

SPECIFICATION

Wet Wiper

BACKGROUND OF THE INVENTION

Technical Field

5 The present invention relates to a wet wiper.

Background Art

 As the aging society is moving ahead in recent years, the senior who
needs to be cared for are increasing in number. Moreover, some people, even if
they are not senior, are obliged to be bedridden due to illness, accident, or the
10 like.

 Conventionally, when the bodies of these people are wiped, wet towels,
wet tissues for moist hand towels, and wet tissues for babies have been used.
Such wet tissues are mainly nonwoven fabric or water-degradable sheets
impregnated with an impregnant for cleaning, and components with a high
15 cleaning effect and wiping materials impregnated with them have been
developed up to now. For example, the invention relating to the Japanese
Patent Laid-Open No. 1991-16542 proposes wiping materials including a
solvent for making them soluble in the impregnant such as paraoxybenzoate
ester having antibacterial and antifungal properties, propylene glycol and 1,
20 3-butylene glycol. Moreover, the invention relating to the Japanese Patent
Laid-Open No. 1992-183472 proposes a fungicidal-disinfectant aromatic agent
including ethanol as an antibacterial and antifungal agent. Thus, the impregnant
included in the conventional tissues are excellent in removing dirt.

 However, the impregnant included in conventional wet tissues includes
25 ethanol as an impregnant, and sebum, which serves as a barrier to protect the
skin at the time of wiping, is removed. Then, the part from which the sebum has
been removed becomes easily infected with miscellaneous bacteria. For

example, in the case of wet tissues including ethanol, although the ethanol functions as a disinfectant, it causes such a situation as the part becomes easily infected with external bacteria. Further, since the conventional wet tissues as mentioned above do not include a moisturizing agent at all or a sufficient quantity of the moisturizing agent, they may roughen the skin of the senior which is prone to become dry.

Further, the conventional wet tissues do not include a component having a function to remove keratin, which has become old and hard, without damaging the skin. Therefore, in order to remove the old keratin as waste matters of the skin, it is necessary to wipe them off strongly, and this can harm the surface of the skin.

Namely, the conventional wet tissues remove more sebum than before their use depending on the way of the use, thereby causing a drier skin, but the conventional wet tissues do not sufficiently moisturize the skin. Further, the conventional wet tissues have not been capable of removing the waste matters of the skin without harming the surface of the skin.

In order to solve such problems as mentioned above, the Japanese Patent Laid-Open No. 2002-209788 proposes a wet wiper which includes a plant extract having a moisturizing function and is suitable for use in nursing and care. However, the plant extract can only keep the skin surface wet, and cannot give moisture up to the keratinous layer. Moreover, the senior have a problem that the keratinous layer gets thicker because their skin is not normally metabolized, and therefore, the skin gets rough. However, this wet wiper does not include a component for improving such a trouble.

Disclosure of the invention

The present invention has been made considering the problems as

described above, and the object is to provide a wet wiper for letting the old keratinous layer peel off the skin, stimulating new keratinous cells to grow, preventing the skin from getting dry, and giving moisture to the skin.

In order to achieve the objects as mentioned above, the wet wiper in accordance with the present invention is characterized in that the impregnant includes a keratin-softening component, a moisturizing component, and a plant extract.

To be more specific, the present invention provides the following;

(1) A wet wiper formed of a sheet including a liquid-absorbing fiber and an impregnant liquid impregnated in the fiber, wherein the impregnant liquid includes a keratin-softening component, a moisturizing factor, and a plant extract.

According to the invention described in (1), the impregnant liquid is characterized by "including the keratin-softening component, the moisturizing factor and the plant extract".

The keratin-softening component has an effect of normalizing the metabolism of the skin by penetrating into the old and hard keratinous layer, dissolving the bondings among keratin, and stimulating the keratin to peel off.

The moisturizing factor includes a moisturizing component which is originally included in the keratin of the human skin, and has a function of preserving the moisture within the keratinous layer. The seniors are deficient in the moisturizing factor, and this causes the decrease of moisture in the skin. Therefore, it is possible to maintain the moisture in the keratinous layer and improve the dryness of the skin by applying the moisturizing factor.

The plant extract is an effective component extracted from a plant. Among the plant extract, some have a moisturizing effect, some have a convergent effect, and others have a deodorizing effect.

When using the one having the moisturizing effect, the skin is given the moisturizing effect when the skin is wiped. However, the plant extract without the moisturizing effect may be used.

According to the present invention, it is possible to stimulate metabolism
5 of the skin, moisturize the skin, and improve dry and rough skin that is often seen in the senior, by including the keratin-softening component, the moisturizing factor, and the plant extract in the wet wiper.

(2) A wet wiper as described in (1), wherein the keratin-softening component include α -hydroxy acid.

10 According to the invention (2) described above, "the keratin-softening component includes α -hydroxy acid", and therefore, the component can prevent rough skin by dissolving old and thick keratin, stimulating the keratin to peel off, and normalizing the metabolism of the skin. As the keratin-softening component, urea, cocis semen, etc. are considered other than α -hydroxy acid,
15 however, α -hydroxy acid is a naturally generated acid, and is nutritive to cells and acts to the skin mildly. Therefore, α -hydroxy acid is preferably used in the present invention.

(3) A wet wiper as described in (1) or (2), wherein said α -hydroxy acid includes at least one species selected from the group consisting of malic acid,
20 citric acid, and lactic acid.

According to the invention (3) described above, "the α -hydroxy acid includes at least one species selected from the group consisting of malic acid, citric acid, and lactic acid", therefore, the rough skin can be prevented by dissolving old and hard keratin, stimulating the keratin to peel off, and
25 normalizing metabolism of the skin.

(4) A wet wiper as described in any one from (1) to (3), wherein the moisturizing factor includes at least one species selected from the group

consisting of pyrrolidone carboxylate, urea, uric acid, amino acid, oligopeptide, and a lactate salt.

According to the invention (4) described above, "the moisturizing factor includes at least one species selected from the group consisting of pyrrolidone carboxylate, urea, uric acid, amino acid, oligopeptide, and a lactate salt", and therefore, moisture in the keratinous layer is maintained and can moisten the skin.

(5) A wet wiper as described in any one from (1) to (4), wherein the plant extract has moisturizing function.

According to the invention (5) described above, "the plant extract has moisturizing function", and therefore, it is able to moisten the skin upon wiping. As a result, the skin can be prevented from being dried.

(6) A wet wiper as described in any one from (1) to (4), wherein the plant extract includes at least one species selected from the group consisting of a sponge gourd extract, a yellow bark extract, a Houttuynia cordata extract, a hinokithiol extract, and a camomile extract.

According to the invention (6) described above, "the plant extract includes at least one species selected from the group consisting of a sponge gourd extract, a yellow bark extract, a houttuynia cordata extract, a hinokithiol extract, and a camomile extract", and therefore, it is able to moisturize the skin upon wiping. As a result, the skin can be prevented from being dried.

(7) A wet wiper as described in any one from (1) to (6), characterized in that the impregnant liquid includes an alcohol component, and the alcohol component consists essentially of poly-alcohol.

According to the invention (7) described above, "the alcohol component consists essentially of poly-alcohol", and therefore, ethanol is not included in the alcohol component. Therefore, the impregnant can prevent the skin of the

senior from being stimulated and decreased in moisturizing effect.

Lower alcohol is very stimulative to the skin and is a factor of damaging the skin. Therefore, according to the present invention, a wet wiper suitable for the skin of the senior can be obtained by restricting the alcohol component to poly-alcohol.

(8) A wet wiper as described in any one from (1) to (7), wherein the plant extract is extracted from poly-alcohol, and the poly-alcohol includes at least one species selected from the group consisting of 1, 3-butylene glycol, propylene glycol, and glycerin.

According to the invention (8) described above, "the plant extract is extracted from poly-alcohol, and the poly-alcohol includes at least one species selected from the group consisting of 1, 3-butylene glycol, propylene glycol, and glycerin", and therefore, the plant extract can prevent the skin of the senior from being stimulated and decreased in moisturizing effect.

(9) A wet wiper as described in any one from (1) to (8), wherein the impregnant liquid includes a pH adjusting agent, and pH of the impregnant liquid is not less than 3 and not more than 6.

According to the invention (9) described above, the invention is characterized in that "the impregnant liquid includes a pH adjusting agent, and pH of the impregnant liquid is not less than 3 and not more than 6". The pH of the skin is kept weakly acidic. Therefore, a coating on the skin is preferred to be weakly acidic. According to the present invention, the impregnant liquid can maintain the skin at the intrinsic pH of the skin, and can decrease stimulus to the skin of the senior and persons having weak skin.

Incidentally, the pH adjusting agent is preferably at least one selected from sodium lactate, sodium maleate, potassium hydroxide, and sodium citrate.

(10) A wet wiper as described in any one from (1) to (9), wherein rayon

and/or cotton are mixed in the sheet.

According to the invention (10) described above, "rayon and/or cotton are mixed in the sheet", and therefore, a soft and comfortable wet wiper, which is harmless to the skin of hands and face of a person to be cared for and further
5 the skin of a care worker, can be obtained from the sheet.

The rayon and cotton are fibers having such properties that water absorbs sufficiently and that the feeling is friendly to the skin. According to the present invention, since both rayon and cotton or either of them are/is mixed in the sheet, a wet wiper harmless to the skin of a person to be cared for and that
10 of a care worker can be obtained.

(11) A wet wiper as described in any one from (1) to (10), wherein the sheet has a specific weight per unit of 30 to 70 g/m².

According to the invention (11) described above, the wet wiper is characterized in that "the sheet has a specific weight per unit area of 30 to 70
15 g/m²". When a specific weight per unit area is less than 30 g/m², the sheet becomes too thin to hinder smooth wiping. Also, when a specific weight per unit area exceeds 70 g/m², the sheet is too thick to be easily folded, and causes hindrance in wiping detailed parts. According to the present invention, the sheet has a specific weight per unit area weight of 30 to 70 g/m², which is the easiest
20 thickness for the use.

(12) A wet wiper as described in any one from (1) to (10), wherein the sheet is a nonwoven fabric.

According to the invention (12) described above, the wet wiper is characterized in that "the sheet is a nonwoven fabric".

25 The nonwoven fabric is a cloth which is made not by a method of knitting or weaving, but is made cloth-like in the form of fibers as they are. Any kind of fibers can be used for the nonwoven fabric, and also, it can be freely made so

as to be dense and porous, soft and hard, as well as thin and thick. Moreover, the nonwoven fabric can be provided with a function such as liquid absorption property and water-repellent property according to its application. Therefore, according to the present invention, a wet wiper which has liquid absorption
5 property, and is also thick and soft, and further easy to use, can be obtained.

(13) A wet wiper as described in any one from (1) to (12), wherein the wet wiper is used for nursing and/or care.

According to the invention (13) described above, since "the wet wiper is used for nursing and/or care", a wet wiper which is easy to use for both a
10 person to perform nursing and/or care and a person to be nursed can be obtained.

Conventionally, a wet wiper especially for the use of nursing and caring has not been developed, and a care worker and a nurse used a wet wiper for general use or for babies. Therefore, there has been a problem that the wet
15 wiper did not sufficiently keep moisture and that it made the skin rough and dry after use. The wet wiper in accordance with the present invention is made mainly fit for the skin characteristic of the senior, and therefore, it can be made easy to use for both a nurse or a care worker and a person cared for.

(14) A wet wiper as described in any one from (1) to (13), wherein the
20 moisturizing factor includes a natural moisturizing factor.

According to the invention (14) described above, "the moisturizing factor includes a natural moisturizing factor", and therefore, dry skin can be improved by preserving the moisture of the keratinous layer by applying the moisturizing factor thereto.

25 The "natural moisturizing factor" is a moisturizing component which exists in the keratin of human skin by nature, and acts to prevent the moisture of the keratin from evaporating.

Definition of Terms

The "wet wiper" in accordance with the present invention means a sheet that includes a liquid-absorbing fiber and the impregnant liquid impregnated in the fiber. The wet wiper with the impregnant liquid is, for example, intended for
5 wiping, and includes a wet tissue, a wet towel, or the like.

The "keratin-softening component" relating to the present invention is a component which softens old and hard keratin, and this component, preferably, brings back the metabolism of skin into the normal state by stimulating the keratin to peel off. In the present invention, α -hydroxy acid is preferably used
10 as the keratin-softening component.

Moreover, the "moisturizing factor" means a moisturizing factor that exists in the human skin by nature, and normally acts to prevent the moisture of the keratinous layer from going away, and as the moisturizing factor decreases, the skin tends to get dry.

15 Also, the "plant extract" are essences extracted from plants, and in the present invention, a plant extract having moisturizing effect is preferably used among them.

Preferred Embodiments of the Invention

20 Next, preferred embodiments of the wet wiper in accordance with the present invention will be explained below. For the wet wiper of the present invention, a thick sheet having liquid absorption property and comprising a soft fiber is preferred for the use, and especially, a nonwoven fabric is preferred for the use. As a liquid absorbing fiber, a hydrophilic fiber is preferred for the use. A
25 hydrophilic fiber can be selected from fibers such as rayon, cotton, and pulp. Incidentally a fiber including both rayon and cotton may be used. Further, a synthetic fiber selected from hydrophilized polypropylene, polyester,

polyethylene, or the like can be blended as a liquid absorbing fiber. As the synthetic fiber, for example, a compound fiber that the core and sheath are polypropylene, or that the core is polypropylene and the sheath is polyethylene, can be used. Moreover, the fiber may be one formed from a single resin. As a hydrophobic fiber, a thermoplastic synthetic fiber such as polyethylene, polypropylene, polyamide, and polyester, and a compound fiber of these can be used.

As a fiber blending ratio of such nonwoven fabric, the hydrophilic fiber is preferred to be within the range of not less than 0.5 percent by weight and not more than 70 percent by weight. When a fiber blending ratio is not more than 0.5 percent by weight, a liquid content is too little to wipe the skin easily, and also the nonwoven fabric is stiff and not soft to the skin. Also, when a fiber blending ratio is more than 70 percent by weight, well-balanced blending becomes difficult in terms of productivity and cost. These fibers are maintained in a mode of the nonwoven fabric by being mechanically entangled with each other, being thermally welded, or being entangled and welded. Especially, when a soft and comfortable wet wiper is necessary, mechanically entangled fibers are preferred for the use.

Incidentally, such nonwoven fabric is preferred to have a specific weight per unit of 30 to 70 g/m², and preferably, it has 40 g/m² or more. When the specific weight per unit is less than 30 g/m², the sheet becomes too thin to wipe the skin smoothly, and when the specific weight per unit exceeds 70 g/m², the sheet becomes hard to be folded and causes difficulty in wiping detailed parts.

The wet wiper of the present invention can be obtained, for example, by impregnating the above-mentioned nonwoven fabric in an impregnant liquid including a keratin-softening component, a moisturizing component, and a plant extract.

As the keratin-softening component used for the present invention, it is preferred to use any one of malic acid, citric acid, and lactic acid. Such keratin-softening component is α -hydroxy acid having a carboxyl group and a hydroxyl group, and are generally called fruit acid. These kinds of fruit acid have an effect to normalize the metabolism of skin by penetrating an old and hard keratinous layer, dissolving the bonding among keratinous layer, and stimulating the keratin to peel off. The senior have a lower metabolic rate, and their keratinous layer becomes thick and hard, and the skin is getting dry and rough. Such a symptom can be improved by using the above-mentioned keratin-softening component. It is preferred that α -hydroxy acid has 1 to 10 carbon atoms, and is further preferred that α -hydroxy acid has 1 to 6 carbon atoms.

It is preferred that such keratin-softening component is contained at a ratio of 0.05 to 3.0 percent by weight to a total liquid quantity to be impregnated in the wet wiper.

As the moisturizing factor used for the present invention, for example, a pyrrolidone carboxylate salt, urea, uric acid, amino acid, oligopeptide, lactate, or the like can be mentioned, and especially, the pyrrolidone carboxylate salt is preferable. The reason is that the pyrrolidone carboxylate salt has a higher moisturizing effect than the other moisturizing factor.

A preferred pyrrolidone carboxylate salt is a salt consisting of pyrrolidone carboxylic acid and an inorganic base, and a salt consisting of pyrrolidone carboxylic acid and alkaline metal hydroxide is more preferable, and sodium pyrrolidone carboxylate (PCA-Na) is especially preferable for the use. PCA-Na is a moisture-absorb component contained in the keratinous layer of human skin, and a sodium salt of pyrrolidone carboxylate is one of the moisturizing factors for retaining moisture in the skin. The moisturizing factor is a component

which maybe extracted by water, and has a strong hygroscopic property, which retains moisture of skin. The above-mentioned PCA-Na absorbs and retains moisture on the skin upon contact with the skin, and is capable of making the skin moistened by this effect. Further, it is more preferred that the moisturizing factor is naturally derived.

Such moisturizing factor is preferably contained at a rate of 0.05 to 1.0 percent by weight of a total liquid quantity impregnated in the wet wiper. When the blending rate of the moisturizing factor is less than 0.05 percent by weight, a sufficient effect cannot be obtained to retain moisture of the skin.

As the plant extract used for the present invention, at least one species selected from, for example, a sponge gourd extract, a yellow bark extract, a *Houttuynia cordata* extract, a hinokithiol extract, and a camomile extract is preferred for the use. According to one embodiment of the present invention, only the plant extract with the moisturizing effect are used, and those without the moisturizing effect are not used. When these plant extracts are contained, they can provide the skin with the moisturizing effect when the skin is wiped. Moreover, when these plant extract are extracted, it is preferred to use at least one species of poly-alcohol consisting of 1, 3-butylene glycol, propylene glycol, and glycerin.

The plant extract as mentioned above are preferred to be contained at a rate of 0.02 to 5.0 percent by weight of a total liquid quantity impregnated in the wet wiper.

In an impregnant liquid of the wet wiper according to the present invention, a moisturizing agent, oil, a surface active agent, a pH adjusting agent, an anti-bacterial and anti-fungal agent, an oxidation inhibitor, a sequestering agent, a smell remover, an anti-inflammatory agent, a cooling agent, a fungicide, or the like can be mixed to the extent in which the purpose of the present

invention is not damaged.

It is preferable to use at least one species selected from polyethylene glycol and sodium hyaluronate as the moisturizing agent, and at least one species selected from olive oil, vaseline, and squalane as the oils.

5 A preferred content of such moisturizers is 0.1 to 5.0 percent by weight of a total liquid quantity impregnated in the wet wiper. However, especially, a mixing rate of the moisturizing agent less than 0.1 percent by weight is not preferred because a sufficient moisturizing effect may not be obtained in the range.

10 A preferred pH adjusting agent is at least one of those selected from, for example, sodium lactate, sodium malate, potassium hydroxide, and sodium citrate. Moreover, it is possible to adjust its pH to not less than 3 and not more than 6 to make the impregnant liquid weakly acidic through the composition of the above pH adjusting agent and reduce stimulus to the skin of the senior and
15 people having sensitive skin.

As the anti-bacterial and anti-fungal agents, paraoxybenzoate esters, cetyl pyridinium chloride, benzalkonium chloride, and a benzoate salt can be mentioned. Such anti-bacterial and anti-fungal agents can be added by a necessary quantity in order to prevent miscellaneous bacteria from propagating
20 in the rayon and cotton of the wet wiper mentioned above. Moreover, since paraoxybenzoate esters have poor water solubility, a solvent such as 1, 3-butyleneglycol, propylene glycol, glycerin, methanol, ethanol or the like which has good solubility to paraoxybenzoate esters is added thereto, and the mixture is adopted as an impregnant liquid of the wet wiper mentioned above. Further,
25 to reduce stimulus to the skin, monovalent alcohols such as methanol and ethanol are preferably excluded.

Incidentally, a proper quantity of the pH adjusting agents to be added to

the impregnant liquid mentioned above should be added thereto after all the other necessary solvents have been mixed, and the pH of the impregnant liquid is adjusted to a weakly acidic range of not less than 3 and not more than 6. The pH value is measured about at an ambient temperature.

5 The nonwoven fabric forming the wet wiper is impregnated with the above-mentioned impregnant liquid within the range of 150 to 300 percent by weight to a dry weight of the nonwoven fabric. When a liquid quantity of the impregnant is less than 150 percent by weight, it is impossible to sufficiently impregnate the entire thick nonwoven fabric, and the keratin-softening effect by
10 the above-mentioned plant extract, the moisturizing effect by the above-mentioned moisturizing factor, and the moisturizing effect by the above-mentioned plant extract cannot be sufficiently exerted the skin. Further, wiping effect of the wet wiper cannot be fully exerted. Moreover, when the quantity exceeds 300 percent by weight, the impregnant liquid is not completely
15 impregnated into the nonwoven fabric, and the skin gets too wet after being wiped, and the person whose skin was wiped feels uncomfortable, and it becomes easy for the person to get a rash if it is left.

Examples

20 In the following, the present invention will be explained in details by mentioning examples and comparative examples. Incidentally, the present invention is not restricted to these examples. The mixture quantities are expressed in percent by weight.

Examples 1 to 3 and comparative examples 1 to 7

25 In examples 1 to 3 and comparative examples 1 to 6, a nonwoven fabric was used, which was a blend of 45.0% of polyester fiber, 5.0% of polypropylene fiber, and 50.0% of rayon fiber, and which was manufactured by a spunlaced method so that the specific weight per unit was 38 g/m². Incidentally, only in the

comparative example 7, a nonwoven fabric including 50% of polyester and 50% of polypropylene, was used.

Concerning examples 1 to 3 and comparative examples 1 to 7, the wet wipers were obtained by impregnating the nonwoven fabrics with the
5 impregnant liquid of the mixture ratios shown in Table 1 and Table 2 so that the weight of the impregnant liquid was 2.5 times that of the above-mentioned nonwoven fabrics.

However, in Table 1 and Table 2, plant extract A, B, C, D, and E were extracted from sponge gourd, *Houttuynia cordata*, yellow bark, leaves of loquat,
10 and aloe, respectively, as the raw materials. The above-mentioned plant extract A was made by adding 300 gram of 1, 3-butylene glycol and 700 gram of purified water to 100 gram of the aboveground parts of dried sponge gourd, performing extraction at room temperature for 10 days while stirring them sometimes, and adding a solution of 30% 1, 3-butylene glycol thereto up to
15 1000 gram after filtration. Also, the above-mentioned extract B was extracted by cutting 100 gram of aboveground parts of *Houttuynia cordata* in the flowering period into pieces, adding 600 gram of 1, 3-butylene glycol and 600 gram of purified water thereto, and stirring them at room temperature. After extraction, the extract obtained by filtration was left standing still at 5°C for 10 days, and
20 was filtered again and added with a solution of 50% 1, 3-butylene glycol up to 1000 gram. Moreover, plant extract C of about 1000 gram was obtained by adding 1200 gram of 1, 3-butylene glycol to 200 gram of bark of yellow bark excluding the cuticles, performing extraction at room temperature while stirring them sometimes for 10 days and then filtering. The above-mentioned plant
25 extract D of about 900 gram of was obtained by adding 900 gram of 1, 3-butylene glycol and 100 gram of purified water to 100 gram powder of dried loquat leaves, performing extraction while stirring them sometimes at room

temperature for 10 days, and performing filtration. Moreover, the above-mentioned plant extract E of about 1000 gram was obtained by filtering and refining juice of leaves of aloe vera and its mutants, drying the juice to give 50 gram of powder, adding 550 gram of 1, 3-butylene glycol and 550 gram of purified water thereto, stirring them for 5 hours, standing them still for 10 days, and performing filtration.

Moreover, the plant extract F of about 1000 gram was obtained by adding 1200 gram of a mixture of ethanol (ethyl alcohol) and purified water (7 : 3) to 200 gram of yellow bark or bark of its other kindred excluding the cuticles, performing extraction while stirring them sometimes at room temperature for 10 days, and filtering them.

Moreover, the contents of respective plant extracts A, B, C, D, and E listed in Table 1 and Table 2 are the contents (percent by weight) of the plant extract liquids extracted with the above-mentioned 1, 3-butylene glycol, or 1, 3-butylen glycol and purified water. Also, the content of plant extract F means the content (percent by weight) of the plant extract liquid extracted with the above-mentioned ethyl alcohol and purified water.

Evaluation Method

Ease of Wiping

Wiping tests were carried out, by letting monitor care workers wipe the forearms of 20 monitors (to be cared for) assumed to be the bedridden senior. The above-mentioned persons to be cared for were asked whether they had a pain or a sense of incongruity when they had their skins wiped by the monitor care workers. In Table 1 and Table 2, the evaluation about ease of wiping was marked with circle ○ when all the monitor care workers and the persons to be cared for felt favorable, and was marked with cross X when even one of them did not feel favorable.

Skin-friendliness Test

Concerning the above-mentioned persons to be cared for, the states of the skins of the monitor persons to be cared for were visually observed immediately after the above tests. Also, the states of the skins after a period of three hours were visually observed. In Table 1 and Table 2, the evaluation was marked with circle ○ when rough skin and ruddiness were not particularly seen, and was marked with cross X when they were seen.

Velvet Feel of the Skin

Tests were carried out on the velvet feel of the skin by letting other monitor care workers different from those for the above tests use 40 sheets of wet wipers for another 30 monitor persons to be cared than those for above tests continuously for 5 days. The states of the skins of the monitor persons to be cared for were visually observed after 5 days from the start of the tests. The evaluation reference was marked with circle ○ when 15 or more in the numbers of monitor care workers replied that the skins were velvet, marked with triangle △ in the case of 5 to 14, and marked with cross X in the case of 5 or less.

The results are shown in Table 1 and Table 2. Plant extract A contains 1, 3-butylene glycol and the extract of sponge gourd. Plant extract B contains 1, 3-butylene glycol and the extract of *Houttuynia cordata*. Plant extract C contains 1, 3-butylene glycol and the extract of yellow bark. Plant extract D contains 1, 3-butylene glycol and the extract of loquat leaves. Plant extract E contains 1, 3-butylene glycol and the extract of aloe. Plant extract F contains ethanol and the extract of yellow bark.

Table 1

Example		1	2	3
Non-woven fabric	specific weight per unit (g/m ²)	38	38	38
	Presence or absence of rayon	present	present	present
Agents	Malic acid	0.10	3.00	0.05
	PCA -Na	0.20	1.00	0.05
	Plant extract A	0.02	0.2	0.02
	Plant extract B	0.02	0.2	0.02
	Plant extract C	0.02	0.02	0.02
	Plant extract D	0	0	0
	Plant extract E	0	0	0
	Plant extract F	0	0	0
	1, 3-butylene glycol	9	9	9
	Propylene glycol	0	0	0
	Glycerin	1.5	1.5	1.5
	Ethyl alcohol	0	0	0
	Trisodium citrate dihydrate	proper amount	proper amount	proper amount
	Parabens	0.38	0.38	0.38
	Purified water	rest	rest	rest
	pH	5.5	5.5	5.5
Evaluation	Ease of wiping	○	○	○
	Skin-friendliness	Immediately after	○	○
		In 3 hours	○	○
	Velvet feel of the skin	In 5 days	○	○

	Comp. Example	1	2	3	4	5	6	7
Non-woven fabric	a specific weight per unit (k/m ²)	38	38	38	38	38	38	38
	Presence or absence of rayon	present	present	present	present	present	present	present
Agents	Malic acid	0.10	0	0.10	0	0	0	0
	PCA-Na (50%aqueous solution)	0	0.20	0.20	0	0	0	0
	Plant extract A	0.02	0.02	0	0	0	0	0
	Plant extract B	0.02	0.02	0	0	0	0	0
	Plant extract C	0.02	0.02	0	0.02	0.5	0	1
	Plant extract D	0	0	0	0.02	0.5	0	1
	Plant extract E	0	0	0	0	0.2	0	1
	Plant extract F	0	0	0	0	0	2	0
	1, 3-butylene glycol	9	9	9	7.5	0	0	0
	Propylene glycol	0	0	0	0	5	5	5
	Glycerin	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Ethyl alcohol	0	0	0	0	0	0	0
	Trisodium citrate dihydrate	proper amount	proper amount	proper amount	proper amount	proper amount	proper amount	proper amount
	Parabens	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Purified water	rest	rest	rest	rest	rest	rest	rest
	pH	5.5	5.8	5.5	4.5	4.5	6.0	5.0
Evaluation	Ease of wiping	O	O	O	O	O	O	X
	Skin-friendliness	immediately after	O	O	O	O	X	O
		in 3 hours	O	O	O	O	X	O
	Velvet feel of the skin	in 5 hours	Δ	Δ	Δ	Δ	X	Δ

Table 2

The following is obvious from the results of Table 1. Namely, in examples, the wet wiper includes a liquid-absorbing rayon fiber, malic acid, PCA-Na and further includes a plant extract extracted with 1, 3-butylene glycol, and therefore, favorable results were obtained concerning any of the items regarding ease of wiping, skin-friendliness, and velvet feel of the skin.

Moreover, as examples 2 and 3 present, as well as in example 1, favorable evaluation was obtained on each test item of the above ease of wiping, skin-friendliness, and velvet feel of the skin also in the case that 0.05 to 2.0 percent by weight of malic acid, 0.05 to 1.0 percent by weight of PCA-Na, and each of plant extracts A, B, and C in the range of 0.02 to 0.2 percent by weight are contained the impregnant.

On the other hand, the results of Table 2 have shown that velvet feel of the skin is less evaluated in comparison example 1 compared with that of example 1, and that the moisturizing effect is not very high. Thus, it has proved that combination of only malic acid and the plant extract brings a low effect on velvet feel of the skin.

Also in comparative examples 2 and 3, the results show that combination of only PCA-Na and the plant extract, and combination of only malic acid and the plant extract bring less number of monitors who have realized velvet feel of the skin, compared with those Example 1, and are less effective to care the skin.

Further, in comparative examples 4 and 5, velvet feel of the skin was not realized compared with that of example 1. Therefore, it has been confirmed that the use of only the plant extract was not effective to velvet feel of the skin.

Also In comparative example 6, concerning the friendliness to the skin, both immediately after the use and after a period of 3 hours, deterioration of the skin was confirmed, and few people realized velvet feel of the skin. This was

because the extract extracted with ethyl alcohol, which is lower alcohol, was used and because ethyl alcohol was used as a solvent.

Moreover, in comparative example 7, the result was evaluated as hard-to-wipe compared with that of example 1. However, this was because a liquid-absorbing fiber was not included in the sheet, and therefore the sheet was not impregnated with the impregnant liquid.

Further, 250 percent by weight of the impregnant liquid of Example 1 shown in Table 1 was impregnated into the above-mentioned nonwoven fabric, to obtain the respective wet wiper. After the wet wiper was left in a constant temperature-and-humidity room at 20°C and relative humidity of 60%RH for 20 minutes, the insides of the forearms were wiped with the above-mentioned wet wiper ten times, and then, conductance of the skins was measured by a skin surface hydrometer (Model SKICON-200 manufactured by IBS Co., Ltd.) which was a high-frequency impedance measuring instrument. This conductance was indicated in units of μS (microsiemens), and the higher the value is, the more moistened the skin is. The results of the tests have shown that the conductance measured for 10 minutes after wiping the skins with the above-mentioned wet wipers was 61 μS showing a value five times as much as the value (12 μS) before starting the tests.

According to the present invention, a wet wiper impregnated with the impregnant liquid containing a keratin-softening component, a moisturizing factor, and a plant extract is capable of peeling an old keratinous layer, stimulating new keratinous cells to grow, preventing the skin from getting dry, and providing the skin with moisture.

What is claimed is:

1. A wet wiper formed of a sheet including a liquid-absorbing fiber and an impregnant liquid impregnated in said fiber, wherein said impregnant liquid includes a keratin-softening component, a moisturizing factor, and a plant extract.

2. A wet wiper as claimed in claim 1, wherein said a keratin-softening component include α -hydroxy acid.

3. A wet wiper as claimed in claim 1 or claim 2, wherein said α -hydroxy acid includes at least one species selected from the group consisting of malic acid, citric acid, and lactic acid.

4. A wet wiper as claimed in any one of claims 1 to 3, wherein said a moisturizing factor includes at least one species selected from the group consisting of pyrrolidone carboxylate, urea, uric acid, amino acid, oligopeptide, and lactate.

5. A wet wiper as claimed in any one of claims 1 to 4, wherein said a plant extract has moisturizing function.

6. A wet wiper as claimed in any one of claims 1 to 4, wherein said a plant extract include at least one species selected from the group consisting of a sponge gourd extract, a yellow bark extract, a Houttuynia cordata extract, a hlnokithiol extract, and a camomile extract.

7. A wet wiper as claimed in any one of claims 1 to 6, characterized in that said impregnant liquid includes an alcohol component, and said alcohol component consists essentially of poly-alcohol.

8. A wet wiper as claimed in any one of claims 1 to 7, wherein said a plant extract is extracted from poly-alcohol, and said poly-alcohol includes at least one species selected from the group consisting of 1, 3-butylene glycol, propylene glycol, and glycerin.

9. A wet wiper as claimed in any one of claims 1 to 8, wherein said impregnant liquid includes a pH adjusting agent, and pH of said impregnant liquid is not less than 3 and not more than 6.

5 10. A wet wiper as claimed in any one of claims 1 to 9, wherein rayon and/or cotton are mixed in said sheet.

11. A wet wiper as claimed in any one of claims 1 to 10, wherein said sheet has a specific weight per unit of 30 to 70 g/m².

12. A wet wiper as claimed in any one of claims 1 to 10, wherein said sheet is a nonwoven fabric.

10 13. A wet wiper as claimed in any one of claims 1 to 12, wherein the wet wiper is used for nursing and/or care.

14. A wet wiper as claimed in any one of claims 1 to 13, wherein said a moisturizing factor includes a natural moisturizing factor.