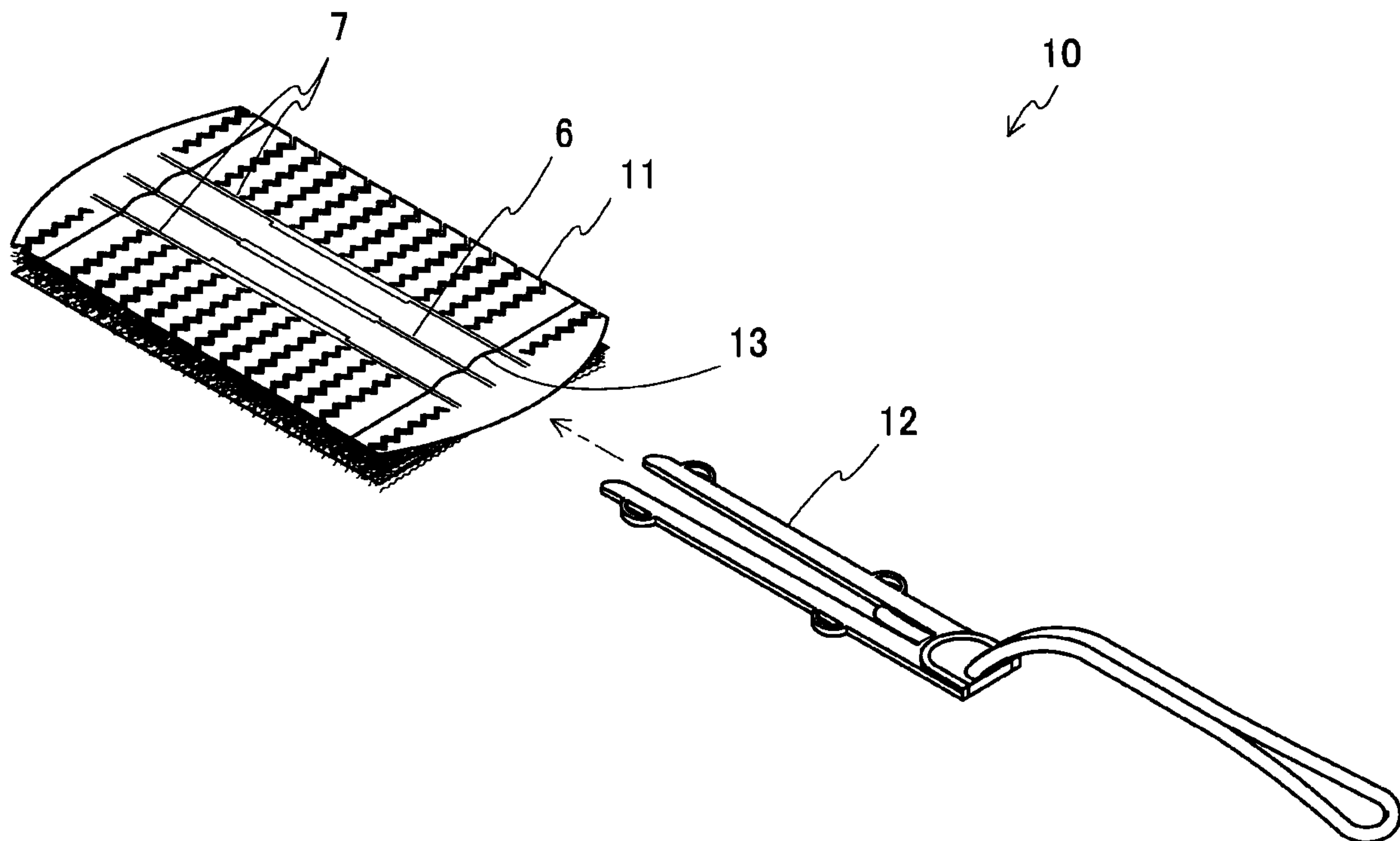




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(57) Abrégé/Abstract:

An indoor cleaning tool having a dry fibrous base material is provided. An antigenicity-reducing composition that includes an antigenicity-reducing component, a lubricant, and a surfactant is applied to the fibrous base material. Preferably, the antigenicity-reducing component is an extract of an olea or a ligustrum plant extracted with water or an organic solvent.

ABSTRACT

An indoor cleaning tool having a dry fibrous base material is provided.

An antigenicity-reducing composition that includes an antigenicity-reducing component, a lubricant, and a surfactant is applied to the fibrous base material.

- 5 Preferably, the antigenicity-reducing component is an extract of an olea or a ligustrum plant extracted with water or an organic solvent.

CLEANING TOOL

TECHNICAL FIELD

5

BACKGROUND ART

The present invention relates to an indoor cleaning tool equipped with a fibrous base material. More specifically, the present invention relates to a cleaning tool that can reduce the antigenicity of matter that can provoke allergies.

10

In recent years, there has been a steady increase in the number of people afflicted with allergic diseases such as allergic rhinitis and bronchial asthma. The matter that provokes these allergic diseases is referred to as allergens, of which already approximately 200 types have been discovered today. Mites, mite carcasses, pet hair, and pollen are typical examples. These can provoke various allergic reactions through contact with or entry into the body.

15

In these cases, using chemicals or the like to kill the mites and the like that provoke allergies does not provide a complete solution since the mite carcasses also have antigenicity. Thus, reducing allergic reactions and preventing new sensitivities from developing requires either completely removing allergens from the living space or reducing the antigenicity of matter that provokes allergies by denaturing allergens or the like.

20

Examples of an agent for reducing antigenicity of allergy-inducing matter as described above that have been disclosed include allergen inactivating agents made from *Olea europaea* and/or *Ligustrum obtusifolium* (Japanese laid-open patent publication number 2003-55122 -- Patent Document 1).

25

Also, there have been disclosed allergen-reducing agents formed as

agents that can be applied or dispersed in an aqueous state onto floors, carpets, and floor mats in the form of an aqueous solution containing aluminum sulfate and sodium sulfate as the active components as an example of an agent for reducing allergens (Japanese laid-open patent publication number 2003-
5 334240 -- Patent Document 2). With cleaning tools such as dust cloths, mops, and wipers used to remove indoor dust and particles, allergens become adhered to the cleaning tool during cleaning and stay on the cleaning tool for an extended time. As described above, reducing or preventing allergic reactions would require reducing the antigenicity of the allergens on the cleaning tool.

10 However, the agents in Patent Document 1 and 2 are all used by applying or dispersing them directly on places that can come into contact with the body, e.g., floor mats, carpets, floors, clothes. This makes it necessary to wipe away the agent or to remove it with a vacuum cleaner after application, resulting in a burden on the user. Easy elimination of allergy-inducing matter in
15 the cleaning of dust and particles on floors and furniture that are cleaned most often has not been investigated. Also, since the conventional methods moisten the object being cleaned, the object must then be dried. Dry cleaning methods for reducing allergy-inducing matter have not been proposed. Furthermore, no research has been done on reducing antigenicity of allergy-inducing matter
20 contained in dust and particles collected on dry cleaning tools such as mops.

More specifically, with indoor cleaning tools, disposable and replaceable dry tools equipped with fibrous base materials in sheet or brush form that contain essentially no moisture have been well-received in the market. With these dry cleaning tools, there is a need for the antigenicity-reducing
25 composition to be adhesive to and permeable in the fibrous base material, and the transfer of the composition to the object being cleaned must be minimal.

The Patent Document 1 does not take into account the adhesiveness or

the permeability of the composition. Also, the allergen-reducing agent in the Patent Document 2 is meant to be used as an aqueous fluid, i.e., in a "wet" state in order to reduce allergens, and is not easily applicable to a dry cleaning tool that contain essentially no moisture.

5

DISCLOSURE OF THE INVENTION

The object of the present invention is to overcome these problems and to provide a cleaning tool that can reduce the antigenicity of allergy-inducing matter adhered to the cleaning tool.

10 Based on careful research into overcoming the problems described above, the present inventors determined that the problems can be solved by applying an antigenicity-reducing component as a predetermined compound containing a lubricant and surfactant, resulting in the present invention. More specifically, the present invention provides the following.

15 (1) A cleaning tool for indoor cleaning comprising: a dry fibrous base material; and an antigenicity-reducing composition applied to said fibrous base material, wherein said antigenicity-reducing composition contains an antigenicity-reducing component for reducing antigenicity of allergy-inducing matter, a lubricant, and a surfactant.

20 Since the cleaning tool uses an antigenicity-reducing composition containing an antigenicity-reducing component reducing antigenicity of allergy-inducing matter, a lubricant, and a surfactant, this composition can be applied easily to a "dry-type" fibrous base material. Also, by applying the composition in this state, the antigenicity-reducing effect can be maintained in a stable manner
25 over a long period of time. Also, by applying less composition, transfer of the composition during cleaning from the fibrous base material to the object being cleaned can be prevented.

In the present invention, "dry-type" refers to the lubricant having a greater proportion by weight than the moisture in the antigenicity-reducing composition, and a proportion of 5.0% moisture or less would be appropriate. The moisture must be solubilized in the lubricant. If the lubricant is emulsified,
5 dust collection performance is reduced, making it undesirable.

(2) A cleaning tool as described in (1) wherein the antigenicity-reducing component is aqueous or hydrophilic. Also, (3) a cleaning tool as described in (1) or (2) wherein the antigenicity-reducing component is a plant extract component.

10 In these forms, the antigenicity-reducing component is aqueous or hydrophilic or is plant-derived, thus providing a high degree of human safety.

(4) A cleaning tool as described in any one of (1) through (3) wherein the antigenicity-reducing component is an extract from an olea or ligustrum plant extracted by using water or an organic solvent.

15 According to this, since extracts from an olea or ligustrum plant extracted by using water or an organic solvent (hereinafter referred to as olive extracts) provide superior antigenicity-reducing qualities, antigenicity can be reduced even through the application of small amounts. Also, some types of conventional plant-derived antigenicity-reducing components themselves have
20 color, thus leading to problems when application results in discoloring of the base material. However, since the olive extract itself is yellow to yellowish brown in color, it becomes almost transparent when it has been diluted and applied to the fibrous base material, thus preventing discoloring of the base material.

25 (5) A cleaning tool as described in any one of (1) through (4) wherein the antigenicity-reducing component is oleuropein.

The oleuropein used here is a phenolic iridoid glycoside found in large

quantities in olea and ligustrum plants. This iridoid glycoside contains a formyl group and hydroxy group, and it is believed that these bind with amino groups contained in the allergen protein to reduce antigenicity.

(6) A cleaning tool as described in any one of (1) through (5) wherein the
5 surfactant is a nonionic surfactant.

With this, the antigenicity-reducing component and lubricants can be mixed in a stable manner.

(7) A cleaning tool as described in any one of (1) through (6) wherein the lubricant is a dust-adhesive lubricant.

10 (8) A cleaning tool as described in any one of (1) through (7) wherein the lubricant is a mineral oil.

By using a dust-adhesive lubricant or a mineral oil as the lubricant, adhesion of the antigenicity-reducing composition to the fibrous base material is made easier. Also, disengagement of the antigenicity-reducing composition
15 from the fibrous base material to which it is applied and transfer to the object being cleaned can be effectively prevented. Also, dust collection is improved and dust is prevented from falling away once collected.

(9) A cleaning tool as described in (8) wherein the mineral oil has a viscosity of 10 to 200 mm²/s at 30 degrees C.

20 It would be preferable for the viscosity of the mineral oil to be from 10 to 200 mm²/s at 30 degrees C, and from 15 to 120 mm²/s more preferably. If the viscosity is less than 10 mm²/s, the composition may be transferred excessively to the object being cleaned and can adhere to hands, resulting in a sticky feeling. If the viscosity exceeds 200 mm²/s, dust adsorption is reduced.

25 (10) A cleaning tool as described in (4) or (5) wherein the fibrous base material is white.

With this, since the olive extract and oleuropein described above have

little coloring, there is no problem with the fibrous base material being discolored. As a result, since white fibrous base materials can be used as in the past, adhered dust and particles can be easily recognized.

(11) A cleaning tool as described in (1) to (10) wherein the antigenicity-
5 reducing component is from 0.01 to 10 percent by mass, the lubricant is from 50 to 95 percent by mass, and the surfactant is from 1 to 50 percent by mass relative to the entire antigenicity-reducing composition.

By using these ranges of proportions, dust can be collected using the dust-adhesive capabilities of the fibrous base material itself as well as the
10 lubricant. Furthermore, the antigenicity-reducing composition can reduce the antigenicity of allergy-inducing matter contained in the collected dust.

(12) A cleaning tool as described in (11) wherein the antigenicity-reducing composition is from 1 to 15 percent by mass relative to the entire fibrous base material to which the antigenicity-reducing composition is applied.

15 By having the antigenicity-reducing composition be at least 1 percent by mass relative to the entire fibrous base material, adequate antigenicity reduction can be provided. Since the proportion of antigenicity-reducing component that is added in this case would be 0.01 - 10 percent by mass, a suitable effect can be provided with a very small amount of the antigenicity-reducing component.

20 By having the antigenicity-reducing composition be 15 percent by mass or less relative to the entire fibrous base material, transfer of the antigenicity-reducing composition to the object being cleaned due to excessive adhesion of the antigenicity-reducing composition can be prevented.

(13) A cleaning tool as described in (11) wherein the antigenicity-
25 reducing composition is from 3 to 15 percent by mass relative to the entire fibrous base material to which the antigenicity-reducing composition is applied.

(14) A cleaning tool as described in (13) wherein at least a portion of the

antigenicity-reducing composition is transferred to the object being cleaned.

In the cleaning tools in (13) and (14), the antigenicity-reducing composition is at least 3% by mass relative to the entire fibrous base material. This provides an adequate antigenicity-reducing effect for the cleaning tool.

5 Also, by allowing at least a portion of the antigenicity-reducing composition to be transferred to the object being cleaned, it is possible to provide an antigenicity-reducing effect to the object being cleaned as well as to providing a waxing effect resulting from transfer of oil. By having the antigenicity-reducing composition be 15 percent by mass or less relative to the entire fibrous base
10 material, excessive transfer of the antigenicity-reducing composition to the object being cleaned due to excessive adhesion of the antigenicity-reducing composition can be prevented. Also, adhesion to the hands, resulting in a sensation of stickiness, can be prevented.

In this manner, the cleaning tools in (13) and (14) provide antigenicity
15 reduction for the cleaning tool, while also providing antigenicity reduction in the object being cleaned and further providing a waxing effect to the floor surface. Thus, the present invention can be used effectively in floor-type cleaning tools.

The present invention is able to provide a cleaning tool that can reduce the antigenicity of allergy-inducing matter adhered to the cleaning tool.

20 The above, and other objects, features and advantages of the present invention will become apparent from the following description read in conjunction with the accompanying drawings, in which like reference numerals designate the same elements.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective drawing showing an example of a cleaning tool according to the present invention.

Fig. 2 is an exploded perspective drawing of the fibrous base material in Fig. 1.

Fig. 3 is a perspective drawing showing another example of a cleaning tool according to the present invention.

5 Fig. 4 is a perspective drawing showing another example of a cleaning tool according to the present invention.

PREFERRED MODE FOR CARRYING OUT THE INVENTION

Antigenicity-reducing composition

10 The antigenicity-reducing composition applied to the cleaning tool of the present invention includes: (a) an antigenicity-reducing component that reduces the antigenicity of allergy-inducing matter; (b) a lubricant; and (c) a surfactant. These components will be described below.

Antigenicity-reducing component

15 The "antigenicity-reducing component" used in the present invention limits allergic reactions by reducing the antigenicity of allergy-inducing matter. It would be preferable for the component to be a plant-derivative component. The allergy-inducing matter (allergen) can be, e.g., inhaled allergens such as cedar pollen, grass pollen, mites, house dust, animals, fungi (mold), and insects.

20 There are no special restrictions on the specific antigenicity-reducing component used, but examples include olive extracts, privet extracts, and extracts from pomegranate, neem, persimmon, tea, bamboo, perilla, peppermint, Japanese Hinoki cypress (*Chamaecyparis obtusa*), Hiba arborvitae (*Thujopsis dolabrata*), eucalyptus, tea tree, and the like. Examples of extracted
25 compounds include: tannic acid, gallic acid, and the like. Other examples include: high molecular weight compounds in which a side chain of a linear high molecular weight repeating unit includes a phenol group that is monovalent or

higher such as poly (para-vinyl phenol); high molecular weight compounds in which a side chain of linear high molecular weight repeating units includes a phenol group that is monovalent such as dioxybenzoic acid polymer; a polyoxyethylene chain such as disodium lauryl diphenyl ether disulfonic acid
5 and/or a benzene sulfonate that is bivalent or higher and includes an ethylene chain in its molecule and/or a hydroxybenzoic acid such as a sulfate that is bivalent or higher and includes an ethylene chain in its molecule, a hydroxy benzoate such as 2,5-dihydroxy benzoate, or the like; an aromatic hydroxy compound; a carbonate of an alkali metal; alum; lauryl benzene sulfonic acid;
10 lauryl sulfate; polyoxyethylene lauryl ether sulfate; phosphate; zinc sulfate and/or lead acetate; and the like.

Of the components above, it would be preferable for the antigenicity-reducing component to be based on an olive extract. The "olive extract" of the present invention is extracted from an oleum or ligustrum plant using water or
15 an organic solvent. Also, it would be preferable for the antigenicity component to be oleuropein. Oleuropein is an iridoid glycoside. Iridoid glycosides can have a formyl group and a hydroxy group. It is believed that these bind with the amino group contained in the allergen protein to reduce antigenicity. A specific example of this type of olive extract is indicated in Patent Document 1 above.

20 Also, it is believed that tannic acid reduces antigenicity by the hydroxy group in polyphenol bonding with the amino group and the peptide section of the allergen protein.

The antigenicity-reducing components described above can be prepared as independent components or prepared in a solution (hereinafter referred to as
25 antigenicity-reducing agent) containing an active ingredient such as oleuropein, a fluid extract thereof, and the like. The olive extract described above is an example of an antigenicity-reducing agent. Besides oleuropein, it would also be

possible to use the extract as a compound containing ethanol and water.

Lubricant

The "lubricant" used in the present invention is added to increase adsorption and retention of dust and particles. There are no particular
5 restrictions on the type of lubricant, but it would be preferable to include at least one out of the following: mineral oil; silicone oil; and plant oil. Examples of mineral oil include paraffin-based hydrocarbons, naphthene-based hydrocarbons, and aromatic hydrocarbons. These lubricants can be used independently or two or more types can be mixed.

10 Of these, using liquid paraffin as the main component of the lubricant is preferable because it makes adhesion of the antigenicity-reducing component to the fibrous base material easier. Furthermore, once the antigenicity-reducing component is applied to the fibrous base material, the component is prevented from disengaging and getting caught in the object being cleaned.

15 Surfactant

The "surfactant" used in the present invention is added to allow easy application to the cleaning tool and to make the composition uniform. It would be preferable to use a nonionic surfactant. There are no special restrictions on the nonionic surfactants, but examples of preferable polyoxyethylene alkyl ether
20 include: polyoxyethylene lauryl ether; polyoxyethylene cetyl ether; polyoxyethylene oleyl ether; and polyoxyethylene stearyl ether. Examples of preferable sorbitan esters include: sorbitan laurate monoester; sorbitan monoester of palmitic acid; sorbitan monoester of stearic acid; and sorbitan monoester of oleic acid. Examples of preferable glycerine fatty acid esters
25 include: mono myristic acid glyceryl; mono stearic acid glyceryl; mono oleic acid glyceryl; mono isostearic acid glyceryl; and di oleic acid glyceryl. Examples of preferable vegetable oils include: jojoba oil; avocado oil; olive oil; persic oil;

grape seed oil; safflower oil; and sunflower oil. Examples of sorbitan trioleate include: sorbitan triester of stearic acid; and sorbitan triester of oleic acid. Examples of preferable ethylene oxide(EO) additives to castor oil or hydrogenated castor oil include: polyoxyethylene hydrogenated castor oil; lauric acid polyoxyethylene hydrogenated castor oil; and mono isostearic acid polyoxyethylene hydrogenated castor oil. These surfactants can be used independently or two or more types can be mixed.

Other components

Components other than the antigenicity-reducing compositions, lubricants, and surfactant described above can also be used in the antigenicity-reducing composition of the present invention as long as they do not significantly alter the characteristics of the composition.

Preparation of antigenicity-reducing composition

The components described above are mixed/agitated using conventional, known methods to form the antigenicity-reducing composition. The preferable proportions relative to the overall antigenicity-reducing composition of the three necessary components described above, i.e., the antigenicity-reducing component, the lubricant, and the surfactant, are as follows: in the range from 0.01 to 10 percent by mass of the antigenicity-reducing component; in the range from 50 to 95 percent by mass of the lubricant; and in the range of 1 to 50 percent by mass of the surfactant. More preferable is: in the range of 0.02 to 1 percent by mass of the antigenicity-reducing component; in the range of 60 to 80 percent by mass of the lubricant; and in the range of 20 to 40 percent by mass of the surfactant.

Using less than 0.01 percent by mass of the antigenicity-reducing component is not preferable since the antigenicity reduction for the collected particles is inadequate. A proportion greater than 10 percent by mass results in

instability over time in the antigenicity-reducing composition and also increases cost.

Using less than 50 percent by mass of the lubricant is not preferable since the lubricant provides inadequate improvement in the adhesion of dust and the like. A proportion greater than 95 percent by mass results in instability
5 over time in the antigenicity-reducing composition and is therefore not preferable.

Using less than 1 percent by mass of the surfactant is not preferable because of instability over time in the antigenicity-reducing composition. More
10 than 50 percent by mass reduces the amount of lubricant that can be added and is therefore not preferable.

Cleaning tool

Next, a cleaning tool to which the above antigenicity-reducing composition is applied will be described. There are no special restrictions on
15 the cleaning tool as long as it is a "dry-type" cleaning tool, i.e., an indoor cleaning tool having a fibrous base material that contains essentially no water. For example, the cleaning tool can be sheet-shaped or the sheet can be cut in strips, can be formed from multiple string-shaped elements such as in a mop, or can be tow fiber (a fiber assembly). There are also no special restrictions on
20 the fibrous base material, which can be formed from natural fiber, synthetic fiber, or semi-synthetic fiber. Also, there are no special restrictions on the form of the fiber, which can be woven, knitted, or nonwoven.

Examples of cleaning tools

Fig. 1 and Fig. 2 show an example of this type of cleaning tool. Fig. 1 is
25 a perspective drawing of the cleaning tool. Fig. 2 is an exploded perspective drawing of a cleaning sheet from Fig. 1. A cleaning tool 10 is a "handy-type" cleaning tool and is formed from: a cleaning sheet 11, which corresponds to the

fibrous base material of the present invention; and a grasping tool 12. The grasping tool 12 is interchangeable. For example, a grasping tool 22 shown in Fig. 3 can be mounted to allow the cleaning tool in Fig. 1 to be used in high places or narrow places that are difficult to reach.

5 As shown in Fig. 2, the cleaning sheet 11 is formed from the following layers, starting in sequence from the top: a retained sheet 1 formed from nonwoven cloth cut into multiple strips; a base sheet 2 also formed from nonwoven cloth cut into multiple strips; a first fiber bundle 3a formed from tow type fiber (i.e. a bulk of fiber); a second fiber bundle 3b formed from tow type
10 fiber; a third fiber bundle 3c formed from tow type fiber; a fourth fiber bundle 3d formed from tow type fiber; and a strip sheet 5 in which multiple strips are formed. In this embodiment, the first fiber bundle 3a, the second fiber bundle 3b, the third fiber bundle 3c, and the fourth fiber bundle 3d form the brush section of the present invention. Thus, this brush section provides more
15 effective cleaning. Since the antigenicity-reducing composition need only be applied to this brush section, the antigenicity-reducing composition can be applied more efficiently. The "brush section" referred to here is the section that performs the primary cleaning function in the cleaning tool of the present invention. The brush section can be a portion or all of the fibrous base material.
20 The retained sheet 1, the base material sheet 2, the first fiber bundle 3a, the second fiber bundle 3b, the third fiber bundle 3c, the fourth fiber bundle 3d, and the strip sheet 5 are all bonded together at a layer bonding line 6. At bonding lines 7, only the retained sheet 1, the base material sheet 2, the first fiber bundle 3a, and the second fiber bundle 3b are bonded. As a result, a holding space 13
25 is formed between the retained sheet 1 and the base material sheet 2, allowing the grasping tool 12 to be inserted and mounted. In this type of "handy-type" cleaning tool 10, 20, it would be preferable for the antigenicity-reducing

composition to be applied only to the brush section formed from the first fiber bundle 3a, the second fiber bundle 3b, the third fiber bundle 3c, and the fourth fiber bundle 3d.

Another example of a cleaning tool

5 Fig. 4 shows another example of a cleaning tool in the form of a floor-type cleaning tool 30 suitable for cleaning floors. As shown in Fig. 4, in this cleaning tool 30 a cleaning sheet 31 corresponding to the fiber base material of the present invention is wrapped around an end 32a of a grasping tool 32 and used. Projections 33 made from tows (aggregated fiber) are formed on the front
10 and back of the cleaning sheet 31. This makes it easier to clean places that would be difficult to clean with a flat tool, e.g., grooves. By simply placing the cleaning tool 30 in contact with a floor or the like, the cleaning sheet 31 is able to collect particles and the like. In this type of "floor-type" cleaning tool 30, it would be preferable to apply the antigenicity-reducing composition to the entire
15 cleaning sheet 31.

Application of antigenicity-reducing composition

 Examples of methods for applying the antigenicity-reducing composition to the cleaning tool described above include spraying or roller-coating the antigenicity-reducing composition onto the fibrous base material, immersion,
20 and the like, but the present invention is not restricted to these methods.

 In "handy-type" cleaning tool as shown in Fig. 1, it would be preferable to apply the antigenicity-reducing composition at 1 to 10% by weight relative to the entire fibrous base material. Applying less than 1% by weight is not preferable since it prevents dust particles from being completely retrieved. At more than
25 10% by weight, the composition is transferred excessively to the object being cleaned and also is transferred to the hands, resulting in a sensation of stickiness.

In floor-type cleaning tools as shown in Fig. 4, however, it would be preferable to apply slightly more composition, i.e., in the range from 3 to 15% by mass relative to the entire fibrous base material, and it would be more preferable to apply from 3 to 10% by weight. If the amount applied is within this range, it is easier for at least a portion of the antigenicity-reducing composition to be transferred to the object being cleaned. As a result, antigenicity reduction with the cleaning tool as described above is improved, while the antigenicity-reducing composition that has been transferred to and left on the object being cleaned is also able to reduce antigenicity. Thus, antigenicity reduction can be provided by the object being cleaned as well. Furthermore, since the oil in the antigenicity-reducing composition is transferred to the object being cleaned as well, waxing is provided for the floor surface. Thus, this arrangement can be suitable for floor-type cleaning tools. If the amount of composition applied is less than 3%, dust particles are not completely retrieved by the cleaning tool. Also, the transfer of the antigenicity-reducing composition to the object being cleaned is inadequate. If the amount applied is more than 15%, the transfer of the antigenicity-reducing composition to the object being cleaned is excessive. Also, the composition adheres to the hands and leads to a sensation of stickiness.

The present invention will be described in further detail using embodiments and comparative examples. The present invention, however, is not restricted to the embodiments described below.

Making the antigenicity-reducing agent containing the antigenicity-reducing component

Olive extract

Extraction is performed on the leaves of the olive plant using water, based on the third compound embodiment in Patent Document 1 (20 g of fresh

olive leaves placed in 100 g water, mixed in a mixer, then filtered). Then, ethanol to prepare 0.6% oleuropein.

Tannic acid

5 Tannic acid (from Wako Pure Chemical Industries, Ltd.) is dissolved in water and ethanol to prepare 15% tannic acid.

Making the antigenicity-reducing composition

Using the two types of antigenicity-reducing agents described above, production samples 1 - 4 of the antigenicity-reducing composition were prepared using the proportions shown in Table 1.

10 Liquid paraffin and/or safflower oil is used as the lubricant. For the surfactant, at least one of the following is used: polyoxyethylene alkyl ether, sorbitan monoester of oleic acid, mono isostearic acid glyceryl, sorbitan triester of oleic acid, and polyoxyethylene hydrogenated castor oil. In addition, water was mixed in and agitated to prepare the antigenicity-reducing composition.

Table 1

Amount of antigenicity-reducing composition (units: % by weight)

Name	Test sample	Polyoxyethylene alkyl ether	Sorbitan oleic acid monoester	Liquid paraffin	Water	Antigenicity-reducing component	Mono isostearic acid glyceryl	Safflower oil	Sorbitan oleic acid triester	Polyoxyethylene hydrogenated castor oil	Polyoxyethylene alkyl ether
		Note 2)		Note 3)		Note 1)				Note 4)	Note 5)
Standard lubricant	Production sample 4	0.8	1.2	98	-	-	-	-	-	-	-
Tannic acid composition	Production sample 1	0.8	2	92.6	0.2	0.1	1	-	0.8	1	1.5
	Production sample 2	0.7	4.8	74.4	0.2	3.9	4	2	3.5	2	4.5
Oleuropein composition	Production sample 3	0.7	7.5	78.3	0.2	3.9	-	-	7	-	2.4

Note 1) (Tannic acid): Tannic acid (Wako Pure Chemical Industries, Ltd.) was dissolved in water and ethanol to prepare 15% tannic acid.

Olive extract: Olive plant leaves are extracted with water based on the third composition embodiment in Patent Document 1. Ethanol is added to
5 prepare 0.6% oleuropein.

Note 2) The EO addition to the polyoxyethylene alkyl ether was 5 moles. The number of carbon atoms in the alkyl group is 12 - 14.

Note 3) 50 mm²/s viscosity at 30 degrees C.

Note 4) The EO addition to the polyoxyethylene hydrogenated castor oil
10 was 60 moles.

Note 5) The EO addition to the polyoxyethylene alkyl ether was 3 moles. The number of carbon atoms in the alkyl group is 12 - 14.

Application of the antigenicity-reducing composition to the cleaning tool

Next, the antigenicity-reducing composition production samples 1
15 through 3 and the composition production sample 4 are sprayed onto the cleaning tool shown in Fig. 1 (hereinafter referred to as the "handy-type"), and onto the cleaning tool shown in Fig. 4 (hereinafter referred to as the "floor-type"). For each type, a first through third cleaning tool embodiment (tools on which production samples 1 through 3 were applied) and a first comparative example
20 (tools on which the production sample 4 was applied) were obtained.

For the handy-type tools, 5 percent by mass was applied relative to the entire fibrous base material (the sheet 11 in Fig. 1). For the floor-type tools, 7.5 percent by mass of the antigenicity-reducing composition was applied relative to the entire fibrous base material (the sheet 31 in Fig. 4).

25 Evaluation

Evaluation 1: Evaluation of antigenicity-reducing performance

Antigenicity-reducing performance on cedar pollen and dust mites was

evaluated for the first, second, and third embodiments and the first comparative sample using the procedure described below. The results are shown in Tables 2 and 3. In the tables, the reduction rates are determined as $100 - 100 \times$ (allergen volume from a cleaning tool to which antigenicity-reducing agent was applied quantified using the ELISA method) / (allergen volume from a cleaning tool to which no antigenicity-reducing agent was applied quantified using the ELISA method). The symbols in the tables indicate the following reduction rates:

Circle: good reduction rate (50% or higher)

10 Triangle: inferior reduction rate (10 - 50%)

X: bad reduction rate (0 - 10%)

Handy-type: Debris containing approximately 0.05 g of mite allergens (dust mites) and approximately 0.01 g cedar pollen were placed in a glass bottle having a diameter of 9 cm and a height of 17 cm. The bottle was capped and the debris and cedar pollen were dispersed throughout the bottle. The top was removed and the handy-type cleaning tool was used to wipe away the debris and cedar pollen. An extraction fluid was used on the cleaning tool to extract the allergens and the allergens were quantified using the ELISA method.

Floor-type: Debris containing approximately 0.05 g of mite allergens (dust mites) and approximately 0.01 g cedar pollen were placed on a floor panel approximately 30 cm x 30 cm. The debris and the cedar pollen were wiped away with the floor-type cleaning tool. An extraction fluid was used on the cleaning tool to extract the allergens and the allergens were quantified using the ELISA method.

25 A phosphoric acid buffering agent (pH7) was used as the extraction fluid. Also, the ELISA method (enzyme-linked immunosorbent assay) is a type of quantification method (EIA: enzyme immunoassay) that uses enzyme color

formation that takes place in antigen-antibody reactions. Specifically, the Sandwich technique that uses two kinds of antibody which sandwiches the object to be detected to quantify was used.

Table 2

Cedar pollen antigenicity reduction rate

	Reduction rate	
Test sample	Hand-held	Floor
Comp. sample 1	×	×
Embodiment 1	Δ	Δ
Embodiment 2	○	○
Embodiment 3	○	○

Table 3

Mite antigenicity reduction rate

	Reduction rate	
Test sample	Hand-held	Floor
Comp. sample 1	×	×
Embodiment 1	×	Δ
Embodiment 2	○	○
Embodiment 3	○	○

5

Based on the results from Table 2 and Table 3, it was found that the floor-type cleaning tool provided reductions with each of the antigenicity-reducing compositions. In the handy-type cleaning tool of the first embodiment, however, not as much of the antigenicity-reducing component was applied and the effect was somewhat less.

10

Evaluation 2: Evaluation of reductions after exposure to heating and light

Heating test: For the cleaning tools in the second and third embodiment, the fibrous base material was placed by itself in a paper housing and covered for the handy-type cleaning tools and in a pillow-type covering made from film
5 for the floor-type cleaning tool. The packages were left indoors away from direct light, in a thermostatic chamber at 40 degrees C, and in a thermostatic chamber at 50 degrees C. Then, after one month, allergens were measured using the same method as in the Evaluation 1.

Light test: For the handy-type and floor-type cleaning tools, the sheets
10 were left unpackaged under a xenon lamp weather meter for the equivalent of one month under sunlight and six months under sunlight. Allergens were measured using the same method as in the Evaluation 1.

Results are shown in Table 4, with the reduction rates and symbols in the table indicating the same things as in Tables 2, 3. For both the cleaning tools of
15 the second and third embodiment, the reduction effect was maintained after exposure to heating for one month. The reduction effect was also maintained after exposure to sunlight.

Table 4

Mite antigenicity reduction rate

Condition	Elapsed time	Embodiment 2		Embodiment 3	
		Hand-held	Floor	Hand-held	Floor
Immediately after application	0 days	○	○	○	○
RT	One month	○	○	○	○
40 degrees C	One month	○	○	○	○
50 degrees C	One month	○	○	○	○
Light exposure	One month equivalent	○	○	○	○
Light exposure	Six months equivalent	○	-	○	-

The present invention is suitable for use as an indoor cleaning tool having a fibrous base material.

- 5 Having described preferred embodiments of the invention with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments, and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention as defined in the appended claims.

CLAIMS

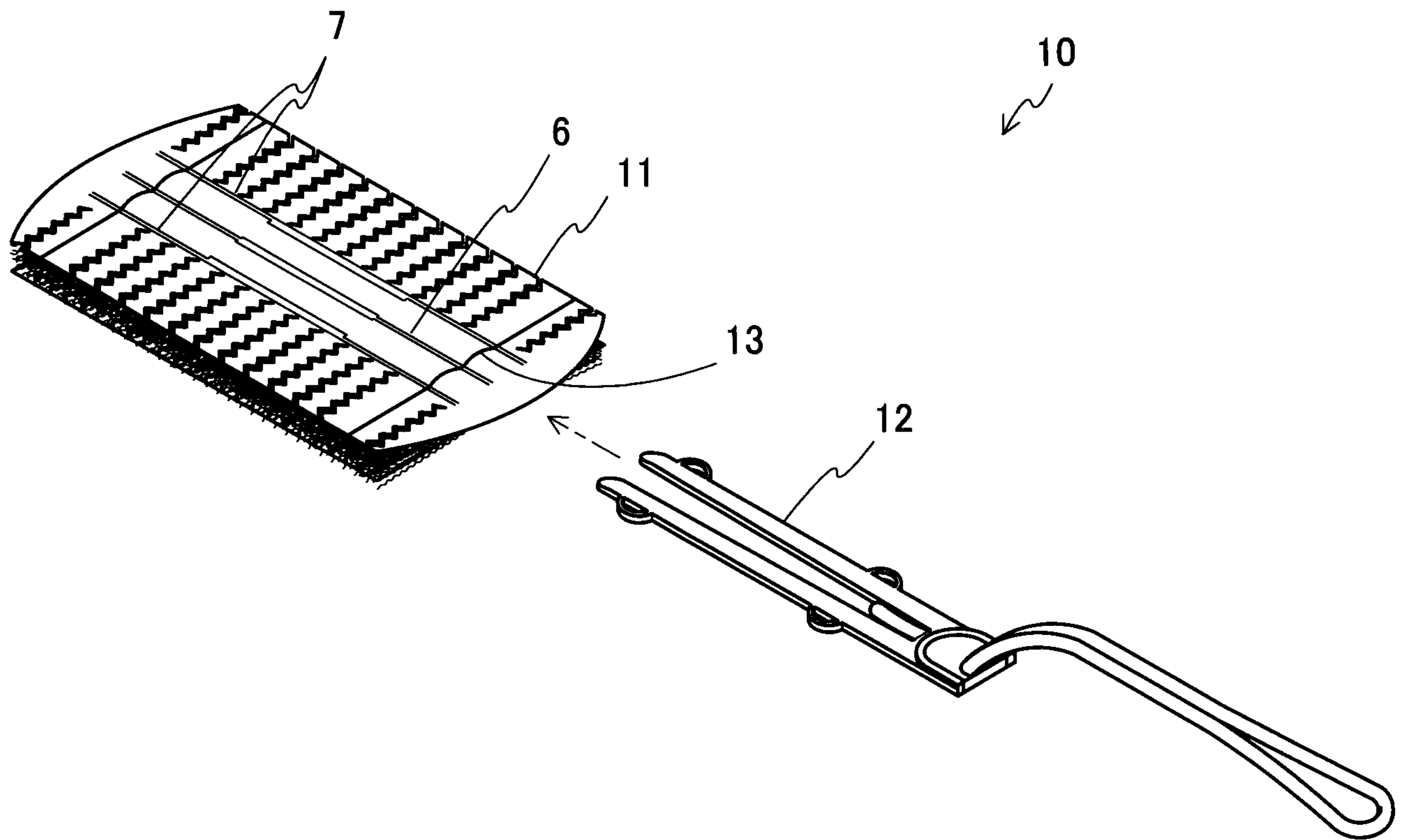
1. A cleaning tool for indoor cleaning comprising:
a dry fibrous base material; and
an antigenicity-reducing composition, applied to said fibrous base material, the antigenicity-reducing composition contains an antigenicity-reducing component for reducing antigenicity of allergy-inducing matter, a lubricant as a dust-adhesive lubricant and a surfactant,
wherein the antigenicity-reducing composition is 3 - 15 percent by mass relative to the entire fibrous base material to which the antigenicity-reducing composition is applied, so as to provide a waxing effect that the antigenicity-reducing composition is transferred with the lubricant to a object being cleaned.
2. A cleaning tool as described in claim 1 wherein said antigenicity-reducing component is aqueous or hydrophilic.
3. A cleaning tool as described in any one of claims 1 to 2 wherein said antigenicity-reducing component is a plant extract component.
4. A cleaning tool as described in any one of claims 1 to 3 wherein said antigenicity-reducing component is an extract from an olea or ligustrum plant extracted by using water or an organic solvent.
5. A cleaning tool as described in any one of claims 1 to 4 wherein said antigenicity-reducing component is oleuropein.
6. A cleaning tool as described in any one of claims 1 to 5 wherein said surfactant is a nonionic surfactant.

7. The cleaning tool as described in any one of claims 1 to 6 wherein the antigenicity-reducing composition is 7.5 percent by mass relative to the entire fibrous base material to which the antigenicity-reducing composition is applied.
8. A cleaning tool as described in any one of claims 1 to 7 wherein said lubricant is a mineral oil.
9. A cleaning tool as described in claim 8 wherein said mineral oil has a viscosity of 10-200 mm²/s at 30 deg C.
10. A cleaning tool as described in any one of claims 4 to 5 wherein said fibrous base material is white.
11. A cleaning tool as described in any one of claims 1 to 10 wherein said antigenicity-reducing component is 0.01-10 percent by mass, said lubricant is 50-95 percent by mass, and said surfactant is 1-50 percent by mass relative to the entire antigenicity-reducing composition.
12. The cleaning tool as described in any one of claims 1 to 11 wherein the fibrous base material includes a sheet member and a fiber bundle member formed from tow type fiber disposed on the fibrous base material.
13. The cleaning tool as described in any one of claims 1 to 11 wherein the fibrous base material includes a sheet member and a fiber bundle member formed from tow type fiber disposed on the fibrous base material, the fiber bundle member has tow projections in planar direction of the sheet member.
14. The cleaning tool as described in claim 1 wherein the antigenicity-reducing component includes oleuropein derived from an olive leaf extract and is achieved by adding ethanol to the extract to prepared a 0.6% oleuropein solution defining an antigenicity-reducing agent, adding at least water to the antigenicity-reducing agent to

prepare an antigenicity-reducing component dilute solution, and applying the antigenicity-reducing component dilute solution to the fibrous base material to obtain the antigenicity-reducing component.

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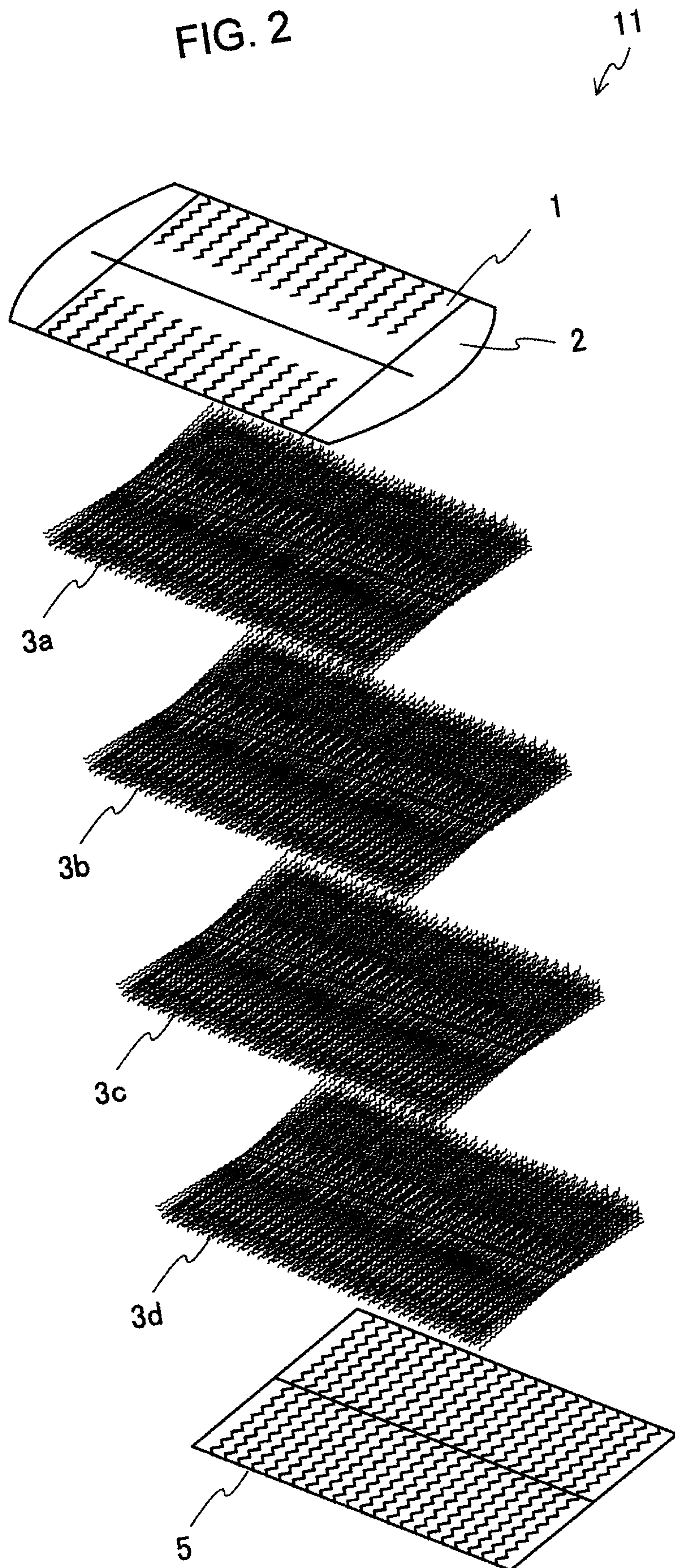
FIG. 1



YCF-077

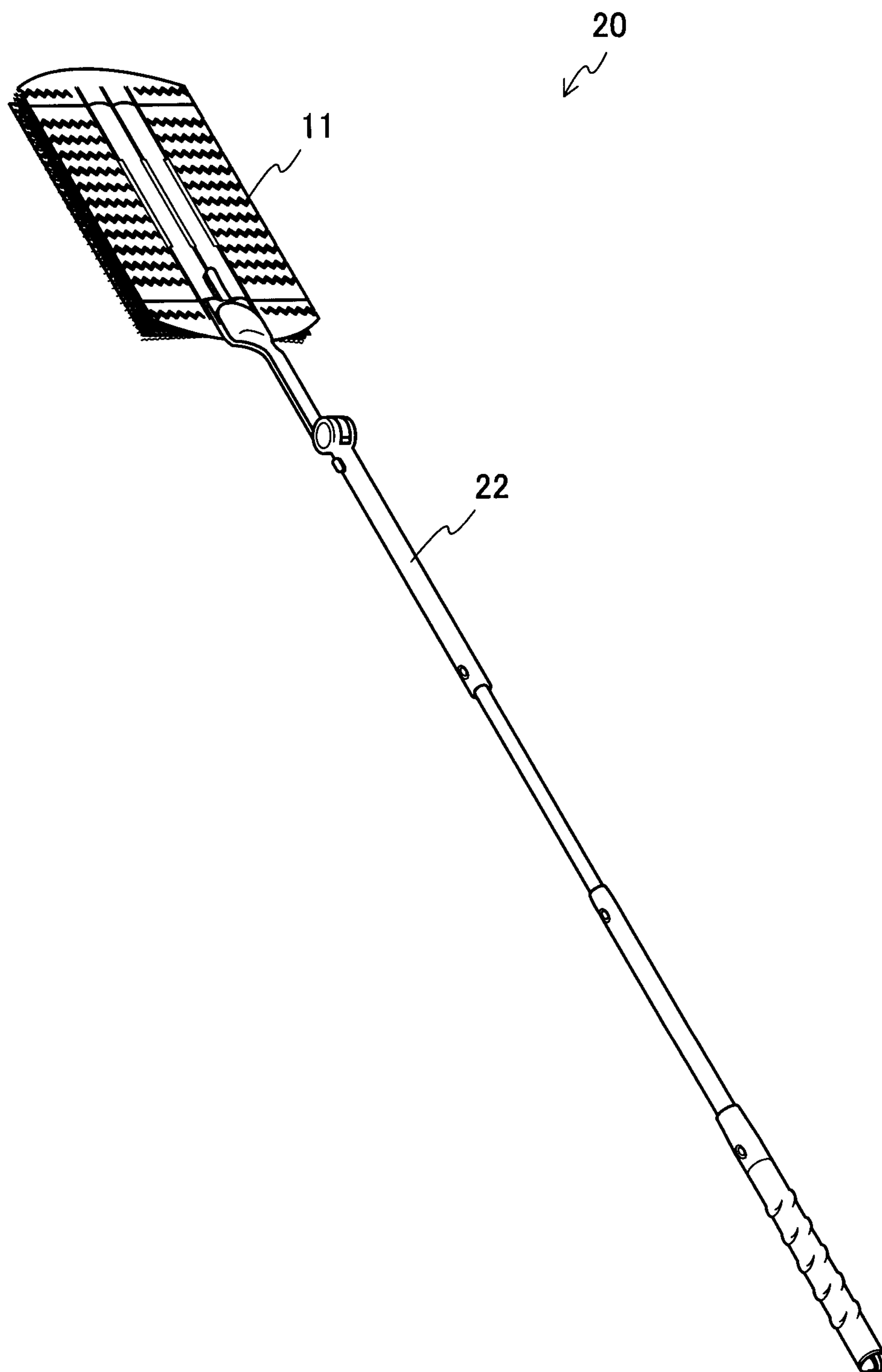
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FIG. 2



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FIG. 3



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FIG. 4

