different shapes, or may have different sizes.

[0014]

Here, a method for adhering the inner sheet 11 to the outer sheet 12 is described. In this embodiment, an adhesive agent (not illustrated) is applied on the outer sheet 12, and the cooling bodies 20 and the inner sheet 11 are adhered via the adhesive agent. For the adhesive agent, a hot-melt-type adhesive agent is preferably used, but the adhesive agent is not limited to this, and various known securing means are usable.

For example, adhesive agents other than those of a hot-melt-type, sewing, heat fusion, or the like are allowed, and as long as fixation is ensured, the adhesive agent is not limited.

[0015]

Note that, instead of or in addition to the configuration in which the adhesive agent is applied on the outer sheet 12, it is also allowed to employ a configuration in which the adhesive agent is applied on the inner sheet 11. The configuration is also allowed to form openings and housing spaces through which the cooling bodies 20 can be inserted and removed between the inner sheet 11 and the outer sheet 12 by leaving some local areas of the inner sheet 11 and the outer sheet 12 not adhered.

[0016]

[Material of Main Body Portion]

For materials of the inner sheet 11 and the outer sheet 12, those that have conventionally been used in the technical field of the cooling tool capable of covering at least the eyes and/or the areas around the eyes of the face of the wearer are usable. For example, a fiber sheet, such as a nonwoven fabric, a woven fabric, or a paper, a resin foam sheet, a metal sheet, or a combination thereof is used. Among all, a nonwoven fabric is preferred to be used from the aspect of workability and economic efficiency. For fiber materials of the nonwoven fabric, those constituted of one type or two or more types of fibers selected from, for example, a polyester, such as PET (polyethylene terephthalate); a polyolefin, such as PE (polyethylene), PP (polypropylene), or an ethylene propylene

copolymer; rayon; or cotton, are preferred. For the nonwoven fabric, those fabricated using the fibers of the above-described one type or two or more types of materials by an air-through method, spunbonding, needlepunching, a melt blown process, carding, heat fusion, hydroentangling, solvent bonding, or the like are usable, and may be a single-layer structure or a multi-layer structure. Note that the nonwoven fabric may undergo chemical processing corresponding to the object.

[0017]

Each of the inner sheet 11 and the outer sheet 12 may have a single-layer structure made of only one sheet material regardless of a single layer or a multilayer, or may have a multi-layer structure made by laminating two types or more sheet materials. Furthermore, the inner sheet 11 and the outer sheet 12 may have configurations having different constituent materials. Specifically, for the outer sheet 12 disposed on an outer side when worn, a constituent material appropriate for providing the shape retention performance for the cooling tool may be selected, or a constituent material appropriate for improving the texture of the outer surface may be selected. On the other hand, for the inner sheet 11 disposed inside when worn, a constituent material for the purpose of improvement of feel on the skin may be selected. The inner sheet 11 and the outer sheet 12 may be colored in any color, or may have any design (pattern) by printing or the like. Such configurations improve the texture and the taste, which allows for a cooling tool that matches the preference of a user.

[0018]

[Air permeability of Main Body Portion]

The inner sheet 11 has air permeability. Specifically, air permeability rate in at least a region between the eyes of the wearer and a water retention layer 22 of the inner sheet 11 is preferred to be 30000 seconds/100 mL or less, is more preferred to be 3000 seconds/100 mL or less, is more preferred to be 300 seconds/100 mL or less, is more preferred to be 200 seconds/100 mL or less, is further preferred to be 100 seconds/100 mL or less, is further more preferred to be 5 seconds/100 mL or less, and is the most preferred to be 0 seconds/100 mL from the aspect of accelerating evaporative heat dissipation caused by water evaporation. When such air permeability rate is satisfied, the configuration of the inner sheet 11 is allowed to have some portions without air permeability.

[0019]

Here, the air permeability rate is a value measured by Japanese Industrial Standard P8117 (version revised in 2009), and is defined as the time it takes for a 100 mL air to pass through an area of 6.42 cm² under a constant pressure. Accordingly, a large value of the air permeability rate means that it takes time for the air to pass through, that is, the air permeability is low. Conversely, a small value of the air permeability rate means that the air permeability is high. Thus, the magnitude of the value of the air permeability rate and the magnitude of the air permeability show an inverse relation. The air permeability rate is measurable using an Oken-type air

permeability tester. In the description, the air permeability rate less than 30000 seconds/100 mL is defined as "air permeable," the air permeability rate equal to or more than 30000 seconds/100 mL and less than 80000 seconds/100 mL is defined as "low-air permeability," and the air permeability rate equal to or more than 80000 seconds/100 mL is defined as "non-air permeability."

[0020]

The outer sheet 12 may have any of air permeability, low-air permeability, or non-air permeability. However, the outer sheet 12 is preferred to have low-air permeability or non-air permeability from the aspect of defining an evaporation release direction of the cooling bodies 20 on the side of the inner sheet 11 (the eye-facing side of the wearer).

[0021]

[Moisture Permeability of Main Body Portion]

The inner sheet 11 has a moisture permeability. Specifically, the inner sheet 11 has a moisture permeability in a region between at least the eyes of the wearer and the water retention layer 22 of preferably 12000 g/m²·24 hr or less, more preferably 11000 g/m²·24 hr or less, and further preferably 10000 g/m²·24 hr or less from the aspect of reducing stuffiness and wetness when worn. This moisture permeability is preferred to be 2000 g/m²·24 hr or more, is more preferred to be 2500 g/m²·24 hr or more, and is further preferred to be 3000 g/m²·24 hr or more from the aspect of enhancing a cooling effect by evaporative heat dissipation in association with water evaporation. When such moisture permeability is satisfied,

the configuration of the inner sheet 11 is allowed to have some portions without the moisture permeability.

[0022]

Here, the moisture permeability indicates the properties of passing water vapor through. The moisture permeability is a value measured by method A-1 of Japanese Industrial Standard L1099: 2012, and defines a water content that permeates per m^2 in 24 hours in a numerical value (g). Accordingly, a large value of the moisture permeability means high moisture permeability, and conversely, a small value of the moisture permeability means low-moisture permeability. In this description, the moisture permeability equal to or more than $100 \text{ g/m}^2 \cdot 24 \text{ hr}$ is defined to be "moisture permeable," the moisture permeability less than $100 \text{ g/m}^2 \cdot 24 \text{ hr}$ and equal to or more than $30 \text{ g/m}^2 \cdot 24 \text{ hr}$ is defined to be "low-moisture permeable," and the moisture permeability less than $30 \text{ g/m}^2 \cdot 24 \text{ hr}$ is defined to be "non-moisture permeable."

[0023]

Note that, in a sheet member, such as the inner sheet 11 or the outer sheet 12, when the sheet member has air permeability, the sheet member also has a moisture permeability.

[0024]

The outer sheet 12 may have any of moisture permeability, low-moisture permeability, or non-moisture permeability. However, the outer sheet 12 is preferred to have low-moisture permeability or non-moisture permeability from the aspect of defining an evaporation release direction of the cooling bodies 20 on the side of the inner sheet 11 (the eye-facing side of

the wearer).

[0025]

[Waterproof Performance of Main Body Portion]

The inner sheet 11 has a waterproof performance. Specifically, the inner sheet 11 has a water resistance level in at least the region between the eyes of the wearer and the water retention layer 22 of preferably 300 mm or more, more preferably 400 mm or more, and further preferably 500 mm or more from the aspect of avoiding to wet the eyes and/or the areas around the eyes of the wearer. Furthermore, it is the most preferred to be 1000 mm. When such a water resistance level is satisfied, the configuration of the inner sheet 11 is allowed to have some portions without the waterproof performance. While the inner sheet 11 has been described to have the waterproof performance, the configuration is not limited to this, and may have a non-waterproof performance (water permeability).

[0026]

Here, the waterproof performance indicates properties of avoiding water from permeating. The waterproof performance is evaluable with the water resistance level, and this water resistance level is measurable by method A of Japanese Industrial Standard L 1092. This water resistance level is defined as a height (mm) of a water column per cm^2 that withstands the water permeation. Accordingly, a large value of the water resistance level means a high waterproof performance, and conversely, a small value of the water resistance level means a low waterproof performance. In this description, a water

resistance level equal to or more than 300 mm is defined to be "waterproof," and a water resistance level less than 300 mm is defined to be "non-waterproof" or "water-permeable."

[0027]

The outer sheet 12 may have a waterproof performance, or may have a non-waterproof performance (water permeability).

[0028]

[Shape and the Like of Main Body Portion]

As illustrated in FIG. 1 and FIG. 2, the main body portion 10 has a vertical center line 100 that divides the main body portion 10 into two in the width direction, the first panel portion 10A that constitutes one side in the width direction bordered by the vertical center line 100, and the second panel portion 10B that constitutes the other side in the width direction bordered by the vertical center line 100.

[0029]

The vertical center line 100 is a line that extends in a direction perpendicular to the width direction in the center in the width direction of the main body portion 10 in a state where the main body portion 10 is deployed such that the surface of the non-periocular side of the wearer (an outer surface) faces up (the state in FIG. 1).

[0030]

The first panel portion 10A is constituted so as to cover one eye (for example, a right eye) of the wearer when the cooling tool 1 is worn. The second panel portion 10B is constituted so as to cover the other eye (for example, a left eye) of the wearer when the cooling tool 1 is worn. The first panel portion

10A and the second panel portion 10B are each formed to be in an approximately square shape, and the main body portion 10 has two end portions in the width direction whose peripheral edges are formed into an arc shape projecting outward. Note that, the first panel portion 10A and the second panel portion 10B may be formed to be in a square shape, may be formed to be in a rectangular shape, or may have another shape.

[0031]

The first panel portion 10A and the second panel portion 10B have a symmetrical shape with the vertical center line 100 serving as a border, and are integrally continuous at the vertical center line 100. In other words, the main body portion 10 is made of a sheet-shaped material having the first panel portion 10A and the second panel portion 10B that have the same shape and the same size arranged in a symmetric manner. Note that, instead of the configuration that has the first panel portion 10A and the second panel portion 10B integrally formed at the beginning, the configuration may, for example, have the first panel portion 10A and the second panel portion 10B formed as separate bodies mechanically combined.

[0032]

The first panel portion 10A and the second panel portion 10B are not respectively connected in an area proximity to an upper edge portion 13, described later, and an area proximity to a lower edge portion 14, described later, of the vertical center line 100, and are connected only at the vertical center line 100. Thus, the main body portion 10 is constituted to be in a planar shape in which the first panel portion 10A and the

second panel portion 10B are arranged in parallel in a planar direction when the first panel portion 10A and the second panel portion 10B are deployed with the vertical center line 100 as the center. That is, the main body portion 10 is constituted to be able to deploy the first panel portion 10A and the second panel portion 10B with the vertical center line 100 as the center such that the angles formed by the first panel portion 10A and the second panel portion 10B form 180 degrees as illustrated in FIG. 2. Note that "connection" here includes both the configuration in which the first panel portion 10A and the second panel portion 10B are connected from the beginning by being integrally formed, and the configuration in which the first panel portion 10A and the second panel portion 10B formed as separate bodies are mechanically connected.

[0033]

As illustrated in FIG. 1, the main body portion 10 has the upper edge portion 13 positioned on the forehead side of the wearer when the cooling tool 1 is worn, the lower edge portion 14 positioned on a side of a nose of the wearer when the cooling tool 1 is worn, an upper-side slit 15 formed from the upper edge portion 13 toward a side of the lower edge portion 14, and a lower-side slit 16 formed from the lower edge portion 14 toward a side of the upper edge portion 13.

[0034]

The upper-side slit 15 is a cutout in an approximately triangular shape formed to be tapered off from the upper edge portion 13 toward the lower edge portion 14 side. The upper-side slit 15 is constituted to be positioned between

eyebrows of the wearer or the proximity thereof when the cooling tool 1 is worn.

[0035]

The lower-side slit 16 is a cutout in an approximately inversed triangle shape formed to be tapered off from the lower edge portion 14 toward a side of the upper edge portion 13. The lower-side slit 16 has a distal end formed to be an arc shape curved toward the upper edge portion 13 side. This lower-side slit 16 is constituted to be positioned on the bridge of the nose of the wearer or the proximity thereof when the cooling tool 1 is worn.

[0036]

The shapes of the upper edge portion 13, the lower edge portion 14, the upper-side slit 15, and the lower-side slit 16 of the main body portion 10 are appropriately adjusted so as to be easily fitted to the face (in particular, the nose, the eyes, and the forehead) of the wearer, and various kinds of shapes, such as a straight line, an arc shape, or a shape that locally has a projecting portion or a curved portion, are each conveniently employable. For example, while in the above-described embodiment, the upper-side slit 15 and the lower-side slit 16 have been described as the cutouts, the configuration is not limited to this, and the upper-side slit 15 and the lower-side slit 16 may be incision lines.

[0037]

The main body portion 10 including the configuration above has the first panel portion 10A and the second panel portion 10B folded in two along the vertical center line 100

to be folded into a planar shape before use. Note that, by folding and housing the ear straps 30 inward of the main body portion 10 as described later in this state (see FIG. 2 and FIG. 6) allows for downsizing. On the other hand, the main body portion 10 is opened from the edge portion opposite of the vertical center line 100 when it is used, and the main body portion 10 is worn with the folded inner-side surface serving as a surface on the wearer side.

[0038]

The main body portion 10 is constituted to cover the eyes and the areas around the eyes on the face of the wearer when the cooling tool 1 is worn. In this description, "the areas around the eyes" are, for example, a forehead, eyebrows, cheeks, temples, a nose, and the like. Note that, while this embodiment has described that the main body portion 10 is constituted to cover the eyes and the areas around the eyes on the face of the wearer, the configuration is not limited to this, and the configuration may cover only the eyes on the face of the wearer, or the configuration may cover only the area around the eyes. That is, when the cooling tool 1 is worn, the main body portion 10 may be of a size and a shape covering only the eyes, or may have opened regions on the opposite of the eyes of the wearer. The main body portion 10 may be constituted to cover another region in addition to the eyes and/or the areas around the eyes on the face of the wearer, and, for example, may be constituted to cover the entire face of the wearer.

[0039]

Note that, while this embodiment has described that the

main body portion 10 has the inner sheet 11 and the outer sheet 12, the configuration is not limited to this, and the configuration may have only one of the inner sheet 11 or the outer sheet 12. Alternatively, another sheet may be present between the inner sheet 11 and the cooling bodies 20, or another sheet may be present between the outer sheet 12 and the cooling bodies 20.

[0040]

[Configuration Of Cooling Body]

As illustrated in FIG. 1 to FIG. 4, the cooling body 20 has the water retention layer 22 that retains water. In this embodiment, the water retention layer 22 retains water in a state where the cooling tool 1 is enclosed in the packaging body 200.

[0041]

Examples of the configuration of the cooling body 20 include, for example, the configurations (1) and (2) described below.

(1) One configuration of the cooling body 20 is a configuration of a sheet-shaped object having the water retention layer 22. In this case, the water retention layer 22 is obtainable by applying a paste obtained by impregnating a water-retentive material in a powder form or fibrous form with water and mixing them on one surface of the sheet. The sheet may be any of a first sheet 23, a second sheet 24, or a base material layer 21 described later.

(2) Another configuration of the cooling body 20 is a configuration in which the water-retentive material itself has

a shape to form the water retention layer 22. In this case, the water-retentive material is cut into a desired size, and is impregnated with water, and thus, the cooling body 20 is obtained.

Note that, while in this description, the water-retentive material has a water retention capacity (water absorption effect or water removal effect), the type is not specifically limited as long as water can be held, and one that is excellent in water dispersibility is preferred.

[0042]

In this embodiment, the cooling body 20 is in the configuration (1) described above. Specifically, the cooling body 20 is a flat body in a rectangular shape, and includes a base material layer 21 and the water retention layer 22 laminated over the base material layer 21. The cooling body 20 further includes a first sheet 23, and a second sheet 24 arranged to be opposite of the first sheet 23 via the water retention layer 22 and the base material layer 21.

[0043]

Note that, in both configurations of (1) and (2) described above, the cooling body 20 may have a configuration in which the water-retentive material is enclosed inside a bag body formed by joining peripheral edge portions of the first sheet 23 and the second sheet 24 to one another. The cooling body 20 can avoid unintended drop off of the constituent materials to further enhance production efficiency by thus constituting the first sheet 23 and the second sheet 24 into the bag body.

[0044]

[Water Retention Layer and Water-retentive material]

As described above, the cooling body 20 according to the embodiment has a water-retentive material that is capable of absorbing water. In the configuration (1) described above, the water retention layer 22 has the water-retentive material. Specifically, the water retention layer 22 has the water-retentive material dispersed on the base material layer 21, and water held by the water-retentive material. In this case, examples of the water-retentive material include, for example, one type or two or more types selected from carbon components, fiber materials, water-absorbent powders, and the like.

[0045]

The carbon component has a water retention capacity, and, for example, one type or two or more types selected from activated carbon, acetylene black, and graphite are usable. For the fiber material, hydrophilic fibers, among all, cellulose fibers are more preferred to be used. For the cellulose fibers, chemical fibers (synthetic fibers) or natural fibers are usable. Furthermore, examples of the water-absorbent powder other than the above include one type or two or more types selected from vermiculite, sawdust, silica gel, calcium silicate, zeolite, pulp powder, and water-absorbent polymer.

[0046]

Examples of the water-absorbent polymer include a hydrophilic polymer having a crosslinked structure that is able to absorb and retain a liquid of 20 times or more of its own

weight. The water-absorbent polymer may have any shape of a spherical shape, a lump shape, a botryoidal shape, or a fibrous shape. A mass median diameter of the water-absorbent polymer is preferred to be 1 μm or more, is more preferred to be 10 μm or more, and is further preferred to be 100 μm or more. The mass median diameter of the water-absorbent polymer is preferred to be 1000 μm or less, is more preferred to be 700 μm or less, and is further more preferred to be 500 μm or less. The particle diameters of the water-absorbent polymer are measured by a laser diffraction method.

[0047]

Specific examples of the water-absorbent polymer include, for example, one type or two or more types selected from the group consisting of a starch, a crosslinked carboxymethyl cellulose, a polymer, a copolymer, or the like of an acrylic acid or an alkali metal acrylate, a polyacrylic acid and a salt thereof, and a polyacrylate graft polymer. Among these, a polymer, a copolymer, or the like of an acrylic acid or an alkali metal acrylate, a polyacrylic acid and a salt thereof, and a polyacrylate graft polymer are preferred because an amount of water supported is easily maintained within a specific range.

[0048]

Examples of an aspect of the water retention layer when the water-absorbent polymer is used include, for example, (a) an aspect of having a single layer formed such that the water-absorbent polymer is interposed between two water-permeable sheets, (b) an aspect of being arranged into a single layer form with the water-absorbent polymer directly

laminated on the base material layer 21, or (c) an aspect employing a laminated structure in which a first water-absorbent polymer layer in which the water-absorbent polymers are adjacently arranged into a layer form, and a second water-absorbent polymer layer that is adjacent to the first water-absorbent polymer layer and is formed such that powder of a water-absorbent resin is interposed between two water-permeable sheets are arranged.

[0049]

On the other hand, in the configuration (2) described above, the water retention layer 22 functions as the water-retentive material. In this case, the water retention layer 22 and the water-retentive material are, for example, possible to be constituted by various kinds of fiber materials, and can be constituted by hydrophilic fibers or a blend of hydrophilic fibers and synthetic fibers. Examples of the fiber materials include, for example, one type or two or more types selected from polyethylene, polypropylene, polyester, rayon, cotton, pulp, and the like.

[0050]

In both configurations of (1) and (2) described above, the cooling body 20 has a content of the water-retentive material of preferably 5 mg/cm² or more and 20 mg/cm² or less, more preferably 8 mg/cm² or more and 17 mg/cm² or less, and further preferably 10 mg/cm² or more and 13 mg/cm² or less. Having such a content has an advantage of allowing for sufficient water absorption to provide a sufficient cooling function.

[0051]

The water held by the water-retentive material may be derived from an electrolyte solution (for example, a solution of an alkali metal, an alkaline earth metal, or the like), or may be added with an antiseptic agent, a bacteriostatic agent, a fungicide, or an antioxidizing agent of, for example, ethanol, methylparaben, ethylparaben, propylparaben, butylparaben, phenoxyethanol, 1,3-butylene glycol, propylene glycol, or dipropylene glycol.

[0052]

[Water Content]

Given that the water-retentive material has such a configuration, in both configurations of (1) and (2) described above, an initial content of the water held in the water retention layer 22 is preferred to be 1 mass% or more and 20 mass% or less, is more preferred to be 2 mass% or more and 15 mass% or less, is further preferred to be 3 mass% or more and 10 mass% or less, and is further more preferred to be 4 mass% or more and 7 mass% or less of the maximum amount of water absorption of the water retention layer 22. Having such an initial content has an advantage of allowing for providing a cooling sensation for the wearer over a long period of time. There also is an advantage of allowing for providing the wearer a moisture amount sufficient for the wearer to feel a refreshing sensation from menthol.

[0053]

[Measuring Method for Maximum Amount of Water Absorption of Water Retention Layer]

The maximum amount of water absorption of the water retention layer 22 is measurable by, for example, the following method. That is, first, a nylon fabric bag with 250 mesh (61 μm) (100 mm $\times$ 150 mm) and a specimen are weighed to measure a tare weight of the mesh bag and a weight of the specimen. Next, the specimen is put in the above-described mesh bag, the mesh bag is placed standing inside a 300 mL beaker, a 300 mL ion exchanged water is added so as not to directly hit the mesh bag, the mesh bag is immersed for 30 minutes to be fully swollen. Thereafter, the mesh bag is suspended for 10 minutes to undergo drainage, and is weighed to two decimal places with a chemical balance. The maximum amount of water absorption is obtained by using "the mesh bag gross weight," "the mesh bag tare weight," and "the specimen weight" obtained above with the following formula.

"The maximum amount of water absorption" = "the mesh bag gross weight" - "the mesh bag tare weight" - "the specimen weight"

[0054]

Specifically, the initial content of the water is preferred to be 0.04 g/cm² or more and 0.4 g/cm² or less, is more preferred to be 0.08 g/cm² or more and 0.21 g/cm² or less, and is further preferred to be 0.1 g/cm² or more and 0.15 g/cm² or less. Such an initial content has an advantage of allowing for providing a cooling sensation for the wearer over a long period of time. There also is an advantage of allowing for providing the wearer a moisture amount sufficient for the wearer to feel a refreshing sensation from menthol. Furthermore, the

water swells a skin around the eyes of the wearer, which improves sensitivity to the refreshing sensation from menthol, and therefore, there also is an advantage of allowing for providing a comfortable coolness for the wearer.

[0055]

The cooling tool 1 according to the embodiment has a total content of water of preferably 2 g or more and 20 g or less, more preferably 4 g or more and 16 g or less, and further preferably 6 g or more and 10 g or less in both configurations of (1) and (2) described above. Such a total content has an advantage of allowing for providing a cooling sensation for the wearer over a long period of time. There also is an advantage of allowing for providing the wearer a moisture amount sufficient for the wearer to feel a refreshing sensation from menthol. Furthermore, the water swells a skin around the eyes of the wearer, which improves sensitivity to the refreshing sensation from menthol, and therefore, there also is an advantage of allowing for providing a comfortable coolness for the wearer.

[0056]

Here, the initial content of the water is a mass per unit area of water held in the water retention layer 22 immediately after a wrapping material, such as an oxygen barrier bag (in the embodiment, the packaging body 200), is opened. The total content of water is a total mass of water held in the water retention layer 22 immediately after the wrapping material, such as an oxygen barrier bag (in the embodiment, the packaging body 200), is opened. Therefore, when the cooling tool 1 has

two or more cooling bodies 20, a total mass of the water held by the water retention layers 22 of the respective cooling bodies 20 is the total content of the water.

[0057]

The initial content of the water and the total content of the water are measurable by, for example, the following method. That is, first, the packaging body 200 is opened and the cooling tool 1 is taken out, and the portion of the cooling tool 1 that contains the water, that is, the cooling body 20 is taken out from the cooling tool 1. After the cooling body 20 is taken out, the cooling body 20 is installed on a moisture meter (Kett moisture meter FD-240, manufactured by Kett Electric Laboratory Co. Ltd.). The mass of the cooling body 20 is measured in 30 seconds after the start of opening the packaging body 200. Thereafter, The cooling body 20 is dried by heating at 70°C for 10 hours and the mass of the cooling body 20 after drying by heating is measured with the moisture meter. Using the measured "mass before drying" and "mass after drying" of the cooling body 20, the total content of the water is obtained by the following formula.

"Total content of water" = "mass before drying" - "mass after drying"

[0058]

Thereafter, a total area of an facing surface of the water retention layer 22 facing the first sheet 23 is measured. In the case of the configuration (1) described above, the total area of the facing surface of the base material layer 21 facing the first sheet 23 via the water retention layer 22 is measured,

and the total area of the base material layer 21 is regarded as the total area of the above-described water retention layer 22. In the case of the configuration (2) described above, the total area of the facing surface of the water retention layer 22 facing the first sheet 23 is measured. Using the measured "mass before drying" and "mass after drying" of the cooling body 20, and the "total area of the water retention layer 22," the initial content of the water is calculated by the following formula.

$$\text{"Initial content of water"} = (\text{"mass before drying"} - \text{"mass after drying"}) / \text{"total area of water retention layer 22"}$$

[0059]

[Base Material Layer]

The base material layer 21 is disposed so as to cover a surface of the water retention layer 22 on an opposite side of the first sheet 23 or the second sheet 24. In this embodiment, the base material layer 21 covers the surface of the water retention layer 22 on the opposite side of the first sheet 23.

[0060]

When the base material layer 21 is arranged on a side of the second sheet 24 (non-eye-facing side of the wearer), the base material layer 21 covers the surface of the water retention layer 22 on an opposite side of the first sheet 23. In this case, the base material layer 21 is preferred to have low-air permeability or non-air permeability and low-moisture permeability or non-moisture permeability. The base material layer 21 having such a configuration has an advantage of allowing for defining an evaporation release direction of the

water retention layer 22 on the side of the first sheet 23 (the eye-facing side of the wearer). There is an advantage of improving productivity when the cooling body 20 is installed in the main body portion 10 by laminating the water retention layer 22 on the base material layer 21.

[0061]

For such a base material layer 21, for example, a synthetic-resin film is usable, examples of which include a polyethylene film, a polyethylene terephthalate film, and the like. The synthetic-resin film may be a single layer or may be a laminated body of a plurality of layers. A nonwoven fabric, a paper or a film, or a laminated body of two types or more thereof is usable.

[0062]

Note that, while this embodiment has described that the base material layer 21 covers the surface of the water retention layer 22 on the opposite side of the first sheet 23, the configuration is not limited to this, and a configuration with the base material layer 21 disposed to cover the surface of the water retention layer 22 on the opposite side of the second sheet 24 or a configuration without the base material layer 21 is also allowed.

[0063]

[First Sheet and Second Sheet]

The first sheet 23 is disposed on the eye-facing side of the wearer. In this embodiment, the first sheet 23 has air permeability. Specifically, the first sheet 23 has air permeability rate in at least a region between the eyes of the

wearer and the water retention layer 22 of preferably 350 seconds/100 mL or less, and more preferably 100 seconds/100 mL or less from the aspect of avoiding excessive humidification while slowly releasing the generated vapor. The first sheet 23 is also possible to enhance a cooling effect on the face by evaporative heat dissipation in association with water evaporation by having such air permeability rate. Note that the first sheet 23 may have a configuration having a part thereof without air permeability when such air permeability rate is satisfied.

[0064]

The first sheet 23 has a moisture permeability. Specifically, the first sheet 23 has a moisture permeability in a region between at least the eyes of the wearer and the water retention layer 22 of preferably $12000 \text{ g/m}^2 \cdot 24 \text{ hr}$ or less, more preferably $11000 \text{ g/m}^2 \cdot 24 \text{ hr}$ or less, further preferably $10000 \text{ g/m}^2 \cdot 24 \text{ hr}$ or less, further more preferably $8000 \text{ g/m}^2 \cdot 24 \text{ hr}$ or less from the aspect of reducing stuffiness and wetness when worn. This moisture permeability is preferably $2000 \text{ g/m}^2 \cdot 24 \text{ hr}$ or more, more preferably $2500 \text{ g/m}^2 \cdot 24 \text{ hr}$ or more, and further preferably $3000 \text{ g/m}^2 \cdot 24 \text{ hr}$ or more from the aspect of enhancing a cooling effect by evaporative heat dissipation in association with water evaporation. When such moisture permeability is satisfied, the first sheet 23 may have a configuration having a part thereof without moisture permeability.

[0065]

Furthermore, the first sheet 23 may have a waterproof performance. Specifically, the first sheet 23 has a water

resistance level in at least the region between the eyes of the wearer and the water retention layer 22 of preferably 300 mm or more, more preferably 400 mm or more, and further preferably 500 mm or more from the aspect of reducing stuffiness and wetness when worn. Furthermore, it is the most preferred to be 1000 mm or more. When such a water resistance level is satisfied, the first sheet 23 may have a configuration having a part thereof without a waterproof performance. While the first sheet 23 has been described to have a waterproof performance, the configuration is not limited to this, and may have a non-waterproof performance (permeability).

[0066]

The second sheet 24 is disposed on the non-eye-facing side of the wearer. The second sheet 24 may have any of air permeability, low-air permeability, or non-air permeability. However, the second sheet 24 is preferred to have low-air permeability or non-air permeability from the aspect of defining the evaporation release direction of the water retention layer 22 on the side of the inner sheet 11 (the eye-facing side of the wearer).

[0067]

The second sheet 24 may have any of moisture permeability, low-moisture permeability, or non-moisture permeability. However, the second sheet 24 is preferred to have low-moisture permeability or non-moisture permeability from the aspect of defining an evaporation release direction of the water retention layer 22 on the side of the inner sheet 11 (the eye-facing side of the wearer).

[0068]

Furthermore, the second sheet 24 may have a waterproof performance or may have a non-waterproof performance (water permeability).

[0069]

The materials of the first sheet 23 and the second sheet 24 may be the same as those of the inner sheet 11 and the outer sheet 12 or may be different.

[0070]

While in this embodiment, the cooling body 20 has been described to have the first sheet 23 and the second sheet 24, the configuration is not limited to this, and a configuration may have only any one of the first sheet 23 or the second sheet 24. A configuration may secure the base material layer 21 and the water retention layer 22 on the inner sheet 11 or the outer sheet 12 without having the first sheet 23 or the second sheet 24, or a configuration may enclose the base material layer 21 and the water retention layer 22 between the inner sheet 11 and the outer sheet 12. Furthermore, when the cooling body 20 does not have the base material layer 21 in addition to the first sheet 23 and the second sheet 24, a configuration may secure the water retention layer 22 on the inner sheet 11 or the outer sheet 12, or a configuration may enclose the water retention layer 22 between the inner sheet 11 and the outer sheet 12.

The configuration may be without the first sheet 23, the second sheet 24, the inner sheet 11, or the outer sheet 12.

[0071]

[Amount of Water Vapor Emission of Cooling Body]

The cooling body 20 has an amount of water vapor emission to the eye-facing side of the wearer released in 60 minutes from the start of water vapor emission of preferably 2.5 mg/(cm²·hour) or more, more preferably 5.0 mg/(cm²·hour) or more, and further preferably 7.5 mg/(cm²·hour) or more. Such an amount of water vapor emission has an advantage of allowing for effectively releasing the heat transferring from the eyes and the areas around the eyes of the wearer to the cooling body 20 from the cooling body 20. There also is an advantage of allowing for an appropriate balance of the cooling sensation and the refreshing sensation provided for the wearer. Furthermore, the water swells a skin around the eyes of the wearer, which improves sensitivity to the refreshing sensation from menthol, and therefore, there also is an advantage of allowing for providing a comfortable coolness for the wearer.

[0072]

The cooling body 20 has the amount of water vapor emission to the eye-facing side of the wearer released in 60 minutes from the start of water vapor emission of preferably 30 mg/(cm²·hour) or less, more preferably 20 mg/(cm²·hour) or less, and further preferably 15 mg/(cm²·hour) or less. Such an amount of water vapor emission has an advantage of allowing for reducing stuffiness and wetness by reducing humidity around the eyes and the areas around the eyes of the wearer while providing the wearer a moisture amount sufficient for the wearer to feel the refreshing sensation from menthol. The water swells the skin around the eyes of the wearer, which improves sensitivity to the refreshing sensation from menthol, and therefore, there

also is an advantage of allowing for providing a comfortable coolness for the wearer.

[0073]

The amount of water vapor emission to the eye-facing side of the wearer is a numerical value measured as follows by using a measurement device 40 illustrated in FIG. 7. Note that the following description is intended for the cooling body 20 in a sealed state being enclosed in a waterproof wrapping material (in this embodiment, the packaging body 200) or the like, and a time period it takes from opening of the waterproof wrapping material or the like is started, which is the start of opening, to the installation on the measurement device 40 illustrated in FIG. 7, that is, the time point after 5 seconds from the start of opening is defined as a "water vapor emission starting time point." The measurement device 40 illustrated in FIG. 7 includes a measurement chamber (volume 4.2 L) 41 made of aluminum, an inflow passage 42 through which dehumidified air (humidity of less than 2%, flow rate of 2.1 L/minute) is flowed in to a lower portion of a measurement chamber 41, an outflow passage 43 through which the air is flowed out from an upper portion of the measurement chamber 41, an inlet thermohygrometer 44 and an inlet flowmeter 45 disposed in the inflow passage 42, an outlet thermohygrometer 46 and an outlet flowmeter 47 disposed in the outflow passage 43, and a thermometer (thermistor) 48 disposed within the measurement chamber 41. For the thermometer 48, a thermometer having a temperature resolution of approximately 0.01°C is used. Note that the amount of water vapor emission in this description

means a total quantity of the water vapor amount measured for 60 minutes after the "water vapor emission starting time point" of the cooling body 20 as a starting point. When the cooling tool 1 has two or more cooling bodies 20, it is preferred that a total amount of water vapor emission of the respective cooling bodies 20 satisfies the above-described value.

[0074]

[Shape and Arrangement of Cooling Body]

The cooling body 20 has a planar shape not specifically limited, and may be in a circular shape, a polygonal shape, or the like. The planar shape of the cooling body 20 is preferred to be a quadrilateral shape, such as a rectangular shape and an approximately square shape, from the aspect of production efficiency, handleability, and a cooling effect, and is more preferred to be an approximately square shape from the aspect of handleability.

[0075]

The cooling bodies 20 are arranged in the main body portion 10 such that at least a part thereof comes directly or indirectly in contact with the eyes and/or the areas around the eyes of the wearer when the cooling tool 1 is worn. Specifically, the cooling bodies 20 are arranged in the main body portion 10 such that at least a part thereof comes in contact with the eyes and the areas around the eyes of the wearer via the inner sheet 11 when the cooling tool 1 is worn.

[0076]

Note that, in this embodiment, at least a part of the cooling bodies 20 has been described to come in contact with

the eyes and the areas around the eyes of the wearer via the inner sheet 11, the configuration is not limited to this, and at least a part of the cooling bodies 20 comes directly in contact with the eyes and/or the areas around the eyes of the wearer. When the cooling bodies 20 come directly in contact with the eyes and/or the areas around the eyes of the wearer is when the main body portion 10 does not have the inner sheet 11.

[0077]

It is only necessary that at least a part of the cooling bodies 20 comes directly or indirectly in contact with the areas around the eyes of the wearer. That is, the cooling bodies 20 may have opened regions on the opposite of the eyes of the wearer when the cooling tool 1 is worn. Furthermore, at least a part of the cooling bodies 20 may be directly or indirectly in contact with a whole region of the face of the wearer.

[0078]

In this embodiment, the cooling bodies 20 are respectively disposed on the first panel portion 10A and the second panel portion 10B so as to form symmetry with the vertical center line 100 as a border (see FIG. 1 and FIG. 2). In the illustrated example, one each on the first panel portion 10A and the second panel portion 10B, which is a total of two cooling bodies 20 are installed.

[0079]

Note that two cooling bodies 20 may be disposed in each of the first panel portion 10A and the second panel portion 10B, or one cooling body 20 may be disposed in the whole main body portion 10. When a plurality of the cooling bodies 20 are

disposed, the plurality of cooling bodies 20 may have the same cooling characteristics or may have different cooling characteristics, but it is more preferred when they have the same cooling characteristics.

[0080]

[Configuration of Ear Strap]

The ear straps 30 are disposed at two ends of the main body portion 10 in the width direction, and are constituted to enable the main body portion 10 to be held on the face of the wearer such that the main body portion 10 covers at least the eyes and/or the areas around the eyes on the face of the wearer (see FIG. 5). Specifically, the ear straps 30 are constituted to enable the main body portion 10 to be held on the face of the wearer such that at least the eyes and the areas around the eyes on the face of the wearer are covered by the main body portion 10.

[0081]

Note that the ear straps 30 are only necessary to be constituted to allow the main body portion 10 to be held on the face of the wearer such that at least the areas around the eyes on the face of the wearer are covered by the main body portion 10. The ear straps 30 may be constituted to allow the main body portion 10 to be held on the face of the wearer such that all the face of the wearer is covered with the main body portion 10.

[0082]

As illustrated in FIG. 2 and FIG. 6, the ear straps 30 are folded inwardly and housed in the main body portion 10 before

the application of the cooling tool 1. As illustrated in FIG. 1 and FIG. 5, the ear straps 30 are deployed outward in the width direction of the main body portion 10 during the application of the cooling tool 1.

[0083]

As illustrated in FIG. 1, the ear straps 30 are disposed to incline to a lower side of the main body portion 10 when worn with respect to the width direction of the main body portion 10. The ear straps 30 are both bonded on the main body portion 10 using bonded portions 50 inclined with respect to the vertical direction of the main body portion 10 when worn.

[0084]

Examples of the configuration of the bonded portion 50 according to the embodiment include, for example, the following configurations (1) and (2).

(1) When the main body portion 10 and the ear straps 30 are mutually connected via another member, such as an adhesive agent (for example, a hot-melt-type adhesive agent), the other member, such as the adhesive agent functions as the bonded portion 50.

(2) When the main body portion 10 and the ear straps 30 are mutually bonded not via another member, which is, for example, when the main body portion 10 and the ear straps 30 are mutually connected by heat fusion, a bonded region where the ear strap 30 is bonded on the main body portion 10 and a bonded region where the main body portion 10 is bonded on the ear strap 30 each function as the bonded portion 50.

[0085]

As illustrated in FIG. 1, each of the ear straps 30 has an ear strap main body 31 and an ear strap hole 32 through which an ear of the wearer is insertable. The ear strap main body 31 has an upper side 31a, a lower side 31b, a free edge 31c on a free side of the ear strap 30 that is not bonded on the main body portion 10, and a bonded edge 31d bonded on the main body portion 10.

[0086]

In this embodiment, the ear strap main body 31 has a planar surface and has an approximately square shape. Specifically, the upper side 31a and the lower side 31b are tapered off toward the free edge 31c from a side of the bonded edge 31d, and are curved at portions connecting to the free edge 31c. The bonded edge 31d has a shape along a peripheral edge of the first panel portion 10A or the second panel portion 10B.

[0087]

The ear strap hole 32 is an arc-shaped incision line formed from the proximity of the bonded edge 31d of the ear strap main body 31 to the proximity of the free edge 31c of the ear strap main body 31. This ear strap hole 32 is constituted such that the ear of the wearer is insertable. Note that the shape of the ear strap hole 32 is not at all limited, and may be an incision line in a straight line, or may be an opening through which the ear of the wearer is insertable.

[0088]

The ear straps 30 may be of a material similar to that of the main body portion 10 or may be of a different material, but is preferred to be a stretchable material, and the material

likely to stretch in the width direction of the main body portion 10 is preferable from the aspect of improving fitting of the main body portion 10. In this embodiment, the ear straps 30 are preferred to be made of a nonwoven fabric, and is more preferred to be a stretchable nonwoven fabric. Note that the ear straps 30 may have a multi-layer structure in which an elastomer film is laminated on the nonwoven fabric from the aspect of further enhancing stretchability. The ear straps 30 are preferred to include a thermoplastic resin as a constituent fiber from the aspect of bondability with the main body portion 10. Furthermore, from the aspect of workability, it is more preferred to include polypropylene. Note that the ear straps 30 may further include a thermoplastic resin other than polypropylene, for example, is preferred to further include one type or more selected from the group consisting of urethane, polyethylene, and polyethylene terephthalate, and is more preferred to use a synthetic fiber made of urethane. Such a configuration allows for efficiently developing flexibility and a fitting performance of the ear straps 30 as well as developing sufficient strength when the cooling tool 1 is applied.

[0089]

Note that the ear straps 30 are not limited to the above-described planar-shaped ear straps as long as the configuration allows the main body portion 10 to be held on the face the wearer, and those usually usable for securing the cooling tool are allowed to be conveniently used. For example, various kinds of configurations, such as rubber cord ear straps

or one or a plurality of bands bridged across the two end portions of the first panel portion 10A and the second panel portion 10B in the width direction, are employable. The ear straps 30 are not limited to the configuration of different members bonded on the two end portions of the main body portion 10 in the width direction, and may have a configuration of being formed integrally with the main body portion 10.

[0090]

[Menthol]

As described above, the cooling tool 1 according to the embodiment is perfumed with menthol. That is, the cooling tool 1 contains the menthol. Note that, in this description, the "menthol" includes both aspects of an aspect including both l-menthol and dl-menthol and an aspect including only one of l-menthol or dl-menthol.

[0091]

[Method for Perfuming with Menthol and Position of Perfuming]

The method for perfuming the cooling tool 1 with the menthol is not limited particularly, and various kinds of known perfuming method is employable. For example, examples include a method that impregnates with a solution obtained by dissolving the menthol with a solvent, such as ethanol, a method that disposes a sheet impregnated with a liquid separately from the inner sheet 11 or the like, a method that sprays, a method that directly applies the menthol on a sheet, such as the inner sheet 11, and the like. In addition, examples include a method that applies a solution obtained by dissolving the menthol with a

solvent, such as ethanol, and a method that disposes a sheet on which a solution is applied separately from the inner sheet 11 or the like.

[0092]

In this embodiment, the menthol is directly applied on an inner surface of the second sheet 24. Note that the position to perfume with the menthol is not limited on the second sheet 24. For example, the inner sheet 11 may be perfumed, the outer sheet 12 may be perfumed, the first sheet 23 may be perfumed, or the water retention layer 22 may be perfumed.

[0093]

[Content of Menthol]

Regardless of the method for perfuming with the menthol or the position to perfume with the menthol, the cooling tool 1 according to the embodiment has an initial content of the menthol of preferably 0.02 mg/cm² or more and 0.35 mg/cm² or less, more preferably 0.04 mg/cm² or more and 0.2 mg/cm² or less, and further preferably 0.06 mg/cm² or more and 0.12 mg/cm² or less. Having such an initial content has an advantage of allowing for providing a refreshing sensation for the wearer.

[0094]

Regardless of the method for perfuming with the menthol or the position to perfume with the menthol, the cooling tool 1 according to the embodiment has a total content of the menthol of preferably 0.9 mg or more and 17 mg or less, more preferably 1.9 mg or more and 10 mg or less, and is further preferably 2.8 mg or more and 6 mg or less. Having such a total content has an advantage of allowing for providing a refreshing sensation

for the wearer.

[0095]

Here, the initial content of the menthol is a mass per unit area of the menthol with which the cooling tool 1 is perfumed. The total content of the menthol is a total mass of the menthol with which the cooling tool 1 is perfumed. Therefore, when the cooling tool 1 has a plurality of positions perfumed with the menthol, the total mass of each menthol is the total content of the menthol.

[0096]

The initial content of the menthol and the total content of the menthol are, for example, measurable by the following method. That is, first, the wrapping material (in this embodiment, the packaging body 200), such as the oxygen barrier bag is opened and the cooling tool 1 is taken out, the cooling tool 1 is impregnated in ethanol for 24 hours, and thus, an extraction liquid in which the menthol is extracted in the ethanol is obtained. Thereafter, the obtained extraction liquid is quantitatively determined with a gas chromatograph-mass spectrometer (GC-MS) (Agilent 6890N (product name), manufactured by Agilent Technologies, Inc.), and thus, the total content of the menthol is obtainable. Note that the total mass of the menthol contained in the cooling tool 1 immediately after opening the wrapping material can be regarded as the total mass of the menthol with which the cooling tool 1 is perfumed, and therefore, the total content of the menthol immediately after the wrapping material is opened is used.

[0097]

Thereafter, the total area of the surface perfumed with the menthol of the sheet perfumed with the menthol is measured. In this embodiment, the total area of the surface of the second sheet 24 facing the base material layer 21 is measured. Using the "total content of menthol" and the "total area of the sheet," the initial content of the menthol is obtained by the following formula.

$$\text{"Initial content of menthol"} = \text{"total content of menthol"} / \text{"total area of sheet"}$$

[0098]

[Volatilization Volume of Menthol on Eye-Facing Side]

The cooling tool 1 has a menthol volatilization volume to the eye-facing side of the wearer released in 60 minutes from the start of volatilization of menthol (for example, from the start of opening of the packaging body 200) of preferably 0.01 $\mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or more, more preferably 0.1 $\mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or more, and further preferably 0.5 $\mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or more. Such a menthol volatilization volume has an advantage of allowing for providing a refreshing sensation for the wearer. There also is an advantage of allowing for an appropriate balance of the cooling sensation and the refreshing sensation provided for the wearer.

[0099]

The cooling tool 1 has the menthol volatilization volume to the eye-facing side of the wearer released in 60 minutes from the start of volatilization of the menthol (for example, from the start of opening of the packaging body 200) of preferably

1000 $\mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or less, more preferably 100 $\mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or less, and further preferably 50 $\mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or less. Such a menthol volatilization volume has an advantage of allowing for preventing the wearer from feeling a stimulation from the menthol.

[0100]

The menthol volatilization volume to the eye-facing side of the wearer is measurable using, for example, a measurement device 60 illustrated in FIG. 8 and the gas chromatograph-mass spectrometer (GC-MS) (Agilent 6890N (product name), manufactured by Agilent Technologies, Inc.). The measurement device 60 illustrated in FIG. 8 includes a pump 61, a container 62 that houses ethanol E, a funnel 63 (or an apparatus in a funnel shape) in an appropriate size, a first hose 64 that couples the pump 61 to the container 62, and a second hose 65 that couples the container 62 to the funnel 63. The second hose 65 has an end portion on a side of the container 62 immersed in the ethanol E. When the menthol volatilization volume to the eye-facing side of the wearer is measured, first, the packaging body 200 is opened and the cooling tool 1 is taken out, and the cooling tool 1 is placed on the large-diameter portion of the funnel 63. At this time, the cooling tool 1 is placed on the funnel 63 such that the inner sheet 11 of the cooling tool 1 faces a side of the funnel 63. Next, the air volatilized from the inner sheet 11 of the cooling tool 1 is suctioned with the pump 61, and the suctioned air is bubbled with the ethanol E in the container 62. The suction with the pump 61 is started in 15 seconds after the packaging body 200 is opened, and is performed

at 0.2 mL/hour for one hour. After the ethanol solution in which the menthol is dissolved is diluted to an appropriate amount, the menthol content is quantitatively determined with the gas chromatograph-mass spectrometer to calculate the menthol volatilization volume to the eye-facing side of the wearer.

[0101]

Note that, the cooling tool 1 according to the embodiment may contain another refreshing ingredient within a range that does not impair the effect of the cooling tool 1. For example, for the refreshing ingredient, d-camphor, dl-camphor, d-borneol, dl-borneol, geraniol, or the like may be contained.

[0102]

[Balance of Cooling Sensation and Refreshing Sensation]

The cooling tool 1 according to the embodiment has a value obtained by the initial content of the water [g/cm²] × the initial content of the menthol [mg/cm²] × 1000 of preferably 4 or more and 40 or less. With the cooling tool 1 having such a configuration, the water swells a skin around the eyes of the wearer, which improves sensitivity to the refreshing sensation from the menthol, and therefore, there is an advantage of allowing for providing a comfortable coolness for the wearer. The cooling tool 1 according to the embodiment thus allows for an appropriate balance of the cooling sensation and the refreshing sensation provided for the wearer.

[0103]

Note that the cooling tool 1 according to the embodiment is capable of changing the sensation provided for the wearer, the cooling period, and the refreshing period by adjusting the

initial content of the water and the initial content of the menthol. For example, there are following cases (1) to (3).
[0104]

(1) When it is desired that the cooling sensation is provided more than the refreshing sensation for the wearer, or when it is desired that the cooling period is increased longer than the refreshing period, the initial content of the water is preferably 0.2 g/cm^2 or more and 0.4 g/cm^2 or less, and the initial content of the menthol is preferably 0.02 mg/cm^2 or more and 0.06 mg/cm^2 or less.

(2) When it is desired that the refreshing sensation is provided more than the cooling sensation for the wearer, or when it is desired that the refreshing period is increased longer than the cooling period, the initial content of the water is preferably 0.04 g/cm^2 or more and 0.1 g/cm^2 or less, and the initial content of the menthol is preferably 0.2 mg/cm^2 or more and 0.35 mg/cm^2 or less.

(3) When it is desired that the cooling sensation and the refreshing sensation are similarly provided for the wearer, or when it is desired that the cooling period and the refreshing period are made equal, the initial content of the water is preferred to be 0.1 g/cm^2 or more and 0.18 g/cm^2 or less, and the initial content of the menthol is preferred to be 0.06 mg/cm^2 or more and 0.24 mg/cm^2 or less.

[0105]

Note that any cases of the above-described (1) to (3) are capable of providing a comfortable coolness for the wearer.

[0106]

[Method for Using Cooling Tool]

Next, a method for using the cooling tool 1 according to the embodiment will be described. As illustrated in FIG. 6, the cooling tool 1 according to the embodiment is stored in a state of being enclosed in the waterproof packaging body 200. In this storage state, the ear straps 30 are folded inward of the main body portion 10, and the main body portion 10 is folded with the vertical center line 100 as the center. The water retention layer 22 of the cooling body 20 retains water in the state where the cooling tool 1 is enclosed in the packaging body 200.

[0107]

When the cooling tool 1 is used, first, the wearer opens the packaging body 200, and takes out the cooling tool 1 from the packaging body 200. After taking out the cooling tool 1 from the packaging body 200, the wearer opens the main body portion 10 folded in two from the sides of the two end portions in the width direction, and takes out the pair of ear straps 30 from the inward of the main body portion 10. As illustrated in FIG. 5(a), the ear straps 30 are pulled with the fingers with the main body portion 10 being placed against the eyes and the areas around the eyes of the wearer and insert the ears in the ear strap holes 32. Thus hooking the pair of ear straps 30 onto the right and left ears of the wearer allows the main body portion 10 to be held on the face of the wearer so as to maintain the state in which the eyes and the areas around the eyes of the wearer are covered by the main body portion 10 as illustrated in FIG. 5(b).

[0108]

Note that the cooling tool 1 according to the embodiment has the water retention layer 22 retaining water in the state where the cooling tool 1 is enclosed in the packaging body 200, and therefore, it is not necessary to cause the water retention layer 22 to retain the water by, for example, damping the cooling tool 1 in water after taking the cooling tool 1 out of the packaging body 200. Therefore, there is an advantage that the cooling tool 1 is usable just by opening the packaging body 200. In addition, when only one cooling tool 1 is enclosed in the packaging body 200, hygienic advantages are also provided.

[0109]

At least a part of the cooling bodies 20 comes in contact with the eyes and the areas around the eyes of the wearer via the inner sheet 11 in such a state where the eyes and the areas around the eyes of the wearer are covered with the main body portion 10, and thus, heat transfers from the eyes and the areas around the eyes of the wearer to the cooling bodies 20 and the eyes and the areas around the eyes of the wearer are cooled down.

[0110]

When the cooling bodies 20 are warmed by the heat of the eyes and the areas around the eyes of the wearer, the water held in the water retention layer 22 evaporates, and thus, the water vapor passes through the first sheet 23 and the inner sheet 11 and is released to the skin side of the wearer. Therefore, the heat transferring from the eyes and the areas around the eyes of the wearer to the cooling bodies 20 is released from the cooling bodies 20. Furthermore, the heat transfers from the

cooling bodies 20 to the external air, and therefore, the heat transferring from the eyes and the areas around the eyes of the wearer to the cooling bodies 20 is released from the cooling bodies 20. As soon as the heat is released from the cooling bodies 20, the heat transfers again from the eyes and the areas around the eyes of the wearer to the cooling bodies 20, and therefore, the eyes and the areas around the eyes of the wearer can be further cooled down. Such a cooling mechanism allows the cooling tool 1 according to the embodiment to provide the cooling sensation for the wearer over a long period of time.

[0111]

The cooling tool 1 according to the embodiment has the inner surface of the second sheet 24 perfumed with the menthol. Therefore, when the menthol volatilizes due to, for example, an effect of an ambient temperature of the cooling tool 1, the volatilized menthol is released to the skin side of the wearer. However, immediately after the wearer wears the cooling tool 1, the wearer does not feel the refreshing sensation even though the menthol touches the eyes and the areas around the eyes of the wearer because the eyes and the areas around the eyes of the wearer do not have enough moisture. After a few seconds after the wearer wears the cooling tool 1, the eyes of the wearer get moistened and the skin around the eyes of the wearer swells by the water vapor released from the cooling bodies 20, and therefore, the sensitivity to the refreshing sensation improves from the menthol attached on the eyes and the areas around the eyes of the wearer.

[0112]

Thus, the wearer does not feel both the cooling sensation and the refreshing sensation immediately after wearing the cooling tool 1. That is, the wearer only feels the cooling sensation by the cooling bodies 20 immediately after wearing the cooling tool 1. The wearer then gradually starts to feel the refreshing sensation from the menthol as wearing the cooling tool 1, and finally, feels both the cooling sensation and the refreshing sensation by a combined effect of the water and the menthol.

[0113]

As described above, the cooling tool 1 according to the embodiment is capable of providing the cooling sensation and the refreshing sensation for the wearer. In particular, the cooling tool 1 according to the embodiment has the value of the initial content of the water $[g/cm^2] \times$ the initial content of the menthol $[mg/cm^2] \times 1000$ of 4 or more and 40 or less, thereby being capable of providing an appropriate balance of the cooling sensation and the refreshing sensation provided for the wearer, which allows for providing a comfortable coolness for the wearer. Even when the aspect has a comparatively small initial content of the menthol, total content of the menthol, or menthol volatilization volume to the eye-facing side of the wearer released in 60 minutes from the start of volatilization of the menthol, the swelling of the skin due to the water improves the sensitivity to the refreshing sensation by the menthol, and therefore, there is an advantage of allowing for providing a pleasant coolness for the wearer.

[0114]

[Advantages of Cooling Tool According to Embodiment]

Thus, the cooling tool 1 according to the embodiment is the cooling tool 1 including the main body portion 10 that covers at least the eyes and/or the areas around the eyes on the face of the wearer, and the cooling body 20 disposed in the main body portion 10. The cooling body 20 has the water retention layer 22 retaining water. The water retention layer 22 has the initial content of the water of 0.04 g/cm^2 or more and 0.4 g/cm^2 or less. The cooling body 20 is disposed in the main body portion 10 such that at least a part thereof comes directly or indirectly in contact with the eyes and/or the areas around the eyes of the wearer when worn. The cooling tool 1 contains the menthol. The value obtained from the initial content of the water $[\text{g/cm}^2] \times$ the initial content of the menthol $[\text{mg/cm}^2] \times 1000$ is 4 or more and 40 or less.

[0115]

With the cooling tool 1 including such a configuration, an appropriate balance of the cooling sensation and the refreshing sensation provided for the wearer can be provided, and there is an advantage of allowing for providing a comfortable coolness for the wearer.

[0116]

[Modification]

The cooling tool according to the present disclosure is not limited to the above-described embodiment, and can be subject to various kinds of modifications within a range not departing from the technical idea of the present invention.

[0117]

For example, while the above-described embodiment has described that the whole cooling tool 1 is enclosed in the packaging body 200, the configuration is not limited to this, and when the cooling body 20 is not integrated with the main body portion 10 (when it can be added later), the main body portion 10 and the cooling body 20 may be individually packed, or only the cooling body 20 may be packed.

[0118]

Furthermore, while the above-described embodiment has described that the main body portion 10 has the upper-side slit 15 and the lower-side slit 16, the configuration is not limited to this, and the configuration does not have to have the upper-side slit 15 and the lower-side slit 16.

[0119]

Furthermore, while the above-described embodiment has described that the ear strap 30 is disposed to incline to the lower side of the main body portion 10 when worn with respect to the width direction of the main body portion 10, the configuration is not limited to this, and, for example, the ear strap 30 may be disposed along the width direction of the main body portion 10.

[0120]

While the above-described embodiment has described that it is preferred to use a nonwoven fabric as the material of the inner sheet 11, the nonwoven fabric may further have hydrophilicity. That is, a hydrophilic nonwoven fabric may be used as the material of the inner sheet 11. Using a hydrophilic nonwoven fabric as the material of the inner sheet 11 causes

the inner sheet 11 to absorb and retains the evaporated water and the volatilized menthol, and therefore, there is an advantage of allowing for improvement in cooling sensation and refreshing sensation provided for the wearer.

[0121]

For the hydrophilic nonwoven fabric, for example, a nonwoven fabric made of hydrophilic fibers, a nonwoven fabric on which a hydrophilic treatment with a hydrophilizing agent has been performed, or the like is usable. The hydrophilic fibers preferably include, for example, cellulose fibers or polyacrylonitrile fibers. Examples of the cellulose fiber include fibers of rayon, lyocell (registered trademark), Tencel (registered trademark), cotton, and the like. The hydrophilic fibers preferably include, for example, cellulose fibers or polyacrylonitrile fibers. These are usable alone or in combination of two or more types. It is also preferred to use hydrophilic synthetic fibers. For the hydrophilic synthetic fibers, it is preferred to use acrylic fibers, polyethylene terephthalate fibers hydrophilized in a treatment with a hydrophilizing agent, such as a fiber oiling agent, polyethylene fibers, polypropylene fibers, or the like. Examples of a method for the hydrophilic treatment include a surface adhesion treatment or kneading with a hydrophilizing agent, or the like. For the hydrophilizing agent, a general surfactant for fiber, a hydrophilic oiling agent, or the like is usable.

[0122]

Note that, in this description, a nonwoven fabric with

hydrophilicity of 1% or more is defined as "the hydrophilic nonwoven fabric." This hydrophilicity is measurable by, for example, the method (1) to (7) below.

(1) A nonwoven fabric sample is placed in an environment with a temperature of 25°C and a humidity of 25% for 24 hours, and is dried.

(2) 100 squares each in a size of 1 cm × 1 cm are drawn on the nonwoven fabric.

(3) The nonwoven fabric sample is secured on a desired frame without the backside surface of the nonwoven fabric sample coming in contact with a workbench. At this time, it is made sure that the nonwoven fabric sample does not sag or stretch.

(4) 3 μ L ion exchanged water is collected with a micropipette and is dripped on the nonwoven fabric sample. One drop is dripped in one square. The time is measured from the first dripping, and the dripping is performed at the pace of one drop per 5 seconds.

(5) When the tenth dripping is finished, the first water droplet is evaluated after 60 seconds from the first dripping, and subsequently, the states of the second and subsequent water droplets are evaluated in order at the pace of one drop per 5 seconds. The evaluations are the following three types, **a** to **c**.

a: water droplet stays in spherical shape

b: water droplet fails to keep spherical shape and spreads on nonwoven fabric

c: water droplet soaks through nonwoven fabric

(6) When evaluation of ten water droplets is finished,

the above-described (4) and (5) are repeated for ten times to evaluate a total of a hundred water droplets.

(7) In above-described **a** to **c**, **a** is 0 points, **b** is 0.5 points, and **c** is 1 point. The hydrophilicity is calculated using the following formula with the number of water droplets evaluated as **a** being "A," the number of water droplets evaluated as **b** being "B," and the number of water droplets evaluated as **c** being "C."

$$\text{Hydrophilicity (\%)} = \{(0 \times A + 0.5 \times B + 1 \times C)/100\} \times 100$$

[0123]

It is apparent from the description of the claims that the modifications as described above are included in the scope of the present invention.

[0124]

Regarding the above-described embodiment, the present invention further discloses the following cooling tool.

[0125]

<1>

A cooling tool including:

a main body portion that covers at least eyes and/or areas around the eyes on a face of a wearer; and

a cooling body disposed in the main body portion, wherein the cooling body includes a water retention layer that retains water,

the water retention layer has an initial content of the water of 0.04 g/cm² or more and 0.4 g/cm² or less, wherein

the cooling body is disposed in the main body portion such

that at least a part of the cooling body comes directly or indirectly in contact with the eyes and/or the areas around the eyes of the wearer when worn,

the cooling tool contains menthol, and

a value obtained by multiplying the initial content of the water [g/cm^2] by an initial content of the menthol [mg/cm^2] and by 1000 is 4 or more and 40 or less.

[0126]

<2>

The cooling tool according to <1>, wherein

the cooling tool has the initial content of the menthol of $0.02 \text{ mg}/\text{cm}^2$ or more and $0.35 \text{ mg}/\text{cm}^2$ or less, preferably $0.04 \text{ mg}/\text{cm}^2$ or more and $0.2 \text{ mg}/\text{cm}^2$ or less, and more preferably $0.06 \text{ mg}/\text{cm}^2$ or more and $0.12 \text{ mg}/\text{cm}^2$ or less.

<3>

The cooling tool according to <1> or <2>, wherein

the cooling body has a water-retentive material that is capable of absorbing water, and

the cooling body has a content of the water-retentive material of $5 \text{ mg}/\text{cm}^2$ or more and $20 \text{ mg}/\text{cm}^2$ or less, preferably $8 \text{ mg}/\text{cm}^2$ or more and $17 \text{ mg}/\text{cm}^2$ or less, and more preferably $10 \text{ mg}/\text{cm}^2$ or more and $13 \text{ mg}/\text{cm}^2$ or less.

<4>

The cooling tool according to any one of <1> to <3>, wherein

the water retention layer has an initial content of the water of 1 mass% or more and 20 mass% or less, preferably 2 mass% or more and 15 mass% or less, more preferably 3 mass% or more

and 10 mass% or less, and further preferably 4 mass% or more and 7 mass% or less of a maximum amount of water absorption of the water retention layer.

<5>

The cooling tool according to any one of <1> to <4>, wherein

the cooling tool has a total content of water of 2 g or more and 20 g or less, preferably 4 g or more and 16 g or less, and more preferably 6 g or more and 10 g less.

<6>

The cooling tool according to any one of <1> to <5>, wherein

the cooling tool has a total content of menthol of 0.9 mg or more and 17 mg or less, preferably 1.9 mg or more and 10 mg or less, and more preferably 2.8 mg or more and 6 mg or less.

[0127]

<7>

The cooling tool according to any one of <1> to <6>, wherein

the water retention layer has the initial content of the water of 0.04 g/cm² or more and 0.4 g/cm² or less, more preferably 0.08 g/cm² or more and 0.21 g/cm² or less, and further more preferably 0.1 g/cm² or more and 0.15 g/cm² or less.

<8>

The cooling tool according to any one of <1> to <7>, wherein

the water retention layer has the initial content of the water of 0.2 g/cm² or more and 0.4 g/cm² or less, and

the cooling tool has the initial content of the menthol of 0.02 mg/cm^2 or more and 0.06 mg/cm^2 or less.

<9>

The cooling tool according to any one of <1> to <8>, wherein

the water retention layer has the initial content of the water of 0.04 g/cm^2 or more and 0.1 g/cm^2 or less, and

the cooling tool has the initial content of the menthol of 0.2 mg/cm^2 or more and 0.35 mg/cm^2 or less.

<10>

The cooling tool according to any one of <1> to <9>, wherein

the water retention layer has the initial content of the water of 0.1 g/cm^2 or more and 0.18 g/cm^2 or less, and

the cooling tool has the initial content of the menthol of 0.06 mg/cm^2 or more and 0.24 mg/cm^2 or less.

[0128]

<11>

The cooling tool according to any one of <1> to <10>, wherein

the cooling body has an amount of water vapor emission to an eye-facing side of the wearer released in 60 minutes from a start of water vapor emission of $2.5 \text{ mg}/(\text{cm}^2 \cdot \text{hour})$ or more, preferably $5.0 \text{ mg}/(\text{cm}^2 \cdot \text{hour})$ or more, and more preferably $7.5 \text{ mg}/(\text{cm}^2 \cdot \text{hour})$ or more.

<12>

The cooling tool according to any one of <1> to <11>, wherein

the cooling body has the amount of water vapor emission to the eye-facing side of the wearer released in 60 minutes from the start of water vapor emission of $30 \text{ mg}(\text{cm}^2 \cdot \text{hour})$ or less, preferably $20 \text{ mg}(\text{cm}^2 \cdot \text{hour})$ or less, and more preferably $15 \text{ mg}(\text{cm}^2 \cdot \text{hour})$ or less.

<13>

The cooling tool according to any one of <1> to <12>, wherein

the cooling tool has a menthol volatilization volume to the eye-facing side of the wearer released in 60 minutes from a start of menthol volatilization of $0.01 \text{ } \mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or more, preferably $0.1 \text{ } \mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or more, and more preferably $0.5 \text{ } \mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or more.

<14>

The cooling tool according to any one of <1> to <13>, wherein

the cooling tool has the menthol volatilization volume to the eye-facing side of the wearer released in 60 minutes from the start of menthol volatilization of $1000 \text{ } \mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or less, preferably $100 \text{ } \mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or less, and more preferably $50 \text{ } \mu\text{g}/(\text{cm}^2 \cdot \text{hour})$ or less.

[0129]

<15>

The cooling tool according to any one of <1> to <14>, wherein

the main body portion includes:

an inner sheet that faces a skin side of the wearer when worn; and

an outer sheet disposed so as to face the inner sheet via the cooling body, wherein

the cooling body is arranged in the main body portion such that at least a part of the cooling body comes in contact with the eyes and/or the areas around the eyes of the wearer via the inner sheet when worn.

<16>

The cooling tool according to <15>, wherein the inner sheet has air permeability.

<17>

The cooling tool according to <16>, wherein the inner sheet has air permeability rate in a region between at least the eyes of the wearer and the water retention layer of 30000 seconds/100 mL or less, preferably 3000 seconds/100 mL or less, more preferably 300 seconds/100 mL or less, more preferably 200 seconds/100 mL or less, further preferably 100 seconds/100 mL or less, further more preferably 5 seconds/100 mL or less, and most preferably 0 seconds/100 mL.

[0130]

<18>

The cooling tool according to any one of <15> to <17>, wherein

the inner sheet has a moisture permeability.

<19>

The cooling tool according to <18>, wherein the inner sheet has the moisture permeability in the region between at least the eyes of the wearer and the water retention layer of 12000 g/m²·24 hr or less, preferably 11000

g/m²·24 hr or less, and more preferably 10000 g/m²·24 hr or less.

<20>

The cooling tool according to <18> or <19>, wherein the inner sheet has the moisture permeability in the region between at least the eyes of the wearer and the water retention layer of 2000 g/m²·24 hr or more, preferably 2500 g/m²·24 hr or more, and more preferably 3000 g/m²·24 hr or more.

<21>

The cooling tool according to any one of <15> to <20>, wherein

the inner sheet has a waterproof performance.

<22>

The cooling tool according to <21>, wherein

the inner sheet has a water resistance level in the region between at least the eyes of the wearer and the water retention layer of 300 mm or more, preferably 400 mm or more, is more preferably 500 mm or more, and further preferably 1000 mm.

[0131]

<23>

The cooling tool according to any one of <15> to <22>, wherein

a material of the inner sheet is one type or two or more types selected from one type or two or more types of fiber sheets selected from a nonwoven fabric, a woven fabric, and a paper, a resin foam sheet, and a metal sheet.

<24>

The cooling tool according to any one of <15> to <23>, wherein

the material of the inner sheet is the nonwoven fabric.

<25>

The cooling tool according to any one of <15> to <24>, wherein

the material of the inner sheet is a hydrophilic nonwoven fabric.

<26>

The cooling tool according to <25>, wherein

the hydrophilic nonwoven fabric is a nonwoven fabric with hydrophilicity of 1% or more.

[0132]

<27>

The cooling tool according to any one of <15> to <26>, wherein

the outer sheet has a low-air permeability or non-air permeability.

<28>

The cooling tool according to any one of <15> to <27>, wherein

the outer sheet has a low-moisture permeability or non-moisture permeability.

<29>

The cooling tool according to any one of <1> to <28>, wherein

the cooling body includes:

a first sheet disposed on an eye-facing side of a wearer; and

a second sheet disposed so as to face the first sheet

via at least the water retention layer.

<30>

The cooling tool according to <29>, wherein the first sheet has an air permeability.

<31>

The cooling tool according to <30>, wherein the first sheet has the air permeability rate in the region between at least the eyes of the wearer and the water retention layer of 350 seconds/100 mL or less, and preferably 100 seconds/100 mL or less.

[0133]

<32>

The cooling tool according to any one of <29> to <31>, wherein the first sheet has a moisture permeability.

<33>

The cooling tool according to <32>, wherein the first sheet has the moisture permeability in the region between at least the eyes of the wearer and the water retention layer of 12000 g/m²·24 hr or less, preferably 11000 g/m²·24 hr or less, more preferably 10000 g/m²·24 hr or less, and further more preferably 8000 g/m²·24 hr or less.

<34>

The cooling tool according to <32> or <33>, wherein the first sheet has the moisture permeability in the region between at least the eyes of the wearer and the water retention layer of 2000 g/m²·24 hr or more, preferably 2500 g/m²·24 hr or more, and more preferably 3000 g/m²·24 hr or more.

<35>

The cooling tool according to any one of <29> to <34>, wherein

the first sheet has a waterproof performance.

<36>

The cooling tool according to <35>, wherein

the first sheet has a water resistance level in the region between at least the eyes of the wearer and the water retention layer of 300 mm or more, preferably 400 mm or more, more preferably 500 mm or more, and further more preferably 1000 mm or more.

[0134]

<37>

The cooling tool according to any one of <29> to <36>, wherein

the second sheet has a low-air permeability and non-air permeability.

<38>

The cooling tool according to any one of <29> to <37>, wherein

the second sheet has a low-moisture permeability or non-moisture permeability.

Examples

[0135]

While the following specifically describes the present invention based on examples, these do not limit the object of the present invention.

[0136]

[Examples 1 to 6 and Comparative Examples 1 to 3]

In accordance with the following procedures, the cooling tools according to Examples 1 to 6 and Comparative Examples 1 to 3 were manufactured. The manufacturing conditions of Examples 1 to 6 and Comparative Examples 1 to 3 are similar except that the initial contents of the water and the initial contents of the menthol are different.

[0137]

[Manufacturing of Cooling Body]

Two cooling bodies 20 illustrated in FIG. 3 and FIG. 4 were manufactured such that the initial content of the water and the initial content of the menthol measured the values illustrated in Table 1. A 24 cm² MEGC21 (basis weight 32 g/m², manufactured by NITTOKU CO., LTD.) was used for the base material layer 21, and a polymer sheet (basis weight 120, PS-120PHC, manufactured by Inogami Co., Ltd.) formed by laminating a water-absorbent polymer (sodium polyacrylate, spherical shape, average particle diameter 300 μm, basis weight 70 g/m², AQUALIC CA, manufactured by NIPPON SHOKUBAI CO., LTD.) and a wood pulp paper (manufactured by Inogami Co., Ltd.) was used for the water-retentive material. Water was added in the water-absorbent polymer, and the water retention layer 22 was obtained.

[0138]

A 40 cm² BREATHRON (BRN-503) (air permeability rate 50 seconds/100 mL, manufactured by Nitoms, Inc.) was used for the first sheet 23, and a 40 cm² LF-KIPE-P71 (non-air permeable, basis weight 71 g/m², manufactured by Inogami Co., Ltd.) was

used for the second sheet 24. A synthetic fragrance containing 27.5 mass% menthol was directly applied on the second sheet 24, and thus, the second sheet 24 was perfumed with the menthol.
[0139]

[Manufacturing of Cooling Tool]

Using the two manufactured cooling bodies 20, the cooling tool 1 illustrated in FIG. 1 and FIG. 2 was manufactured. A 137 cm² NW-PRPW025 (air permeable, basis weight 25 g/m², manufactured by PT Multi Spunindo Jaya) was used for the inner sheet 11, and 137 cm² NW-PRBPW052-YE (non-air permeable, basis weight 50 g/m², manufactured by Yoshimoto Printing Co., Ltd.) was used for the outer sheet 12. A 112 cm² ELAXUS F0501-C1 (basis weight 50 g/m², manufactured by Golden Phoenix Fiberwebs Inc.) was used for the ear straps 30.

[0140]

[Test 1]

Two specialized panelists wore each cooling tool according to Examples 1 to 6 and Comparative Examples 1 to 3 for 20 minutes, and evaluated the coolness felt when wearing in accordance with the following evaluation criteria.

[0141]

[Evaluation Criteria of Comfortable Coolness]

5: Feel stimulation

4: Feel comfortable coolness, but feel slightly strong refreshing sensation

3: Nice balance of cooling sensation and refreshing sensation, and feel comfortable coolness

2: Feel comfortable coolness, but feel slightly strong cooling

sensation

1: Feel no coolness

[0142]

[Table 1]

	Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Comparative Example 1	Comparative Example 2	Comparative Example 3
Initial content of water [g/cm ³]	0.04	0.12	0.4	0.2	0.15	0.17	0.04	0.12	0.29
Initial content of menthol [mg/cm ³]	0.35	0.06	0.02	0.02	0.15	0.23	0.03	0.03	0.14
Initial content of water [g/cm ³] × Initial content of menthol [mg/cm ³] × 1000	14	7.2	8	4	23	39	1.2	3	41
Comfortable coolness	4	3	2	2	3	3	1	1	5

[0143]

[Evaluation of Test 1]

With Example 1, the refreshing sensation was slightly strongly felt, but a comfortable coolness was felt. With Examples 2, 5, and 6, the cooling sensation and the refreshing sensation were appropriately felt, and a comfortable coolness was felt. With Examples 3 and 4, while a slightly strong cooling sensation was felt at the beginning of wearing the cooling tool, a slightly weak refreshing sensation was felt thereafter, and a comfortable coolness was felt. Comparative Examples 1 and 2 had a weak cooling sensation and refreshing sensation, and no coolness was felt. Comparative Example 3 had a strong cooling sensation and refreshing sensation, and a stimulation was felt.

[0144]

[Examples 7 and 8]

Cooling tools according to Examples 7 and 8 were manufactured similarly to Example 1 except that a hydrophilic nonwoven fabric was used as the material of the inner sheet 11. Note that, in Example 7, a nonwoven fabric (SD2-30S,

manufactured by Daiwabo Co., Ltd.) formed from rayon was used for the hydrophilic nonwoven fabric. On the other hand, in Example 8, a nonwoven fabric (NW-QF181, manufactured by Kao Corporation) using fibers on which a hydrophilic oiling agent was applied was used for the hydrophilic nonwoven fabric.

[0145]

[Test 2]

Two specialized panelists wore each cooling tool according to Examples 1, 7, and 8 for 20 minutes, and evaluated a cold sensation felt when wearing in accordance with the following evaluation criteria.

[0146]

[Evaluation Criteria of Cold Sensation]

5: Presence of excessively strong cold sensation to extent of feeling pain

4: Presence of sufficiently strong cold sensation

3: Presence of cold sensation of extent between evaluation criteria 4 and evaluation criteria 2

2: Presence of weak cold sensation

1: No cold sensation

[0147]

[Table 2]

	Example 1	Example 7	Example 8
Initial content of water [g/cm ²]	0.04	0.04	0.04
Initial content of menthol [mg/cm ²]	0.35	0.35	0.35
Initial content of water [g/cm ²] × Initial content of menthol [mg/cm ²] × 1000	14	14	14
Cold sensation	3	4	4

[0148]

[Evaluation of Test 2]

Example 7 moistly contained water, and therefore, heat removal was felt at the moment of contact, and the period it took until the refreshing sensation from the menthol was felt was perceived quickly, and a sufficiently strong cold sensation was felt overall throughout the wearing. While not as moist as Example 7, Example 8 was moister than Example 1, which contributed the cold sensation from the beginning of the wearing, and the second strong cold sensation was felt following Example 7 overall throughout the wearing.

DESCRIPTION OF REFERENCE NUMERAL

[0149]

- 1 Cooling tool
- 10 Main body portion
- 10A First panel portion
- 10B Second panel portion
- 11 Inner sheet
- 12 Outer sheet
- 13 Upper edge portion
- 14 Lower edge portion
- 15 Upper-side slit
- 16 Lower-side slit
- 20 Cooling body
- 21 Base material layer
- 22 Water retention layer
- 23 First sheet

24	Second sheet
30	Ear strap
31	Ear strap main body
31a	Upper side
31b	Lower side
31c	Free edge
31d	Bonded edge
32	Ear strap hole
40	Measurement device
41	Measurement chamber
42	Inflow passage
43	Outflow passage
44	Inlet thermohygrometer
45	Inlet flowmeter
46	Outlet thermohygrometer
47	Outlet flowmeter
48	Thermometer
50	Bonded portion
60	Measurement device
61	Pump
62	Container
63	Funnel
64	First hose
65	Second hose
100	Vertical center line
200	Packaging body

Claims

Claim 1. A cooling tool comprising:

a main body portion that covers at least eyes and/or areas around the eyes on a face of a wearer; and

a cooling body disposed in the main body portion, wherein the cooling body includes a water retention layer that retains water,

the water retention layer has an initial content of the water of 0.04 g/cm^2 or more and 0.4 g/cm^2 or less, wherein

the cooling body is disposed in the main body portion such that at least a part of the cooling body comes directly or indirectly in contact with the eyes and/or the areas around the eyes of the wearer when worn,

the cooling tool contains menthol, and

a value obtained by multiplying the initial content of the water [g/cm^2] by an initial content of the menthol [mg/cm^2] and by 1000 is 4 or more and 40 or less.

Claim 2. The cooling tool according to claim 1, wherein

the cooling tool has the initial content of the menthol of 0.02 mg/cm^2 or more and 0.35 mg/cm^2 or less.

Claim 3. The cooling tool according to claim 1 or 2, wherein

the cooling body has a water-retentive material that is capable of absorbing water, and

the cooling body has a content of the water-retentive material of 5 mg/cm^2 or more and 20 mg/cm^2 or less.

Claim 4. The cooling tool according to any one of claims 1 to 3, wherein

the water retention layer has an initial content of water of 1 mass% or more and 20 mass% or less of a maximum amount of water absorption of the water retention layer.

Claim 5. The cooling tool according to any one of claims 1 to 4, wherein

the cooling tool has a total content of water of 2 g or more and 20 g or less.

Claim 6. The cooling tool according to any one of claims 1 to 5, wherein

the cooling tool has a total content of menthol of 0.9 mg or more and 17 mg or less.