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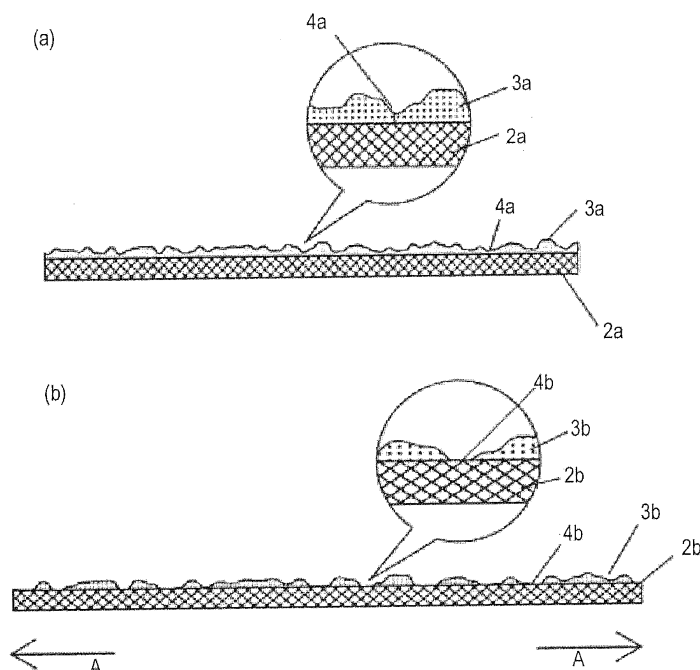
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(54) **GLOVE**

(57) The present invention provides a glove that can reduce a humid feeling during usage while realizing a grip force, usability, workability, and breathability. The glove of the present invention includes a hand-shaped base layer (2a, 2b) made of fibers having a stretching property, a coating (3a, 3b) formed on the surface of the

base layer (2a, 2b), at least on the surface of a palm of the base layer, and a plurality of breathing pores (4a, 4b) formed in the coating (3a, 3b), wherein the opening areas of the breathing pores (4b) when the glove is worn are larger than the opening areas of the breathing pores (4a) when the glove is not worn.

Fig. 5



Description

Background of the Invention

1. Field of the Invention

[0001] The present invention relates to a glove, and in particular to a glove with a coating which makes it easy to grasp an object and is grippy and which is intended to prevent water penetration, while being capable of preventing a hand from feeling humid due to the coating.

2. Description of the Related Art

[0002] Conventionally, a variety of gloves are used in different situations, such as manufacturing operation in a factory, agricultural work, gardening, light work, and construction operation. A glove achieves a high efficiency of work, as well as protecting a worker's hand. Here, gloves can be classified into a type of glove obtained by knitting fibers, such as a cotton work glove, and a type of glove made of rubber or resin mainly for the purpose of a waterproof property.

[0003] A glove obtained by knitting fibers, such as a cotton work glove, is excellent in breathability and workability, but has the problems that the glove is slippery when an object is grasped with the glove and that water easily infiltrates into the glove. On the other hand, a glove having a high waterproof property has the problem that breathability and workability are poor.

[0004] Under these circumstances, in order to achieve workability, breathability, prevention of feeling humid, and slip resistance, respectively, a glove is suggested whose part, which is part of the surface of a base layer obtained by knitting fibers and which is a palm part, is provided with a coating of resin or the like. The part covered with the coating is expected waterproof property to some extent, and a part which is not covered with the coating exerts breathability. In addition, since the material of the coating part is resin, rubber, or the like, the coating part can be expected to have a non-slip effect, thereby improving a gripping property. This is because it is made easy to grasp an object securely, since the material of the coating or the coating increases frictional force.

[0005] In a case where a worker works with such a glove on, however, in practice, the worker tends to sweat more and more easily feel humid on the palm part provided with the coating than on a palm back part which is not provided with the coating. In this case, since the palm part is covered with the coating, it is difficult to diffuse sweat or water generated on the palm. As a result, a condition under which it becomes easily humid occurs inside the glove, and the worker feels uncomfortable.

[0006] In addition, while the coating makes the glove grippy in relation to an object to be grasped, the problem occurs that inside the glove, water on the palm makes the glove slippery in relation to the hand or, on the other

hand, the glove becomes difficult to take off. As a result, the glove provided with the coating on the palm side has the problem that usability or workability becomes worse.

[0007] On the other hand, such a glove provided with the coating on part of the palm or the surface is used in a variety of situations. In using the glove in such situations, (1) slip resistance in grasping an object, (2) a certain waterproof property which can be expected externally in grasping an object, (3) a certain waterproof property expected in not using the glove, are expected to be achieved. If these requirements can be achieved, then a structure by which usability or workability is improved is required.

[0008] For this purpose, a technique for securing breathability while providing the coating has been suggested (for example, see Japanese Patent Application Laid-Open No. 2002-129418 and Japanese Patent Application Laid-Open No. 2007-84975). Alternatively, a technique for forming breathing pores in a glove when the coating is formed has been suggested (for example, see Japanese Patent Application Laid-Open No. H10-53908 and Japanese Patent Application Laid-Open No. 2001-131813). Furthermore, a technique for breathing pores due to rupture of air bubbles has been suggested (for example, see Japanese Patent Publication No. S63-58922 and National Publication of International Patent Application No. 2009-527658).

Patent Document 1: Japanese Patent Application Laid-Open No. 2002-129418

Patent Document 2: Japanese Patent Application Laid-Open No. 2007-84975

Patent Document 3: Japanese Patent Application Laid-Open No. H10-53908

Patent Document 4: Japanese Patent Application Laid-Open No. 2001-131813

Patent Document 5: Japanese Patent Publication No. S63-58922

Patent Document 6: National Publication of International Patent Application No. 2009-527658

SUMMARY OF INVENTION

[0009] Japanese Patent Application Laid-Open No. 2002-129418 discloses a glove whose breathability is secured by, after forming a sol-like resin layer, attaching discrete particles to the resin layer, and perforating the resin layer when removing the discrete particles. That is, the glove disclosed in Japanese Patent Application Laid-Open No. 2002-129418 satisfies both of an anti-slip or certain waterproof effect due to the resin layer and securing of breathability.

[0010] However, the glove disclosed in Japanese Patent Application Laid-Open No. 2002-129418 is provided to a worker with the resin layer perforated. When being provided in such a state, the glove has the problem that when the glove is not in use, water might penetrate the glove through the pores in the resin layer and damps the

inside of the glove. In addition, the glove disclosed in Japanese Patent Application Laid-Open No. 2002-129418 has the problem that since optimization of securing of breathability and how the inside of the glove get humid are not performed, workability, breathability, and usability for a worker to work with the glove on cannot be secured.

[0011] Japanese Patent Application Laid-Open No. 2007-84975 discloses a glove whose breathability is secured by coating with resin an unprocessed sewn or knitted supporting liner provided with fine protrusions.

[0012] Regarding the glove disclosed in Japanese Patent Application Laid-Open No. 2007-84975, however, a specific configuration of the breathing pores is not disclosed. Further, as in the case of the glove in Japanese Patent Application Laid-Open No. 2002-129418, a certain waterproof property when the glove is not in use is not considered. In addition, there is the problem that optimization of securing of breathability and how the inside of the glove get humid is not performed, workability, breathability, and usability for a worker to work with the glove on cannot be secured.

[0013] In addition, Japanese Patent Application Laid-Open No. H10-53908 and Japanese Patent Application Laid-Open No. 2001-131813 disclose techniques of rupturing air bubbles in a foamed resin coating to form breathing pores in the surface of a glove. These conventional techniques, however, do not disclose that a user wears the glove, thereby opening the breathing pores. Therefore, the gloves disclosed in Japanese Patent Application Laid-Open No. H10-53908 and Japanese Patent Application Laid-Open No. 2001-131813 cannot achieve both a certain waterproof property expected when the glove is not in use, and breathability when the glove is in use.

[0014] Japanese Patent Application Laid-Open No. 2001-131813 and Japanese Patent Publication No. S63-58922 disclose techniques of allowing ventilation through ruptured air bubbles. The techniques in Japanese Patent Application Laid-Open No. 2001-131813 and Japanese Patent Publication No. S63-58922, however, do not disclose that breathing pores are opened by wearing the glove, and the openings of the breathing pores are small when the glove is not worn.

[0015] As described above, regarding the gloves in the conventional techniques, it is disclosed that breathability is secured by forming breathing pores, but there is the problem that (1) a certain waterproof property expected when the glove is not in use and breathability when the glove is in use, (2) optimization of securing of breathability and how the inside of the glove get humid, (3) securing of usability of the glove, and the like, cannot be achieved.

[0016] In particular, in the case of work with use of a glove, the glove which is not worn might be left on a work table, so that in this situation there is the problem that water might penetrate the glove in the above situation. Once water penetrates the glove, the penetrating water causes an uncomfortable feeling when a user puts on

the glove. During wearing of the glove, sweat mainly on the palm causes an uncomfortable feeling. In consideration of conditions of use of a glove, it is important to secure breathability and usability obtained from the breathability in order not to impair the workability of the glove.

[0017] An object of the present invention is to provide a glove that can reduce a humid feeling when the glove is in use, while achieving grip force, usability, workability, and breathability.

Means for solving the Problem

[0018] Under these circumstances, a glove according to the present invention includes a hand-shaped base layer made of fibers having a stretching property, a coating formed on the surface of the base layer, at least the surface of a palm of the base layer, and a plurality of breathing pores formed in the coating, wherein the opening areas of the breathing pores when the glove is worn are larger than the opening areas of the breathing pores when the glove is not worn, and the base layer has a plurality of stitches so that the stitches and the breathing pores communicate with each other when the breathing pores are opened by wearing the glove.

Effect of the Invention

[0019] Since the glove according to the present invention has the coating layer formed on a part, including the palm side, of the glove, breathability can be secured by the breathing pores formed in the coating layer, with improved object grip force. Furthermore, since the breathing pores are expanded when the glove is worn, the glove is not easily penetrated by water when the glove is not worn, and breathability can be secured when the glove is worn. As a result, an uncomfortable feeling due to the externally penetrating water when the glove is worn is eliminated, and an uncomfortable feeling due to water, such as sweat on the palm, during wearing of the glove is reduced. That is, the glove can deal with both of the causes of uncomfortable feelings that might arise before and during wearing of the glove.

[0020] In addition, a wearer sweats on the palm or the bases of fingers more than on the other parts in the glove, and in the glove according to the present invention, the density or areas of the breathing pores in parts corresponding to such parts of a hand of the wearer is made high or large. As a result, a humid feeling during wearing of the glove and during working is reduced, and a difference in grip force between the inside and outside of the glove is reduced, so that the glove becomes difficult to take off.

[0021] In addition, if the breathing pores are differently formed according to respective parts of the glove, it becomes possible to maintain the durability of the glove while responding to breathability different from part to part. Furthermore, by applying an idea to coating forma-

tion parts variously, a humid feeling or an uncomfortable feeling can be reduced.

Brief Description of the Drawings

[0022]

FIG. 1 is a perspective view of a glove according to a first embodiment of the present invention;
 FIG. 2 is a perspective view of the glove according to the first embodiment of the present invention;
 FIGS. 3A and 3B are partially enlarged views of a coating according to the first embodiment of the present invention;
 FIG. 4 is a front view showing a relationship between a base and breathing pores of the glove according to the first embodiment;
 FIGS. 5A and 5B are descriptive views showing how the breathing pores expand according to the first embodiment of the present invention;
 FIG. 6 is a front view of a glove according to a second embodiment of the present invention;
 FIG. 7 is a front view of the glove according to the second embodiment of the present invention;
 FIGS. 8A and 8B are side views of a glove according to a third embodiment of the present invention;
 FIG. 9 is a descriptive view showing a process of manufacturing breathing pores 4 according to a fourth embodiment of the present invention;
 FIG. 10 is a front view of a glove according to a sixth embodiment of the present invention;
 FIG. 11 is a front view of the glove according to the sixth embodiment of the present invention;
 FIG. 12 is a front view of the glove according to the sixth embodiment of the present invention;
 FIG. 13 is a front view of the glove according to the sixth embodiment of the present invention; and
 FIG. 14 is a front view of the glove according to the sixth embodiment of the present invention.

Description of the Preferred Embodiments

[0023] A glove according to a first aspect of the present invention includes a hand-shaped base made of fibers having a stretching property, a coating formed on the surface of the base layer, at least the surface of a palm of the base layer, and a plurality of breathing pores formed in the coating, wherein the opening area of the breathing pores when the glove is worn is larger than the opening area of the breathing pores when the glove is not worn.

[0024] This configuration makes it possible to achieve breathability due to the breathing pores while securing high durability, gripping property, and a certain waterproof property due to the coating.

In a glove according to a second aspect of the present invention, in addition to the first aspect, the base layer has a plurality of stitches, and when the breathing pores

are opened by wearing the glove, the stitches and the breathing pores communicate with each other.

[0025] According to this configuration, it becomes possible to breathe air or exhaust air between the surface of a hand of a wearer and the outside of the glove.

[0026] In a glove according to a third aspect of the present invention, in addition to the second aspect, the total opening area of the plurality of stitches is larger than the total opening area of the plurality of breathing pores when the plurality of breathing pores are opened.

[0027] According to this configuration, the openings near a humid or damp surface of the hand becomes so large that the sweat or humidity on the surface of the hand is sufficiently exhausted.

[0028] In a glove according to a fourth aspect of the present invention, in addition to the second or third aspect, the opening area of one of the plurality of stitches is larger than the opening area of one of the plurality of breathing pores when the one of the plurality of breathing pores is opened.

[0029] According to this configuration, enlarges the openings near a humid or damp surface of the hand becomes so large that the sweat or humidity on the surface of the hand is sufficiently exhausted.

[0030] In a glove according to a fifth aspect of the present invention, in addition to any one of the second to fourth aspects, the total opening area of the stitches on a palm side of the glove is larger than the total opening area of the stitches on a palm back side of the glove.

[0031] According to this configuration, the humidity on the surface of the hand is sufficiently exhausted.

[0032] In a glove according to a sixth aspect of the present invention, in addition to any one of the first to fifth aspects, the coating is formed over substantially the whole surface of the base layer, or at least on a palm, a finger, and the base of a finger of the base layer in the surface of the base layer.

[0033] According to this configuration, the coating can increase the gripping property or ease in handling of the glove.

[0034] In a glove according to a seventh aspect of the present invention, in addition to any one of the first to sixth aspects, at least either one of the number of the breathing pores per unit area (hereinafter, called "unit number") of a plurality of breathing pores and the total opening area of the breathing pores per unit area (hereinafter, called "unit opening area") of a plurality of breathing pores differs according to respective parts of the glove.

[0035] According to this configuration, the breathing pores can enhance breathing air or exhausting air preferentially in a part where sweat or humidity easily collects. In addition, the durability of the glove is not reduced.

[0036] In a glove according to an eighth aspect of the present invention, in addition to the seventh aspect, at least either one of the unit number and the unit opening area in the base of the finger of the glove is more than or larger than at least either one of the unit number and

unit opening area in the palm of the glove.

[0037] According to this configuration, the breathing pores can preferentially breathe air or exhaust air at the base of the finger where sweat or humidity easily collects. In addition, the durability of the glove is not reduced.

[0038] In a glove according to a ninth aspect of the present invention, in addition to the seventh aspect, at least either one of the unit number and unit opening area in the finger of the glove is more than or larger than at least either one of the unit number or unit opening area in the palm of the glove.

[0039] According to this configuration, the breathing pores can preferentially breathe air or exhaust air in the finger whose shape is complicated. In addition, the durability of the glove is not reduced.

[0040] In a glove according to a tenth aspect of the present invention, in addition to the ninth aspect, the size of a finger of a former for manufacturing a glove is smaller than a standard size thereof, and the size of a palm of the former is equal to or larger than a standard size thereof.

[0041] According to this configuration, the unit number or unit opening area in the finger can be made more than or larger than the unit number or unit opening area in the palm.

[0042] In a glove according to an eleventh aspect of the present invention, in addition to the seventh aspect, at least either one of the unit number and the unit opening area in the finger of the glove is less than or smaller than at least either one of the unit number and the unit opening area in the palm of the glove.

[0043] According to this configuration, breathability or an air exhausting property can be performed preferentially in the palm whose surface area is large. Of course, the durability of the glove is not reduced.

[0044] In a glove according to a twelfth aspect of the present invention, in addition to the eleventh aspect, the size of the finger of a former for manufacturing a glove is equal to or larger than a standard size thereof, and the size of a palm of the former is smaller than a standard size thereof.

[0045] According to this configuration, the unit number or unit opening area in the palm can be made more than or larger than the unit number or unit opening area in the finger.

[0046] In a glove according to a thirteenth aspect of the present invention, in addition to any one of the first to twelfth aspects, the breathing pores are formed by at least either one of rupturing air bubbles contained in the coating and attaching particles to the coating.

[0047] According to this configuration, the breathing pores are easily formed.

[0048] In a glove according to a fourteenth aspect of the present invention, in addition to any one of the first to thirteenth aspects, the finger of the glove is in a bent state to the side of the palm when the glove is not worn.

[0049] According to this configuration, the breathing pores in the finger are easily opened wider than the

breathing pores in the palm.

[0050] In a glove according to a fifteenth aspect of the present invention, in addition to any one of the second to fourteenth aspects, at least one of the plurality of breathing pores communicates with more than one of the stitches when the glove is worn.

[0051] According to this configuration, the glove can increase the degree of breathability due to the breathing pores.

[0052] In a glove according to a sixteenth aspect of the present invention, in addition to any one of the second to fourteenth aspects, at least one of the plurality of stitches communicates with more than one of the breathing pores when the glove is worn.

[0053] According to this configuration, the glove can increase durability against deterioration of the coating due to expansion of the breathing pores while securing breathability.

[0054] In a glove according to a seventeenth aspect of the present invention, in addition to any one of the second to sixteenth aspects, the stitches are formed by knitting a reference yarn having a low stretching property and a yarn having a stretching property.

[0055] According to this configuration, it becomes easy for the stitches to keep their opening. As a result, breathability produced in communication with the breathing pores increases.

[0056] In a glove according to an eighteenth aspect of the present invention, in addition to the seventeenth aspect, the reference yarn includes bamboo fiber.

[0057] According to this configuration, the reference yarn can reduce the stretching property.

[0058] In a glove according to a nineteenth aspect of the present invention, in addition to any one of the first to eighteenth aspects, the coating is formed on the surfaces of the finger and the palm, excluding at least part of the base of the finger and a finger joint of the glove.

[0059] According to this configuration, breathability at a part in which sweat or water collects easily and which has less effect on gripping property.

[0060] In a glove according to a twentieth aspect of the present invention, in addition to any one of the first to nineteenth aspects, the thickness of the coating on the base of the fingers and the finger joint of the glove is thinner than the thickness of the coating on the finger and the palm of the glove.

[0061] According to this configuration, breathability at a part in which sweat or water collects easily and which has less effect on gripping property can be increased.

[0062] In a glove according to a twenty-first aspect of the present invention, in addition to any one of the first to nineteenth aspects, the thickness of the coating on the finger of the glove is thinner than the thickness of the coating on the palm.

[0063] According to this configuration, breathability of the finger where sweat or water is problematic can be increased by a simpler method.

[0064] In a glove according to a twenty-second aspect

of the present invention, in addition to any one of the first to nineteenth aspects, the thickness of the coating on a fingertip of the glove is thicker than the thickness of the coating on at least either one of the finger and the palm.

[0065] According to this configuration, the glove can increase the grip force of the fingertip.

[0066] In a glove according to a twenty-third aspect of the present invention, in addition to any one of the first to twenty-second aspects, the chromaticity of the base layer contains darker part than the chromaticity of the coating.

[0067] According to this configuration, the glove can make a user indirectly grasp the presence of the breathing pores or the openings thereof.

[0068] (First Embodiment)

[0069] A first embodiment will be described.

[0070] (Overall Summary)

[0071] First, the summary of a glove according to the first embodiment will be described with reference to FIGS. 1 to 4. The glove according to the first embodiment has a shape conforming with the shape of a human hand, and is used in a state where a user who is an ordinary human is wearing the glove on his/her hand.

[0072] FIG. 1 is a perspective view of the glove according to the first embodiment of the present invention. FIG. 1 shows a palm side view of a glove 1. FIG. 2 is a perspective view of the glove according to the first embodiment of the present invention. FIG. 2 shows a palm back side view of the glove 1, which is the opposite side from in FIG. 1.

[0073] The glove 1 includes a base layer 2, a coating 3 formed on a surface of the base layer 2, and a plurality of breathing pores 4 formed in the coating 3. The base layer 2 has the shape of a hand, and is made of fibers having a stretching property. The coating 3 is formed on the surface of the base layer 2, at least on the surface of a palm 5. It is preferred that the coating 3 has a waterproof property similar to that of resin, artificial leather or the like. The plurality of breathing pores 4 is located in the coating 3, though not visible in FIG. 1 or 2. The opening area of the breathing pores 4 when the glove 1 is worn is larger than the opening area of the breathing pores 4 when the glove 1 is not worn.

[0074] FIGS. 3A and 3B are partially enlarged views of the coating in the first embodiment of the present invention. FIG. 3A shows the state of the coating 3 when the glove 1 is not worn (that is, shows a state that the coating 3 is not stretched), and FIG. 3B shows the state of the coating 3 when the glove 1 is worn (that is, shows a state that the coating 3 is stretched by wearing of the glove 1). The coating 3 includes the plurality of breathing pores 4. These breathing pores 4 are irregularly shaped, and have various shapes.

[0075] In FIG. 3A, since the glove 1 is not worn, the base layer 2 and the coating 3 which form the glove 1 are each not stretched. Therefore, each of the plurality of breathing pores 4 included in the coating 3 is closed or slightly opened. On the other hand, in FIG. 3B, since

the glove 1 is worn, the base layer 2 and the coating 3 which form the glove 1 stretch along a hand on which the glove is worn, respectively. With this stretch, the opening area of each of the plurality of breathing pores 4 included in the coating 3 increases. The opening area of the breathing pore 4 shown in FIG. 3B is obviously larger than the opening area of the breathing pore 4 shown in FIG. 3A.

[0076] Thus, by inserting a user's hand into the glove 1, the base layer 2 having a stretching property expands. Since the coating 3 is attached to the surface of the base layer 2, the coating 3 also expands inevitably according to the expansion of the base layer 2. Due to this expansion, namely, stretch, of the coating 3, each of the plurality of breathing pores 4 included in the coating 3 increases its opening area.

[0077] Since the coating 3 is formed from a material having a waterproof property, such as resin or artificial leather, penetration of water through the palm 5 can be reduced. In addition, since the coating 3 is formed from resin, artificial leather, or the like, slip resistance when a user handles an object with the glove 1 worn on his/her hand can be achieved, or improvement of grip force can be achieved.

[0078] In addition, the coating 3 includes the plurality of breathing pores 4, and the plurality of breathing pores 4 increase their opening areas when the glove 1 is worn more than when the glove 1 is not worn. Therefore, when a user wears the glove 1, the opening areas of the plurality of breathing pores 4 increase with the stretch of the coating 3, and breathability is obtained through these expanded breathing pores 4. When the glove 1 is not worn, these opening areas of the plurality of breathing pores 4 are smaller than those when the glove 1 is worn, or, in some cases, are not sufficiently opened, so that water is prevented from unnecessarily penetrating through the palm into the glove 1 when the glove 1 is not in use.

[0079] Thus, the glove 1 according to the first embodiment can achieve both a certain waterproof property expected when the glove is not in use, and grip force and breathability when the glove is in use.

[0080] Since the base layer 2 is made from fiber, the base layer 2 has a plurality of stitches created by knitting fibers. The stitch is defined as an opening space created between fibers. FIG. 4 is a front view showing the relationship between the base layer and the breathing pores of the glove according to the first embodiment. The base layer 2 is formed by knitting fibers 21. Therefore, a stitch 22, which is an opening space, is formed by combining lengthwise and crosswise fibers 21. The base layer 2 is made by knitting a plurality of fibers 21 lengthwise and crosswise, which results in that the base layer 2 has a plurality of stitches 22. That is, it can be said that the plurality of stitches 22 constitute the base layer 2.

[0081] The coating 3 is formed on the surface of the base layer 2, which results in that the coating 3 is formed on the surface of the stitches 22. The breathing pores 4 are provided in this coating 3, and the opening areas of

the breathing pores 4 increase by wearing of the glove 1. Therefore, by wearing of the glove 1, the opening areas of the breathing pores 4 increase, and then the breathing pores 4 communicate with the stitches 22 of the base layer 2. The stitches 22, of course, ventilates the surface of the hand, which results in that the surface of the hand, the stitches 22, the breathing pores 4, and the outside communicate with each other. As a result, humidity or water on the surface of the hand is released to the outside through the breathing pores 4, so that the breathability of the glove 1 increases. Of course, temperature lowering inside the glove 1 is promoted, so that a humid feeling is also reduced.

[0082] (Base layer)

[0083] The base layer 2 is a fundamental part of the glove 1 having an outer shape of a knitted glove made of fibers. The base layer 2 is manufactured by knitting natural materials, such as cotton or hemp, or synthetic fiber, such as nylon or polyester. Especially, it is preferred that woolly finished yarn is used. At this time, the base layer 2 is manufactured as a knitted fabric or woven fabric. In addition, if cellulose fiber, such as cotton or hemp, is used, the base layer 2 has a high humidity absorbing property. On the other hand, in terms of an antibacterial property, good texture, a humidity desorbing property, and a quick-drying property, it is also preferred that bamboo fiber is used. Regarding the bamboo fiber, a method of manufacturing the same is disclosed in Japanese Patent Application Laid-Open No. 2008-101291. In addition, the details of fiber identification and consumption characteristics of bamboo fiber are disclosed in Bulletin of Study No. 1 of Tokyo Metropolitan Industrial Technology Research Institute, 2006.

[0084] In either case, the base layer 2 is made from a fibrous material, and therefore the base layer 2 has a stretching property. This stretching property of the base layer 2 allows the glove 1 to stretch when a user wears the glove 1. When the user takes off the glove 1, of course, the glove 1 is relieved from the stretch and returns to its original size.

[0085] The glove 1 is manufactured with use of a former having the shape of a human hand. The shape and size of this former determine the shape and size of the glove 1. Therefore, the shape or size of the glove 1 can be changed by changing the former. For example, a change in shape or size, such as child size, adult size, male size, female size, or senior citizen size, or S size, M size, or L size, is realized by changing formers for manufacturing the glove 1.

[0086] Since the base layer 2 is made from material made of fibers, the base layer 2 has a plurality of stitches. The plurality of stitches allows the glove 1 worn on a hand of a user to breathe. The plurality of breathing pores 4 communicate with the stitches, thereby realizing breathability between the hand in the glove 1 and the outside. Therefore, the breathability of the glove 1 increases or decreases according to the shape, size, or position of the plurality of stitches included in the base layer 2.

[0087] As shown in FIGS. 1 and 2, the base layer 2 includes the palm 5, fingers 6, a wrist 7, and a palm back 8. A former used for manufacturing the glove 1 includes elements of these palm 5, fingers 6, wrist 7, and palm back 8, and fibers are knitted along this former, so that the base layer 2 obtains a shape including these elements. The elements of these palm 5, fingers 6, wrist 7, and palm back 8 not only correspond to the shape of a user's hand, but also relate to the differences in level of necessity for breathing air. Therefore, these elements cause various kinds of variations of breathability secured by the breathing pores 4.

(Coating)

[0088] The coating 3 is formed on the surface of the base layer 2. By dipping the manufactured base layer 2 in a liquid material, such as liquid resin which is a material for the coating 3, the coating 3 is formed on the surface of the base layer 2.

[0089] The coating 3 is formed on the surface of the base layer 2, but the coating 3 may be formed on the entire surface of the base body 2, or may be formed at least on the surface of the palm 5 of the base layer 2, or may be formed at least on the surfaces of the palm 5 and the finger 6 of the base layer 2, or may be formed on the surfaces of the palm 5, the fingers 6, and the palm back 8 of the base layer 2 (in the last case it means that the coating 3 is formed on the surface of the base layer 2 except for the wrist 7). The coating 3 aims at securing at least one of slip resistance, grip force enhancement, a simple waterproof property and safety when a user works with the glove 1 on his/her hand. Therefore, according to these aims, the coating 3 is formed partially or entirely on the surface of the base layer 2.

[0090] Generally, the coating 3 is formed on the surfaces of the palm 5 and the fingers 6. FIGS. 1 and 2 show this state. As shown in FIG. 1, the coating 3 is formed on the palm 5 and palm sides of the fingers 6. On the other hand, as shown in FIG. 2, the coating 3 is not formed on the palm back 8. Thus, since the coating 3 is not formed on the palm back 8, a hand in the glove 1 is not entirely covered with the coating 3. As a result, in a part where the coating 3 is not formed (in FIG. 2, for example, the wrist 7, the palm back 8, and the like), the stitches of the base layer 2 can secure breathability.

[0091] The coating 3 is formed from material, such as rubber latex or resin emulsion. As rubber latex, natural rubber latex or synthetic resin latex, such as acrylonitrile-butadiene rubber (hereinafter, called "NBR") or styrene-butadiene rubber (hereinafter, called "SBR"), is used. In addition, as resin emulsion, polyvinyl chloride resin, acrylic resin, urethane resin, or the like is used.

[0092] All of these materials have a waterproof property, a high gripping property, and a protecting property, and the coating 3 formed on the surface of the base layer 2 can provide various effects when a user wears the glove 1. Ignoring the presence of the breathing pores 4, a wa-

terproof property occurs in parts formed with the coating 3 due to the properties of these materials used for the coating 3.

[0093] The coating 3 is formed on the surface of the base layer 2 by dipping the base layer 2 in a liquid material, which is a material such as rubber latex or resin emulsion, which forms the coating 3. For example, a material, such as liquid rubber latex or resin emulsion, is stored in a container, and the base layer 2 is put into the container. For example, only the palm 5 of the base layer 2 is dipped in the liquid material. The dipping for a pre-determined period of time allows the liquid material to infiltrate into the fibers constituting the base layer 2. When dried, the infiltrating liquid material becomes solid. By this solidification, the coating 3 is formed on the surface of the base layer 2.

[0094] It should be noted that the coating 3 may be formed in such a manner that the base layer 2 kept worn on a former is dipped in the liquid material in order to prevent the base layer 2 from deforming. At this time, first, the base layer 2 is dipped in a coagulant, and then dipped in a liquid material obtained by mixing rubber latex or resin emulsion with a necessary compounding agent. This is because preliminary dipping in a coagulant allows the infiltrating liquid material to become solid easily on the surface of the base layer 2. When the liquid material becomes solid, the coating 3 is formed on the surface of the base layer 2.

[0095] In addition, if necessary, a stabilizer, a cross-linking agent, a cross-link dispersing element, an anti-aging agent, a thickener, a plasticizer, a defoamer, or the like is added to the liquid material which forms the coating 3. The liquid material with these additives infiltrates into the base layer 2, thereby forming the coating 3 on the surface of the base layer 2.

[0096] The cross-link dispersing element can be obtained by dispersing solid matter, such as an accelerator, such as BZ, TT, CZ, or PZ, or an accelerator activator, such as zinc oxide, or an anti-aging agent, in water, in addition to a cross-linking agent, such as sulfur or peroxide. The cross-link dispersing element is mainly used when the liquid material is rubber latex. Addition of a cross-link dispersing element to a rubber latex liquid material causes binding of rubber molecules in the form of a net, thereby improving physical properties of a resin coating, such as strength.

[0097] As described above, by dipping the surface of the base layer 2 in the liquid material, such as rubber latex or resin emulsion, the coating 3 is formed on the surface of the base layer 2. In particular, by dipping the surface of the base layer 2 in the liquid material, the coating 3 is formed on various desired parts of the base layer 2. The coating 3 not only improves the gripping property or handling ease of the glove 1, but also provides a balance with breathability, as described later, and therefore it is preferred that a part to be formed with the coating 3 on is determined as desired.

(Breathing pores)

[0098] Next, the breathing pores 4 will be described.

[0099] The breathing pores 4 is formed in the coating 3, and the opening areas of the breathing pores 4 when the glove 1 are worn is larger than the opening areas thereof when the glove 1 is not worn. By wearing the glove 1 on a user's hand, the opening areas of the breathing pore 4 are made larger than those when the glove 1 is not worn. As a result, a user of the glove 1 can secure breathability.

[0100] FIGS. 3A and 3B show a state that the opening areas of the breathing pores 4 have been expanded by wearing of the glove 4. In FIG. 3A showing that the glove 1 is not worn, the opening areas of the breathing pores 4 are small, but, in FIG. 3B showing that the glove 1 is worn, the opening areas of the breathing pores 4 are large. Since the base layer 2 has a stretching property, the coating 3 formed on the surface of the base layer 2 also has a stretching property. The breathing pores 4 are formed in the coating 3, in other words, the breathing pores 4 are like tears, cracks, holes, and cuts generated in a plurality of locations in the coating 3.

[0101] Since the coating 3 is stretched by wearing of the glove 1, these tears, cracks, holes, and cuts are expanded. Such expansion causes the opening areas of the breathing pores 4 to expand as shown in FIG. 3B. Due to expansion of the opening areas of the breathing pores 4, the breathing pores 4 communicate with openings of the stitches of the base layer 2, the surface of the human hand communicates with the outside, and thus airflow paths are formed. This airflow paths release humidity or steam (caused by sweat or the like) generated on the surface of the human hand to the outside, so that a user using the glove 1 can be kept comfortable.

[0102] FIGS. 5A and 5B are descriptive views showing how the breathing pores expand according to the first embodiment of the present invention. FIGS. 5A and 5B show a partial side view of the glove, showing that the plurality of breathing pores 4 formed in the coating 3 expands according to wearing of the glove 1 on a hand of a user.

[0103] FIG. 5A shows a partial side view of the glove 1 in an unworn state of the glove 1. A coating 3a is formed on the surface of a base layer 2a. The base layer 2a has stitches, and the base layer 2a and the coating 3a are not stretched when the glove 1 is not worn. Therefore, breathing pores 4a formed in the coating 3a still have small opening areas (not sufficiently opened). An encircled part in FIG. 5A shows an enlarged view of the side view of the glove 1. As shown in the enlarged view in FIG. 5A, when the glove 1 is not worn, the breathing pores 4a are closed or not sufficiently opened.

[0104] FIG. 5B shows a partial side view of the glove 1 in a worn state of the glove 1. An encircled part shows a partially enlarged view of the side view. A base layer 2b has stitches, and a coating 3b is formed on the surface of this base layer 2b. This coating 3b includes a plurality

of breathing pores 4b, and by wearing of the glove 1, the base layer 2b and the coating 3b are stretched. With this stretch, the breathing pores 4b expand. This is also obvious from the encircled enlarged view. The breathing pores 4b expand, and openings of the breathing pores 4b communicate with the stitches of the base layer 2. This communication allows humidity or the like on the surface of the hand to be released to the outside.

(Openings of the breathing pores 4)

[0105] The statement that the opening areas of the breathing pores 4 when the glove 1 is worn are larger than the opening areas of the breathing pores 4 when the glove 1 is not worn includes various conditions.

[0106] An example is a condition that when the glove 1 is not worn, the breathing pores 4 are opened but insufficiently opened and have small opening areas, and when the glove 1 is worn, the breathing pores 4 are sufficiently opened and have large opening areas. That is, the example is a condition that regardless of whether the glove 1 is worn or not worn, the breathing pores 4 are opened, but, when the glove 1 is worn, the opening areas of the breathing pores 4 expand.

[0107] In addition, another example is a condition that when the glove 1 is not worn, the breathing pores 4 are closed (shut up), and, when the glove 1 is worn, the breathing pores 4 are opened. That is, a condition that the breathing pores 4 become opened from their closed state is included.

[0108] In addition, the coating 3 includes the plurality of breathing pores 4, and the breathing pores 4 may be tears, cracks, holes, or cuts. Therefore, the plurality of breathing pores 4 may be a mixture of breathing pores 4 which opens from their closed state and breathing pores 4 which opens wider from their opened state. For example, when the glove 1 is not worn, some of the plurality of breathing pores 4 are closed, and the rest of the breathing pores 4 are opened. When the glove 1 is worn, the closed breathing pores 4 open, and the opened breathing pores 4 open wider.

[0109] Alternatively, there may be some of the plurality of breathing pores 4 which remain closed or remain small in opening area even if the glove 1 is worn. On the contrary, there may be some of the breathing pores 4 whose opening areas become small according to the degree of stretch of the base layer 2 or the coating 3 when the glove 1 is worn. For example, the palm 5 is easily stretched by wearing of the glove 1, but the base of the finger 6 or the sides of the palm 5 may be rather compressed. This is because, in this case, the breathing pores 4 in the palm 5 expand their opening, but the compression can prevent the breathing pores 4 at the base of the finger 6 or the sides of the palm 5 from expanding their opening, or can narrow the breathing pores 4 thereat.

[0110] Since the coating 3 includes the plurality of (numerous) breathing pores 4, when the glove 1 is not worn, there are various breathing pores 4, (1) some of which

are closed, (2) some of which are slightly opened, and (3) some of which are opened, and, when the glove 1 is worn, there are various breathing pores 4, (1) some of which become opened from their closed state, (2) some of which become larger in opening area than when the glove 1 is not worn, (3) some of which remain unchanged in opening area from when the glove 1 is not worn, and (4) some of which become smaller in opening area than when the glove 1 is not worn. Even in such a mixed state, most of the breathing pores 4 expand their opening area according to the stretch of the glove 1. As a result, breathability in the coating 3 is secured.

[0111] In addition, some of the breathing pores 4 are opened in a longitudinal direction of the glove 1, some of them are opened in a lateral direction thereof, some of them are opened in an oblique direction thereof, and some of them are opened in other directions. Which direction the breathing pores 4 are opened in depends on the locations or shapes of the breathing pores 4.

[0112] The opening area of each of the plurality of breathing pores 4 may become larger when the glove 1 is worn than when the glove 1 is not worn, or the total opening area of the plurality of breathing pores 4 may become larger when the glove 1 is worn than when the glove 1 is not worn. That is, in terms of one of the plurality of breathing pores 4, the opening area of this breathing pore 4 increases when the glove 1 is worn, so that the breathability is improved in the location where the breathing pore 4 is present. On the other hand, when the plurality of breathing pores 4 are considered as a whole, the total opening area of the breathing pores 4 increases, so that the glove 1 breathes well in total.

[0113] Regarding the glove 1 according to the first embodiment, the statement that the opening areas of the breathing pores 4 when the glove 1 is worn are larger than the opening areas of the breathing pores 4 when the glove 1 is not worn includes various patterns, and does not preclude the presence of different patterns in some of the plurality of breathing pores 4. In addition, the breathability may be improved by increasing the opening area of the breathing pore 4, or the breathability may be improved by increasing the total opening area of the breathing pores 4.

(Relation between the Breathing pores and the Base layer)

[0114] Next, the communication between the breathing pores 4 and the base layer 2 will be described. The way that the breathing pores 4 and the stitches 22 communicate with each other is as described above with reference to FIG. 4.

[0115] Since the base layer 2 has a fibrous structure, the base layer 2 has a plurality of stitches. The breathing pores 4 communicate with these stitches, thereby allowing air to pass between the surface of the hand and the outside. The stitches spread throughout the base layer 2, and the stitches are covered with the coating 3. There-

fore, when the breathing pores 4 located in the coating 3 are opened, the stitches, which are opened in their initial state (the stitches in this case further increase their opening area according to wearing of the glove 1), communicate with the openings of the breathing pores 4, so that air is allowed to pass between the surface of the hand and the outside. Therefore, the way of breathing varies according to the relationship between the openings of the stitches and the openings of the breathing pores 4.

[0116] For example, the total opening area of the plurality of stitches during wearing of the glove 1 is larger than the total opening area of the plurality of breathing pores 4. Since the stitches are included in the base layer 2, the stitches come into direct contact with the surface of the hand. On the other hand, the breathing pores 4 come into indirect contact with the surface of the hand. Ventilation of the glove 1 is performed in two directions: a taking-in direction in which air is taken into the glove 1 from the outside; and a discharging direction in which humidity or the like is released from the surface of the hand to the outside. Regarding these two directions, in order to maintain the comfort of a user of the glove 1, discharging performance in the discharging direction is important.

[0117] Since the opening areas of the stitches, which are closer to the surface of the hand, are larger than the opening areas of the breathing pores 4, which are farther from the surface of the hand, the openings of the stitches first suck a lot of humidity or steam from the surface of the hand, and then the openings of the breathing pores 4 release the humidity or steam passing through the stitches to the outside. Making the openings of the breathing pores 4 excessively large might cause the coating 3 to be torn or broken, so it is not preferred that the breathing pores 4 are made excessively large. This results in deterioration in glove durability. On the other hand, if the openings of the stitches are made small in the same manner as the breathing pores 4, the breathability in the discharging direction from the surface of the hand to the outside deteriorates. Thus, making the total opening area of the stitches larger than the total opening area of the breathing pores 4 improves breathing performance in the discharging direction from the surface of the hand to the outside, without lowering the durability of the glove 1.

[0118] In addition, the relationship between the openings of the stitches and the openings of the breathing pores 4 may be determined in terms of the total opening area, as described above, or may be determined in terms of the relationship between one of the plurality of stitches and one of the plurality of breathing pore 4.

[0119] For example, the opening area of one of the plurality of stitches is larger than the opening area of one of the plurality of breathing pores 4. It should be understood that in the relationship between the opening areas of the plurality of stitches and the opening areas of the plurality of breathing pores 4, the opening area of some stitch may be larger than the opening area of some

breathing pore 4, or the opening area of some stitch may be smaller than the opening area of some breathing pore 4. That is, when the relationship between some stitch and some breathing pore 4 is considered, the opening area of the stitch is large.

[0120] Thus, making the opening area of one of the plurality of stitches larger than the opening area of one of the plurality of breathing pores 4 improves breathability in the discharging direction from the surface of the hand to the outside, as in the case of the total opening area. As a result, the comfort of a user of the glove 1 increases.

[0121] Since the glove 1 is composed of the base layer 2 including the stitches and the coating 3 including the breathing pores 4, an aspect based on the interrelation between the stitches and the breathing pores 4 leads to enhancement or improvement in breathability. As described above, making the total opening area of the stitches or the opening area of some stitch larger than the total opening area of the breathing pores 4 or the opening area of some breathing pore 4 improves the breathability in the discharging direction which is important in breathability. It should be noted that making large the opening area of the stitches which come into contact with the surface of the hand can provide the advantage that the stitches absorb hot air from the surface of the hand higher in temperature than the outside, and then easily release the hot air to the outside.

[0122] In addition, it is also preferred that the total opening area of the stitches in the palm 5 of the base layer 2 is larger than the total opening area of the stitches in the palm back 8 of the base layer 2.

[0123] As shown in FIG. 2, in many cases, the coating 3 is provided on the palm 5, but not provided on the palm back 8. Therefore, the base layer 2 is exposed in the palm back 8, so that breathability can be secured even if the opening areas of the stitches of the base layer 2 are small. In addition, there is also the problem that excessively large opening areas of the stitches in the palm back 8 weaken a structural retentive ability of the glove 1.

[0124] On the other hand, since the palm 5 is covered with the coating 3 in many cases, it is important for the palm 5 to secure breathability. The coating 3 includes the breathing pores 4 whose opening areas expand according to wearing of the glove 1, and the breathing pores 4 can communicate with the stitches, thereby securing the breathability of the glove 1. Therefore, it is important to make the opening areas of the stitches larger in order to improve the breathability (in particular, to improve the breathability in the discharging direction from the surface of the hand to the outside). In terms of breathability, large opening areas of the stitches are effective in the palm 5. It is necessary, of course, to keep a limit at which the glove 1 can exert its structural retentive ability. However, since the palm 5 are covered with the coating 3, even if the opening areas of the stitches of the base layer 2 are large, the glove 1 can exert its structural retentive ability.

[0125] Thus, making the total opening area of the stitches of the base layer 2 larger in the palm 5 than in

the palm back 8 can realize well-balanced breathability of the whole glove 1, while keeping the structural retentive ability of the glove 1.

[0126] It should be noted that the difference in the total opening area of the stitches between the palm 5 and the palm back 8 may be determined by the number of the stitches, or may be determined by the opening areas of individual stitches, or may be determined by multiplying the number of the stitches by the opening of the stitch.

[0127] As described above, since the breathing pores 4 provided in the coating 3 expand their opening areas according to wearing of the glove 1, the glove 1 according to the first embodiment can realize breathability, without impairing the grip force or ease in handling of the glove 1.

(Second Embodiment)

[0128] Next a second embodiment will be described. Regarding the second embodiment, the relationship between the parts of the glove 1 and the breathing pores 4 will be described.

[0129] The glove 1, of course, is worn on a human hand. The glove 1 of the present invention expands the opening areas of the breathing pores 4 according to wearing of the glove 1, thereby securing breathability. Here, when a person with his/her hand worn with a glove works, sweat or humidity is collected at different locations on his/her hand. Further, in addition to the difference in location where sweat or humidity is collected, the level of discomfort due to sweat or humidity varies for respective locations. For example, the base of the finger 6 is easily depressed because of its structure, and sweat or water easily collects in this depression.

[0130] Thus, it may be necessary to provide differences in level of breathability among parts of a hand (parts of the glove 1). It is preferred that the differences in level of breathability are set by various parameters, such as the number, opening area, or total opening area of breathing pores 4, or the number, opening area, or total opening area of stitches.

[0131] Therefore, it is also preferred that at least either one of the number of the breathing pores 4 per unit area (hereinafter, called "unit number") of a plurality of breathing pores 4 and the total opening area of the breathing pores 4 per unit area (hereinafter, called "unit opening area") of a plurality of breathing pores 4 differs according to respective parts of the glove 1. Based on this difference, differences in level of breathability occur according to the part of the glove 1 (that is, according to parts of a human hand). Differences in level of breathability can be optimally adapted to user's discomfort.

[0132] In the glove 1 according to the second embodiment, the fact that at least either one of the unit number and unit opening area of the breathing pores 4 differs according to parts of the glove causes unevenness in level of breathability, but the difference of breathability varies according to the feeling of a user or the aspect of use of the glove. Therefore, some examples will be

shown below.

(Example 1 Giving priority to the base of a finger over a palm)

[0133] The unit number in a base 61 of the finger 6 of the glove 1 is larger than the unit number in the palm 5 of the glove 1. Alternatively, the unit opening area in the base 61 of the finger 6 of the glove 1 is larger than the unit opening area in the palm 5 of the glove 1. Only one of the unit number and unit opening area may be more or larger, or both the unit number and the unit opening area may be more or larger.

[0134] FIG. 6 is a front view of the glove according to the second embodiment of the present invention. FIG. 6 shows the breathing pores 4 larger than what they should be originally, so that the distribution of the breathing pores 4 can be easily understood. All circles drawn in the surface of the coating 3 in FIG. 6 schematically represent the breathing pores 4.

[0135] As shown in FIG. 6, the unit number in the base 61 of the finger 6 is more than the unit number in the palm 5. In a user's hand, a depression is easily formed in the base of a finger, in which sweat or humidity inevitably easily collects. In addition, since the base of a finger is in contact with an adjacent finger, sweat or humidity collecting in the base of a finger causes a user to feel discomfort. On the other hand, since the palm has a large area, it can be thought that even if the unit number is small in the palm, sweat or humidity does not easily collect in the palm.

[0136] Therefore, it is preferred that the unit number in the base 61 of the finger 6 of the glove 1 corresponding to the base of a finger of a user's hand is larger than the unit number in the palm 5 of the glove 1 corresponding to the palm of a user's hand. This is because as the unit number increases, it becomes easier to release steam or humidity from the base 61 of the finger 6 in which sweat or humidity easily collects.

[0137] In addition, FIG. 6 shows the difference in unit number, but the difference in unit opening area makes no difference. That is, making the unit opening area in the base 61 of the finger 6 larger than the unit opening area in the palm 5 increases the breathability in the base of a finger where sweat or humidity more easily collects. As a result, a high degree of comfort of a user of the glove 1 is kept.

[0138] It should be understood that even if either one of the unit number and unit opening area in the base 61 of the finger 6 is smaller than either one of the unit number and unit opening area in the palm 5, the breathability in the base 61 of the finger 6 can be made higher than the breathability in the palm 5 by making the other in the base 61 of the finger 6 larger than the other in the palm 5. Of course, when any one of the plurality of breathing pores 4 is considered, even if the opening area of any one of the plurality of breathing pores 4 in the base 61 of the finger 6 is smaller than the opening area of any one of

the plurality of breathing pores 4 in the palm 5, it is only required that there is a difference in least either one of the unit number and unit opening area as a whole. It is preferred that such a difference makes the breathability of the base 61 of the finger 6 larger than the breathability of the palm 5 for the purpose of user's comfort.

[0139] It should be noted that this comparison between the base 61 of the finger 6 and the palm 5 of the glove 1 means a comparison between the design of the breathing pores 4 formed in the coating 3 in a location corresponding to the base 61 of the finger 6 of the glove 1 and the design of the breathing pores 4 formed in the coating 3 in a location corresponding to the palm 5 of the glove 1.

(Example 2 A case where breathing of a finger is given priority over breathing of a palm)

[0140] At least either one of the unit number and unit opening area of the breathing pores 4 in the finger 6 of the glove 1 is more or larger than at least either one of the unit number and unit opening area of the breathing pores 4 in the palm 5 of the glove 1. That is, the unit number in the finger 6 of the glove 1 is more than the unit number in the palm 5 of the glove 1. Alternatively, the unit opening area in the finger 6 of the glove 1 is larger than the unit opening area in the palm 5 of the glove 1. Alternatively, both the unit number and unit opening area in the finger 6 of the glove 1 are more or larger than the unit number and unit opening area in the palm 5 of the glove 1.

[0141] That is, the breathing pores 4 in the finger 6 of the glove 1 have higher breathing performance than the breathing pores 4 in the palm 5 of the glove 1 on the basis of the number or opening area thereof. The breathing pores 4 increase their opening areas when the glove 1 is worn. By this increase in opening area, the breathing pores 4 allow breathing between the surface of the hand and the outside. Therefore, since the unit number or unit opening area in the finger 6 is larger than the unit number or unit opening area in the palm 5, the breathing performance of the breathing pores 4 in the finger 6 is higher than the breathing performance of the breathing pores 4 in the palm 5.

[0142] Since the unit number in the finger 6 is more than the unit number in the palm 5, the finger 6 has a larger number of airflow paths between the surface of the hand and the outside than the palm 5. Since the number of airflow paths is more, the breathability in the finger 6 becomes relatively higher than the breathability in the palm 5. This is also achieved by making the unit opening area in the finger 6 larger than the unit opening area in the palm 5.

[0143] In a human hand, a finger has a complicated shape and has a plurality of joints. Therefore, sweat or humidity easily collects in the finger due to the joints or complicated shape. In this regard, as described above, since at least either one of the unit number and unit opening area in the finger 6 is more or larger than at least

either one of the unit number and unit opening area in the palm 5, sweat or humidity that collects easily in the finger can be released more efficiently. As a result, user's comfort can be kept. In addition, since the unit number or unit opening area in the palm 5 is relatively few or small, the coating 3 can be prevented from being damaged.

[0144] It should be noted that the unit number or unit opening area represents the number or total opening area of the breathing pores 4 in a predetermined unit area (for example, 1 cm² or the like), and the predetermined unit area can be determined optionally and flexibly. In addition, regarding the difference in number or unit opening area, it is only required to show a tendency to have the difference, and it is not required to prove an exact difference in unit number or unit opening area. For example, even if a region where the unit number in the finger 6 is less than the unit number in the palm 5 and a region where the unit number in the finger 6 is more than the unit number in the palm 5 exist in a mixed manner due to change of a region representing a unit area, as long as the unit number in the finger 6 has a tendency to be larger than the unit number in the palm 5, the unit number in the finger 6 is regarded to be more than the unit number in the palm 5. This is also applied to the case of the unit opening area.

[0145] In addition, while the unit number in the finger 6 is more than the unit number in the palm 5, the unit opening area in the finger 6 may be smaller than the unit opening area in the palm 5. On the contrary, while the unit opening area in the finger 6 is larger than the unit opening area in the palm 5, the unit number in the finger 6 may be less than the unit number in the palm 5. In either case, it is only required that the aspect of the glove 1 where the breathing performance in the finger 6 is higher than the breathing performance in the palm 5 appears based upon the shape, number, opening area, or total opening area of the breathing pores 4.

(Manufacturing method)

[0146] The breathing pores 4 are formed by various means, such as air bubbles in the coating 3 or attaching particles to the coating 3. Therefore, the glove 1 described in Example 2 where the unit number in the finger 6 is more than unit number in the palm 5 is manufactured by making the number of air bubbles in the coating 3 or the number of particles to be attached to the coating 3 more in the finger 6 than in the palm 5.

[0147] On the other hand, the glove 1 described in Example 2 where the unit opening area in the finger 6 is larger than the unit opening area in the palm 5 is manufactured by making the sizes of individual air bubbles or the sizes of a particles to be attached larger in the finger 6 than in the palm 5.

[0148] In addition, not on the basis of an element that is difficult to control in manufacture, such as air bubbles or particles by which the breathing pores 4 are formed,

but on the basis of the design of a former for manufacturing the glove 1, an aspect that the unit opening area in the finger 6 is made larger than the unit opening area in the palm 5 can be realized.

[0149] In the former for manufacturing the glove 1, the size of a finger is smaller than a standard size thereof, and the size of a palm is larger than a standard size thereof. For example, a small size is used for the size of the finger of the former is, and a middle size for the size of the palm. Of course, combination of other sizes may be used. Since the size of a finger of the former is smaller than a standard size thereof, and the size of a palm is larger than a standard size thereof, the glove 1 to be manufactured has a size of a finger 6 relatively smaller than the size of palm 5.

[0150] When the glove 1 is worn, since the size of the finger 6 is relatively smaller than the size of the palm 5, the finger 6 is stretched more than the palm 5 according to wearing of the glove 1. The breathing pores 4 increase their opening areas according to the stretch of the glove 1 (base layer 2). Therefore, when the degree of stretch of the finger 6 is larger than the degree of stretch of the palm 5, the breathing pores 4 in the finger 6 open wider than the breathing pores 4 in the palm 5. As a result, the unit opening area of the finger 6 becomes easier to expand than the unit opening area of the palm 5. In consideration of the fact that a hand is inserted into the glove 1 when the glove 1 is worn, the glove 1 is so manufactured as to be unbalanced in order to adjust the opening areas of the breathing pores 4.

[0151] Thus, since the former for manufacturing the glove 1 has a finger and a palm in an unbalanced relationship, the unit opening area in the finger 6 becomes larger than the unit opening area in the palm 5.

(Example 3 A case where breathing of a palm is given priority over breathing of a finger)

[0152] At least either one of the unit number and unit opening area in the finger 6 of the glove 1 is less or smaller than at least either one of the unit number and unit opening area in the palm 5 of the glove 1. That is, the unit number in the finger 6 of the glove 1 is less than the unit number in the palm 5 of the glove 1. Alternatively, the unit opening area in the finger 6 of the glove 1 is smaller than the unit opening area in the palm of the glove 1. Alternatively, both the unit number and unit opening area in the finger 6 of the glove 1 are less or smaller than both the unit number and unit opening area in the palm 5 of the glove 1.

[0153] FIG. 7 is a front view of the glove according to the second embodiment of the present invention. FIG. 7 shows an aspect of the glove 1 where the unit number in the finger 6 is less than the unit number in the palm 5.

[0154] That is, the breathing pores 4 in the palm 5 of the glove 1 have higher breathing performance than the breathing pores 4 in the finger 6 of the glove 1 on the basis of the number or opening areas of the breathing

pores 4. The breathing pores 4 increase opening areas when the glove 1 is worn. This increase in opening area allows the breathing pores 4 to breathe air between the surface of the hand and the outside. Therefore, since the unit number or unit opening areas in the palm 5 is larger than the unit number or unit opening areas in the finger 6, the breathing pores 4 in the palm 5 have higher breathing performance than the breathing pores 4 in the finger 6.

[0155] Since the unit number in the palm 5 is more than the unit number in the finger 6, the palm 5 has a larger number of airflow paths between the surface of the hand and the outside of the glove 1 than the finger 6 has. Since the palm 5 has a larger number of the airflow paths, the breathability in the palm 5 becomes higher relative to the breathability in the finger 6. This can also be achieved by making the unit opening area in the palm 5 larger than the unit opening area in the finger 6.

[0156] In a human hand, a palm is thought to sweat the most. This is because a palm has a large surface area, and performs bending or grasping, or comes into thermal contact with a grasped object. In addition, since a palm is bent when an object is grasped with a hand, produced sweat easily collects on the surface of the palm. Furthermore, the grasped object acts as an obstacle that makes it difficult to release sweat or humidity collecting on the surface of the palm. In order to solve such a problem, by making at least either one of the unit number or unit opening area in the finger 6 less or smaller than at least either one of the unit number or unit opening area in the palm 5, like Example 3, it is made possible for the sweat or humidity that collects easily on the surface of the palm to be released efficiently to the outside.

[0157] Here, since the unit number or unit opening area in the finger 6 is relatively less or smaller than the unit number or unit opening area in the palm 5, openings due to the breathing pores 4 in the whole coating 3 is not increased excessively. As a result, the durability or strength of the coating 3 is not affected adversely.

[0158] It should be noted that the unit number or unit opening area in an arbitrary region in the finger 6 and the unit number or unit opening area in an arbitrary region in the palm 5 can be compared with each other, and that it is only required that at least either one of the unit number or unit opening area in the finger 6 shows a tendency to be less or smaller than at least either one of the unit number or unit opening area in the palm 5. That is, the possibility is not excluded that the unit number or unit opening area in a certain region in the finger 6 may be more or larger than the unit number or unit opening area in a certain region in the palm 5. Even if such a reverse aspect is detected, as long as it is found that as a whole, the unit number or unit opening area in the finger 6 has a tendency to be less or smaller than the unit number or unit opening area in the palm 5, it can be determined that at least either one of the unit number and unit opening area in the finger 6 is less or smaller than at least either one of the unit number and unit opening area in the palm 5. That is, regarding the difference in number or unit

opening area, it is only required to show a tendency to have the difference, and it is not required to prove an exact difference in unit number or unit opening area.

[0159] In addition, such an aspect can be adopted that the unit number in the finger 6 is less than the unit number in the palm 5, while the unit opening area in the finger 6 is larger than the unit opening area in the palm 5. On the contrary, such an aspect can be adopted that the unit opening area in the finger 6 is smaller than the unit opening area in the palm 5, while the unit number in the finger 6 is more than the unit opening area in the palm 5.

[0160] In any case, it is only required that the aspect of the glove 1 where the breathing performance in the palm 5 is higher than the breathing performance in the finger 6 appears based upon the shape, number, opening areas, or total opening area of the breathing pores 4.

[0161] In addition, the unit opening area used in describing Examples 1, 2, and 3 is based on the opening areas of the breathing pores 4 when the glove 1 is worn, and this accepts the possibility that the worn state of the glove 1 can vary according to respective wearers. In addition, the unit opening area based on the opening areas of the breathing pores 4 when the glove 1 is not worn is not excluded.

(Manufacturing Method)

[0162] A method for manufacturing the glove 1 corresponding to the aspect of the Example 3 will be described.

[0163] The breathing pores 4 are formed by various means, such as forming air bubbles in the coating 3 or attaching particles to the coating 3. Therefore, the glove 1 described in Example 3 where the unit number in the finger 6 is less than the unit number in the palm 5 is manufactured by making the number of air bubbles in the coating 3 or the number of particles attached to the coating 3 less in the finger 6 than in the palm 5.

[0164] On the other hand, the glove 1 described in Example 3 where the unit opening area in the finger 6 is smaller than the unit opening area in the palm 5 is manufactured by making the size of an individual air bubble or the size of an attached particle smaller in the finger 6 than in the palm 5.

[0165] In addition, not on the basis of an element that is difficult to control in manufacture, such as air bubbles or particles that form the breathing pores 4, but by the design of the former for manufacturing the glove 1, the glove 1 can obtain an aspect where the unit opening area in the finger 6 is smaller than the unit opening area in the palm 5.

[0166] The size of a finger of the former for manufacturing the glove 1 is equal to or larger than the standard size of the corresponding finger of a human hand, and the size of a palm of the former is smaller than the standard size of the palm of a human hand. For example, while the size of the finger of the former is a middle size, a small size is used as the size of the palm. Of course, combination of other sizes may be used. Since the size

of the finger of the former is equal to or larger than the standard size and the size of the palm of the former is smaller than the standard size, the manufactured glove 1 has the finger 6 that is large relative to the size of the palm 5.

[0167] For example, when the original pattern is of a large size, the following values are applied:

Standard: a middle finger circumference of 68 mm; and a palm circumference of 220 mm

Example: a middle finger circumference of 68 mm; and a palm circumference of 180 mm.

[0168] As can be seen from this example, in a comparison of middle finger circumference between the standard and the example, $68 \text{ mm}/68 \text{ mm} = 1.0$, but, in a comparison of palm circumference between the standard and the example, $180 \text{ mm}/220 \text{ mm} = 0.8$. Thus, the size of the finger of the example is equal to or larger than the size of the finger of the standard, and the size of the palm of the example is smaller than the size of the palm of the standard. Here, the standard represents a size obtained on the basis of an average value calculated from numerous measured examples by the inventors.

[0169] When the glove 1 is worn, since the size of the palm 5 is small relative to the size of the finger 6, the palm 5 stretches more than the finger 6 according to wearing of the glove 1. The opening areas of the breathing pores 4 increase according to the stretch of the glove 1 (base layer 2). Therefore, when the degree of stretch of the palm 5 is higher than the degree of stretch of the finger 6, the breathing pores 4 in the palm 5 open wider than the breathing pores 4 in the finger 6. As a result, the unit opening area of the palm 5 becomes easier to expand than the unit opening area of the finger 6. In consideration of the fact that a hand is inserted into the glove 1 when the glove 1 is worn, the opening areas of the breathing pores 4 is adjusted by manufacturing the glove 1 to be unbalanced in advance.

[0170] Thus, since the former for manufacturing the glove 1 has a finger and a palm in an unbalanced relationship, the unit opening area in the palm 5 becomes larger than the unit opening area in the finger 6.

[0171] The breathing pores 4, of course, becomes more breathable as the number of the breathing pores 4 or the opening area of the breathing pore 4 increases. However, the breathing pore 4 is formed in the coating 3, and the breathing pores 4 are tears or cracks penetrating the coating 3. Therefore, if the number of the breathing pores 4 or the opening area of the breathing pore 4 increases excessively, the coating 3 may be torn or damaged, resulting in the glove 1 being no longer usable.

[0172] As described in the second embodiment, both preventing the coating 3 from being damaged and securing breathability required depending on the parts of the coating 3 can be satisfied by making the unit number or

unit opening area of the breathing pores 4 different according to the parts of the glove 1. Since differences in level of breathability are required according to respective parts of a human hand, as described in the second embodiment, it is preferred that the differences in level of breathability are provided in consideration of ensuring the compatibility with damage prevention of the coating 3.

[0173] (Third Embodiment)

[0174] Next, a third embodiment will be described. In the third embodiment, a design for opening the breathing pores 4 more easily will be described.

[0175] FIGS. 8A and 8B are side views of the glove 1 in the third embodiment of the present invention. FIG. 8A shows a side view of the glove 1 in an unworn state, and FIG. 8B shows a side view of the glove 1 in a worn state.

[0176] As shown in FIG. 8A, the finger 6 of the glove 1 is bent to the side of the palm 5 when the glove 1 is not worn. Since the glove 1 is manufactured in such a manner that the finger 6 is bent to the side of the palm 5 when the glove 1 is not worn, the coating 3 is also bent toward the side of the palm 5. That is, the coating 3 is put in a shrunk state toward the side of the palm 5. When the coating 3 is shrunk toward the side of the palm 5, the breathing pores 4 formed in the coating 3 have small opening areas.

[0177] On the other hand, as shown in FIG. 8B, when the glove 1 is worn, the finger 6 is stretched straight in such a manner that the finger 6 bent toward the side of the palm 5 becomes nearly parallel to the palm back 8. As a result, the coating 3 formed on the palm 5 is so stretched as to bend backward. This stretch allows the breathing pores 4 formed in the coating 3 on the palm 5 to open sufficiently. When the breathing pores 4, in particular the breathing pores 4 on the palm 5, are opened sufficiently, air exhaust or breathing on the surface of a palm on which sweat or humidity easily collects is improved. This is because it is generally thought that the palm of a hand sweats more easily than the palm back, and sweat more easily collects on the palm than on the palm back.

[0178] As shown in FIGS. 8A and 8B, since the finger 6 has been bent toward the side of the palm 5 in a manufactured stage of the glove 1, when the glove 1 is worn, the palm 5 or the finger 6 on the side of the palm 5 are easily stretched, of course. In view of a waterproof property or durability, it is not preferred that the breathing pores 4 are opened wide when the glove 1 is not worn, but it is difficult to design the shape of the breathing pores 4 so that the opening areas of the breathing pores 4 expand when the glove 1 is worn. On the other hand, if the coating 3 on the palm 5 is easily stretched by wearing of the glove 1, it becomes possible to open the breathing pores 4 sufficiently without applying extra stress to the coating 3 or the breathing pores 4 (and, of course, without giving a user consideration or stress in wearing the glove 1).

[0179] On the other hand, when the glove 1 is manufactured with the finger 6 has not been bent toward the

side of the palm 5 in the manufactured stage of the glove 1 (for example, imagine the state shown in FIG. 8B), the coating 3 on the palm 5 is not easily stretched even when a user wears the glove 1. As a result, the breathing pores 4 on the palm 5 are not opened wide. As a result, breathing of the palm where sweat or humidity easily collects becomes insufficient.

[0180] In addition to the state that the finger 6 has been bent toward the side of the palm 5, as shown in FIGS. 8A and 8B, the palm 5 may be curled inward, or respective fingers 6 may be put in different bent states. This is because by wearing of the glove 1, the coating 3 on the palm 5 or the finger 6 naturally stretches, resulting in expansion of the breathing pores 4. Of course, when it is desired that breathing of the palm back 8 be enhanced, in the opposite manner from what is shown in FIG. 8A, the glove 1 can be so manufactured as to have the finger 6 bent toward the side of the palm back 8.

[0181] As described above, since the glove 1 according to the third embodiment is so manufactured as to have a bent shape in advance, the breathing pores 4 expand by wearing of the glove 1. As a result, the glove 1 can be realized with high breathability or a high air exhausting property.

[0182] (Fourth Embodiment)

[0183] Next, a fourth embodiment will be described.

[0184] In the fourth embodiment, a method for forming the breathing pores 4 will be described.

[0185] The breathing pores 4 are formed in the coating 3. An element is identified as a pore like the breathing pore 4, but includes not only a circular or oval pore but also a wide variety of through-holes having unspecified shapes, such as a tear or a crack. Therefore, the pore shape of the breathing pore 4 includes various shapes, such as a circle, oval, square, rectangle, rhombus, bar-like shape, straight-line shape, or broken line shape.

[0186] Since the breathing pores 4 are formed in the coating 3, the breathing pores 4 are formed by various methods in the stage of formation of the coating 3.

[0187] Since the coating 3 is formed by dipping the base layer 2 in a liquid material, the breathing pores 4 are formed when the base layer 2 is dipped in the liquid material or in the process before or after dipping.

[0188] (Formation by foaming)

[0189] The coating 3 is made from a foaming liquid material, and the breathing pores 4 are formed by drying the liquid material infiltrating the dipped base layer 2, and then rupturing air bubbles. FIG. 9 is a descriptive view showing a process for forming the breathing pores 4 according to the fourth embodiment of the present invention. FIG. 9 shows side faces of the base layer 2 and the coating 3.

[0190] The coating 3 is infiltrated into the base layer 2 as a liquid material. The liquid material has foaming property, and has a plurality of air bubbles 4A. The air bubbles 4A are kept while the coating 3 is in the form of a liquid, but rupture according to drying of the coating 3 after the infiltration. The bottom half of FIG. 9 shows that the air

bubbles 4A have been ruptured. Traces of the air bubbles 4A define the breathing pores 4 that connect the base layer 2 and the outside of the glove 1. Of course, there is the possibility that some of the air bubbles 4A are not so ruptured as to reach the base layer 2, but, in that case, the breathing pores 4 can be torn to the base layer 2 through the use of the glove 1.

[0191] Since the base layer 2 is dipped in a preliminarily foamed liquid material, the coating 3 containing the air bubbles 4A is formed, and the rupture of the air bubbles 4A forms the breathing pores 4. By taking advantage of such air bubbles 4A, the breathing pores 4 are easily formed.

[0192] An existing mechanical method or chemical method is used to cause the liquid material to contain air bubbles. In a mechanical method, air is supplied into the liquid material while the liquid material is being stirred, and when a predetermined volume is reached, the air supply is stopped, and the liquid material is stirred until the bubbles are stabilized.

[0193] It is preferred that the amount of air bubbles contained in the coating 3 is less than 15 vol % per unit volume of the coating 3. More preferably, the amount thereof is 5 to 10 vol %. More than 10 vol % of air bubbles improves breathability but reduces wear resistance. On the contrary, less than 5 vol % of air bubbles deteriorates breathability, but improves wear resistance. Therefore, it is preferred that the amount of air bubbles is 5 to 10 vol %.

[0194] The amount of air bubbles is measured according to the following procedure. First, 500 ml of the liquid material is poured into a graduated cylinder whose weight is known so that the weight of this liquid material is measured. Since the specific gravity of liquid material is generally "1", the amount of air bubbles is determined by the calculation formula "the amount of air bubbles = (500 - the weight of the liquid material) / 500".

[0195] (Formation by particles)

[0196] In addition, the liquid material that forms the coating 3 contains particles, and the base layer 2 is dipped in this liquid material containing particles serving as the coating 3 so that the liquid material containing particles infiltrates into the base layer 2. In the process of drying the infiltrating liquid material to form the coating 3, the particles fall off or damage the coating 3, thereby forming the breathing pores 4. This is because due to the fall of the particles or the damages by the particles, the coating 3 is perforated so that the base layer 2 and the outside of the glove 1 are connected to each other.

[0197] Alternatively, the particles may be attached to the surface of the coating 3 after the base layer 2 is dipped in the liquid material. Similarly, the attached particles fall off or damage the coating 3, thereby forming the breathing pores 4. In addition, it is also preferred that in the process of drying the liquid material, the breathing pores 4 are forcibly formed in the coating 3 by removing the particles or moving the particles on the coating 3 forcibly.

[0198] As described above, the breathing pores 4 are

formed in the process of dipping the base layer 2 in the liquid material that forms the coating 3 or in the process after the dipping.

[0199] It should be understood that the above processes are only examples of forming the breathing pores 4, and a needle-like tool may be used to form the breathing pores 4.

[0200] (Fifth Embodiment)

[0201] Next, a fifth embodiment will be described. In the fifth embodiment, an actual process of manufacturing the glove will be described.

[0202] (Manufacture of the base layer)

[0203] First, the base layer 2 is manufactured.

[0204] The base layer 2 is manufactured by knitting or weaving a fabric from natural fiber, such as cotton, or synthetic fiber, such as nylon or polyester. In this regard, it is preferred that such a material as natural fiber or synthetic fiber is woolly finished. In addition, as described in the third embodiment, the size of the finger of the former may be smaller than the standard size, and the size of the palm of the former may be equal to or larger than the standard size. Alternatively, the size of the finger of the former may be equal to or larger than the standard size, and the size of the palm of the former may be smaller than the standard size. In either case, the opening areas of the breathing pores 4 of the finger 6 and the opening areas of the breathing pore 4 of the palm 5 may be made different from each other.

[0205] In addition, as described in the first embodiment, using bamboo fiber is also preferred.

(Manufacture of a liquid material that forms the coating)

[0206] The coating 3 is formed by dipping the base layer 2 in such a liquid material as resin.

[0207] It is preferred that rubber latex or resin emulsion is used as the liquid material. The rubber latex includes natural rubber latex, and synthetic resin latex, such as NBR and SBR. The resin emulsion includes polyvinyl chloride resin, acrylic resin, urethane resin, and the like.

[0208] The liquid material is prepared by adding a stabilizer, a cross-linking agent, a cross-link dispersing element, an anti-aging agent, a thickener, a plasticizer, an defoamer, or the like, if necessary, to these kinds of rubber latex or resin emulsion. By dipping the base layer 2 in the liquid material thus prepared, the coating 3 is formed on the surface of the base layer 2. The coating 3 is provided for the purpose of improving not only water-proof property but also the gripping property of the glove 1.

[0209] This coating 3 includes the breathing pores 4, and the breathing pores 4 are formed by tears, cracks, cuts or the like in the coating 3. Specifically, the breathing pores 4 may be formed such that a force applied by wearing of the base layer 2 (the base layer 2 may be worn on a human hand or may be worn on the former used in manufacture) generates tears, cracks, or cuts in the coating 3 formed on the surface of the base layer 2. Therefore,

it is preferred that the coating 3 is easily torn or broken.

[0210] Since the coating 3 is made easily tearable or breakable, the following ideas are applied to the manufacturing process of the liquid material itself or to the manufacturing process of the coating 3.

(Example 1)

[0211] The liquid material is prepared by mixing a main material, such as rubber latex, with an additive, such as a stabilizer. This liquid material is matured for a predetermined period of time. By making this maturing period longer than usual, the liquid material is excessively matured. The excessively-matured liquid material can form the coating 3 that is easily tearable or breakable.

(Example 2)

[0212] It is also preferred that the rubber purity is reduced by mixing the liquid material with a lot of filler. If the rubber purity is reduced, the liquid material can form the coating 3 that is easily tearable or breakable.

(Example 3)

[0213] As described in the fourth embodiment, it is also preferred that the liquid material is preliminarily foamed. Foaming may be performed by stirring the liquid material (in particular, stirring while supplying air). The breathing pores 4 are easily formed by communication or rupture of air bubbles obtained by foaming. In addition, of course, the liquid material containing air bubbles due to foaming can form the coating 3 that is easily tearable or breakable. In addition, it is also preferred that air bubbles are ruptured at the step of dipping the coating 3 in a solvent (swelling the coating 3).

(Example 4)

[0214] It is also preferred that the liquid material is mixed with particles or powder. Since the liquid material is mixed with particles or powder, the particles or powder is also attached to the coating 3. Stresses are concentrated around the particles or powder, so that the coating 3 is easily torn. That is, such a liquid material can form the coating 3 that is easily tearable or breakable. It should be noted that particles may be attached at the step of dipping the coating 3 in a solvent (swelling the coating 3).

(Example 5)

[0215] It is also preferred that the coating 3 is thinned. This is because if the coating 3 is thin, of course, the coating 3 is easily tearable or breakable. The thickness of the coating 3 is adjusted, for example, according to the time for which the base layer 2 is dipped in the liquid material, the viscosity of the liquid material, or the like.

(Example 6)

[0216] After dipping the base layer 2 in the liquid material, the coating 3 is dipped in a solvent having a similar solubility parameter to the coating 3. As a result, the coating 3 is swollen. Thereafter, when the coating 3 is dried, the coating 3 is shrunk and becomes rough. That is, the surface of the coating 3 is very finely corrugated. Such roughness makes the coating 3 easily tearable or breakable.

[0217] As described above, the coating 3 formed according to any one method of Examples 1 to 6 is easily tearable or breakable, so that the breathing pores 4 are easily formed.

[0218] In addition, respective parts of the glove 1, such as the finger 6, the base 61, and the palm 5, may be dipped in different liquid materials prepared by any one of Examples 1 to 6. For example, if it is desired that the number or the total opening area of the breathing pores 4 of the finger 6 increases, the liquid material in which the finger 6 is dipped is prepared by any one of Example 1 to 6, while the liquid material in which the palm 5 is dipped is not treated by any one of Examples 1 to 6. On the other hand, if it is desired that the number or the total opening area of the breathing pores 4 of the palm 5 is larger than that of the finger 6, the liquid material in which the palm 5 is dipped is prepared by any one of Examples 1 to 6, while the liquid material in which the finger 6 is dipped is not treated by any one of Examples 1 to 6.

[0219] In addition, it is also preferred that the liquid material is subjected to maturing process. The liquid material obtained by mixing resin with various substances is matured for an arbitrary period of time at a temperature of 30 °C. The liquid material after such maturing process affects the coating 3 to be formed.

[0220] (Formation of the coating 3)

[0221] The base layer 2 is dipped in the liquid material.

[0222] First, the base layer 2 is put on the former, and subjected to temperature adjustment. Thereafter, the base layer 2 is dipped in a coagulant. Furthermore, the base layer 2 is dipped in the liquid material. After the dipping, the base layer 2 is taken out of the liquid material, and the coating 2 is formed by performing such a treatment as drying.

[0223] For coagulation of the liquid material, a salt coagulation method, a heat-sensitive coagulation method, a straight dipping method, or the like is used. The salt coagulation is a method for gelation of the liquid material with salt. The thermal corrugation method is a method for thermal gelation of the liquid material preliminarily added with a heat sensitizing agent. The straight dipping method is a method for gelation of the liquid material by drying without using a coagulation agent or a heat sensitizing agent. For the coagulation agent used in the salt coagulation method, calcium nitrate, calcium chloride, or the like is used.

[0224] The liquid material may be dried by hot wind, or dried by being left at room temperature.

[0225] (Formation of the breathing pores 4)

After the coating 3 is formed according to drying of the liquid material, the breathing pores 4 are formed in the coating 3 by such an event as wearing of the glove 1. Since the breathing pores 4 are formed from cracks, tears, cuts, or the like in the coating 3, there are two patterns of formation of the breathing pores 4: the breathing pores 4 formed at the time of shipping the glove 1; and the breathing pores 4 formed by using the glove 1. Therefore, the number or the opening areas of the breathing pores 4 can vary. As described in Examples 1 to 6, since the liquid resin so prepared as to make the coating 3 easily tearable or breakable forms the coating 3 (part or all of the coating 3), the breathing pores 4 are easily formed by wearing of the glove 1.

[0226] As described above, the number or the total opening area of the breathing pores 4 (unit number or unit opening area) in each part of the glove 1 depends on level of the strength of the coating 3.

[0227] Next, various examples or comparative examples for affecting the unit number or unit opening area of the breathing pores 4 will be described.

[0228] In the example, the glove 1 in which the breathing pores 4 are easily formed and in which the number or opening areas of the breathing pores 4 differs between respective parts of the glove 1 will be described. In the comparative examples, unlike the examples, a case where it is difficult to form the breathing pores 4, or a case where a difference in breathing pores 4 between parts of the glove 1 cannot be realized will be described.

(Example 1)

[0229] In the glove 1 of the example 1, the coating 3 was formed from a liquid material subjected to maturing process for a predetermined period of time. In the former for manufacturing the glove 1, the ratio of finger circumference (the ratio of the former to the standard size) was 1.0, and the ratio of palm circumference (the ratio of the former to the standard size) was 0.8. The base layer 2 was made of woolly polyester. The base layer 2 was heated to 60 °C by former temperature adjustment, dipped in a coagulant (methanol solution containing 1% calcium chloride), and dipped in a liquid material that was matured for 24 hours at 30 °C. Thereafter, the base layer 2 was dipped in a solvent (toluene), and then dried and vulcanized for 30 minutes at 110 °C, and thus the glove was formed.

[0230] In this example 1, the unit number or unit opening area of the breathing pores 4 in the palm 5 was more or larger than the unit number or unit opening area of the breathing pores 4 in the finger 6. Due to unevenness of the former for manufacturing the glove 1 and maturing of the liquid material, the difference in unit number or unit opening area could be realized.

(Example 2)

[0231] The glove 1 in the example 2 was manufactured in the following process. First, the base layer 2 (100% woolly polyester) worn on the former was dipped in a coagulant (methanol solution containing 1% calcium chloride), and then dipped in the matured liquid material. Thereafter, the based 2 was dried and dipped in a solvent (toluene solution), and the infiltrating liquid material, which was the coating 3, was swollen, and then the base layer 2 was dried for 30 minutes at 110 °C.

[0232] In the glove 1 of the example 2 thus manufactured, irregularity occurs on the coating 3, and the breathing pores 4 were easily formed by wearing the glove 1.

[0233] In addition, it is also preferred that plural kinds of liquid materials different in maturing time are preliminarily formed, and that the maturing time of the liquid material is changed according to respective parts of the glove 1. This is because, as a result, respective parts of the glove 1 have different irregularities, so that the unit number or unit opening area of the breathing pores 4 becomes different according to the parts of the glove 1.

(Example 3)

[0234] The glove 1 of the example 3 was manufactured by dipping the base layer 2 in the liquid material containing 10 vol % air bubbles. It should be understood that the liquid material may be dried after the dipping.

[0235] In the glove 1 thus manufactured of the example 3, the breathing pores 4 were easily formed by rupturing the air bubbles. In addition, it is also preferred that two types of liquid material are preliminarily prepared: a liquid material containing a large amount of air bubbles; and a liquid material containing a small amount of air bubbles, so that the amount of air bubbles in the liquid material is changed according to the part of the glove 1. This is because, in this case, the unit number or unit opening area of the breathing pores 4 can be made different according to the part of the glove.

(Example 4)

[0236] The glove 1 of the example 4 was manufactured through the process of dipping the base layer 2 in the liquid material containing 5% powder natural rubber. It should be understood that the liquid material may be dried after the dipping.

[0237] In the glove 1 manufactured according to the example 4, the breathing pores 4 could be easily formed by stress of the powder natural rubber. In addition, it is also preferred that plurality kinds of liquid material are preliminarily prepared: a liquid material having a high mixing ratio of powder natural rubber; and a liquid material having a low mixing ratio of powder natural rubber, so that the mixing ratio of powder natural rubber in the liquid material is changed according to respective parts of the glove 1. This is because, in this case, the unit

number or the unit opening area of the breathing pores 4 can be made different according to the parts of the glove.

[0238] As described above, the gloves 1 of the examples 1 to 4 makes it possible to form the breathing pores 4 easily, or to make the unit number or unit opening area different according to the parts of the glove 1.

[0239] In addition, the comparative examples for comparison to the examples 1 to 4 will be described. The comparative examples 1 to 4 resulted in a failure to form the breathing pores 4, insufficient formation of the breathing pores 4, or a difficulty in uneven formation of the breathing pores 4.

(Comparative Example 1)

[0240] The comparative example 1 was manufactured without conducting the maturing process of the liquid material.

[0241] In the glove 1 manufactured in the comparative example 1 without the maturing process of the liquid material, the breathing pores 4 could not be formed.

(Comparative Example 2)

[0242] In the comparative example 2, the glove 1 was manufactured using the former for manufacturing the glove 1 with a ratio of finger circumference (the ratio of the employed former to the standard size) of 0.8, and a ratio of palm circumference (the ratio of the employed former to the standard size) of 0.8.

[0243] In the glove 1 manufactured in the comparative example 2, the unit number or unit opening area of the breathing pores 4 in the finger 6 was similar to the unit number or unit opening area of the breathing pores 4 in the palm 5. This was because since the differences did not differ according to parts of the base layer 2, a difference in unit number or unit opening area was not generated according to the parts.

(Comparative Example 3)

[0244] In the glove 1 of the comparative example 3, the base layer 2 was made of fibers having no stretching property (for example, cotton). The rest of the glove 1 was manufactured in the same manufacturing process as the example 1.

[0245] Since the base layer 2 did not have a stretching property, the coating 3 was not stretched even when the glove 1 of the comparative example 3 was worn, and therefore the breathing pores 4 were not formed.

(Comparative Example 4)

[0246] The glove 1 of the comparative example 4 was manufactured using the former for manufacturing the glove 1 with a ratio of finger circumference (the ratio of the employed former to the standard size) of 1.0, and a

ratio of palm circumference (the ratio of the employed former to the standard size) of 1.0.

[0247] In the glove 1 of the comparative example 4, since the finger 6 and the palm 5 were not stretched by wearing of the glove 1, the breathing pores 4 were not formed.

[0248] As described above, the comparative examples 1 to 4 have the problem that the breathing pores 4 were not formed, that the breathing pores 4 were insufficiently formed, or that the breathing pores were differently formed.

(Sixth Embodiment)

15 (Communication between the breathing pores and the stitches)

[0249] When the breathing pores 4 are opened by wearing the glove 1, the breathing pores 4 opened communicate with the stitches 22 of the base layer 2, so that breathing air between the surface of the hand and the outside is achieved.

[0250] Here, the breathing pores 4 and the stitches 22 communicate with each other via relationships. FIG. 10 is a front view of a glove according to a sixth embodiment of the present invention. FIG. 10 shows a palm side where the coating 3 is formed. The glove 1 in FIG. 10 has the coating 3 on the surface of the palm, and the coating 3 has the breathing pores 4. An encircled part shows an enlarged view of the breathing pore 4 and its surroundings.

[0251] The coating 3 has a plurality of breathing pores 4. At this time, at least one of the breathing pores 4 may communicate with more than one of the stitches 22. FIG. 10 shows that one of the breathing pores 4 thus communicates with more than one of the stitches 22. Since one of the breathing pores 4 communicates with more than one of the stitches 22, the breathability increases. This is because though the breathing pores 4 provide breathability between the surface of the hand and the outside of the glove 1, communication of one of the breathing pore 4 with more than one of the stitches 22 enhances the breathing performance.

[0252] Since one of the breathing pores 4 allows air to pass through more than one of the stitches 22, the volume of breathing of an individual breathing pore 4 increases. Thus, the communication between one of the breathing pores 4 and more than one of the stitches 22 provides the advantage that the breathing performance is enhanced.

[0253] FIG. 11 is a front view of the glove according to the sixth embodiment of the present invention. In the glove 1 shown in FIG. 11, unlike the glove 1 in FIG. 10, at least one of the stitches 22 communicates with more than one of the breathing pores 4. An encircled part in FIG. 11 is an enlarged view of the breathing pores 4 and their surroundings.

[0254] As shown in the enlarged view, one of the stitch-

es 22 communicates with more than one of the breathing pores 4. This is realized when the breathing pores 4 are small. Alternatively, this is also realized when the stitches 22 are large. The breathability of the glove 1 is provided by communication between the breathing pores 4 and the stitches 22, but ultimately the openings of the breathing pores 4 control the breathing performance. Therefore, in communication of more than one of the breathing pores 4 with one of the stitches 22, each of the breathing pores 4 has low breathing performance. However, there is the advantage that the presence of many small breathing parts secures uniform breathability over the glove 1. Alternatively, since the sizes of the openings of the breathing pores 4 are relatively small, there is the advantage that the durability of the coating 3 is improved.

[0255] Since the breathing pores 4 and the stitches 22 communicate with each other in such various patterns, the breathability can be balanced with the durability or the like. It should be noted that both FIG. 10 and FIG. 11 show that the breathing pores 4 open when the glove 1 is worn, thereby communicating with the stitches 22.

[0256] In addition, the breathing pore 4 that communicates with more than one of the stitches 22, as shown in FIG. 10, and more than one of the breathing pores 4 that communicate with one of the stitches may be present in a mixed manner in one glove 1. Since various types of communications are present in a single glove 1, the glove 1 can keep breathability and durability in balance.

(Formation of the stitches)

[0257] The stitches 22 are formed by knitting the base layer 2 with fibers. A region surrounded by knitting of fibers is the stitch 22. Since the base layer 2 needs to have a stretching property, it is preferred that the fibers that form the base layer 2 also have stretch properties.

[0258] Here, it is also preferred that the base layer 2 is formed by knitting a reference yarn having a low stretching property and a yarn having a stretching property. Since the reference yarn has a low stretching property while the yarn combined with the reference yarn has a stretching property, lines having a low stretching property and high lines having a high stretching property intersect with each other. For example, when the reference yarns are used for the weft and the yarns are used for the warp, stretching directions tend to be concentrated in a vertical direction. As a result, when the base layer 2 is stretched, the stitches 22 expand easily on a basis of the reference yarns. In addition, due to the presence of the reference yarns having a low stretching property, only the yarns having a stretching property expand, so that the stitches 22 do not easily collapse. Since the stitches 22 do not easily collapse, breathing regions to communicate with the breathing pores 4 are secured.

[0259] The reference yarns may be used for the weft of the base layer 2, or may be used for the warp. In either case, as long as the reference yarns having a low stretching property is combined with the stretch yarns, the stitch-

es 22 that do not easily collapse are formed by the reference yarns.

[0260] The reference yarn is only required to be made of a material having a low stretching property, for example, bamboo fiber. Alternatively, the reference yarn may be made of wood fiber or chemical fiber having a low stretching property.

(Forming location of the coating)

[0261] The coating 3 is formed at least on the surface of the palm of the glove 1. The coating 3 provides the glove 1 with a certain waterproof property, and improves the gripping property of the glove 1. This is because the coating 3 exerts a high friction force, thereby providing the glove 1 with an anti-slip function. However, the coating 3 described in this text prevents the glove 1 from breathing air, and therefore providing the coating 3 can obtain the gripping property but deteriorates the breathability or comfort of the glove 1. The breathing pores 4 included in the coating 3 keep the breathability and comfort of the glove 1.

[0262] Here, a hand covered with the glove 1 produces sweat or water, thereby causing an uncomfortable feeling, but sweat or water is produced at various spots on the surface of a hand. Generally, when fingers of a hand are covered with a glove, a spatial volume per one finger is small, so that humidity or water easily stays in a small space (On the other hand, the spatial volume of a palm or a palm back part covered with a glove is larger, and therefore air is allowed to circulate, so that humidity or water less easily stays).

[0263] Therefore, it is also preferred that the coating 3 is not formed in such a part that sweat or water easily collects. On the other hand, in order to keep the gripping property, it is important to provide the coating 3 to where the coating 3 is needed.

[0264] FIG. 12 is a front view of a glove according to the sixth embodiment of the present invention. In the glove 1 shown in FIG. 12, the coating 3 is formed on the surfaces of fingers and a palm, except for the bases of the fingers. Since respective ones of the fingers are covered with the glove 1, as described above, inevitably sweat or water easily stays in the fingers. In particular, the base of each finger is a part where sweat or water easily collects, since sweat produced on the finger falls down and collects in the base of the finger.

[0265] On the other hand, the bases of the fingers do not need much slip resistance when a user of the glove 1 grasps an object. Therefore, the bases of the fingers without the coating 3 are less problematic in terms of the gripping property. Therefore, it is also preferred that the coating 3 is formed on the fingers (and the palm), except for the bases of the fingers. That is, the base layer 2 at the bases of the fingers is exposed. Since the coating 3 is not formed on the bases of the fingers, the exposed base layer 2 allows efficient air circulation through the stitches 22 of the base layer 2, thereby discharging sweat

or water collecting in the bases of fingers. Therefore, the user can reduce his/her uncomfortable feeling due to sweat or water that easily collects at the bases of the fingers.

[0266] It should be understood that the breathability in parts covered with the coating 3, such as a palm or fingers, can be secured by communication of the breathing pores 4 with the stitches 22.

[0267] Alternatively, as shown in FIG. 13, it is also preferred that the coating 3 is formed on the fingers (and the palm), except for not only the bases of the fingers but also the finger joints. FIG. 13 is a front view of a glove according to the sixth embodiment of the present invention.

[0268] Sweat or water collects at the finger joints as easily as in the bases of the fingers. Easy collection of sweat or water increases an uncomfortable feeling. On the other hand, as shown in FIG. 13, when the coating 3 is not formed (the base layer 2 is exposed) at the finger joints, high breathability is secured. With this high breathability, sweat or water produced at the finger joints is easily discharged to the outside of the glove 1, so that a comfortable feeling increases.

[0269] The finger joints have a roll in grasping, but are less important in grasping than the fingers or the palm. Therefore, the finger joints without the coating 3 do not affect the grip force of the entire glove 1 very much. On the other hand, as described above, high breathability at the bases of the fingers increases the comfort of the glove 1. That is, the glove 1 shown in FIG. 13 has a balance between the gripping property and the comfort.

[0270] Of course, the glove 1 may be such that the coating 3 is formed on the fingers, except for the bases of the fingers and the finger joints, or the glove 1 may be such that the coating 3 is formed except for the bases of the fingers or the coating 3 is formed except for the finger joints. The forming location of the coating 3 can be determined based on the specifications of the glove 1.

[0271] It should be noted that in order not to form the coating 3 on such parts of the glove 1 as the bases of the fingers or the finger joints, it is possible to eliminate dipping such parts in the liquid material that forms the coating 3, or to remove the coating 3 from such parts later.

[0272] As shown in FIGS. 12 and 13, by the fact that the coating 3 (exposing the base layer 2) is not provided in a part in which sweat or water particularly easily collects and which does not negatively affect the gripping property, in combination with the function of the breathing pores 4, the glove 1 which satisfies both a gripping property and breathability is realized.

[0273] In addition, in FIGS. 12 and 13, the glove 1 is described where the coating 3 is not formed in the bases of the fingers and the finger joints where sweat or water easily collects, but the glove 1 with the coating 3 thinned on these parts is also preferred. That is, the thickness of the coating 3 on the bases of the finger and the finger joints is thinner than the thickness of the coating 3 on the fingers or the palms.

[0274] This is because when the coating 3 is thinned, the breathing pores 4 are opened wider by wearing of the glove 1, so that the breathing increases. Of course, the thin coating 3 also provides the advantage that a humid feeling is reduced.

[0275] Thus, even if the coating 3 is formed on the bases of the fingers or the finger joints, as long as the thickness of the coating 3 is thinner on the bases of the fingers or the finger joints than on the other parts, it is possible to increase the usability or comfort of the glove 1.

[0276] In addition, in the fingers, sweat or water easily collects at the base of the fingers or the finger joints (this is because, as described above, sweat or water produced on the fingers falls down and collects in a depression at the bases of the fingers or the finger joints). It is also preferred that the coating 3 is not formed in the bases of the fingers or the finger joints, as shown in FIGS. 12 and 13, or that the thickness of the coating 3 is thinned, but these designs make the manufacturing process of the glove 1 complicated.

[0277] Therefore, it is also preferred that the thickness of the coating 3 on the fingers is thinner than the thickness of the coating on the palm. The fingers require the coating 3 in order to increase the gripping property. Here, the coating 3 secures breathability through the breathing pores 4. At this time, if the thickness of the coating 3 on the fingers 3 is thin, the breathing pores 4 in the fingers expand more easily, so that the breathability of the fingers increases. Of course, the thin coating 3 leads to a reduction in the humid feeling.

[0278] In addition, in the manufacturing process, it is easy to make the thickness of the coating 3 on the entire fingers thinner than the thickness of the coating 3 of the other parts. This is because it is unnecessary to change the thickness of the coating 3 according to respective parts of the glove 1.

[0279] Thus, in view of the fact that sweat or water collects easily in the finger, it is possible to design the coating 3 so that a balance between the gripping property and the breathability of the glove 1 can be optimized.

(Improvement of the gripping property)

[0280] The glove 1 utilizes the coating 3 to increase the gripping property. Therefore, the coating 3 is an element that can adjust the gripping property. The glove 1 can hold an object in the palm, or frequently pinches an object with the fingertips. Therefore, it is also preferred that the thickness of the coating 3 on the fingertips is thicker than the thickness of the coating 3 on the fingers or the palm.

[0281] If the thickness of the coating 3 on the fingertips is thick, the pressure of the fingertips against a pinched object increases. Of course, the thick coating 3 also improves durability. If the fingertips have high durability, a user can pinch an object firmly with his/her fingertips. As a result, the grip force of the fingertips further increases. Thus, the coating 3 on the fingertips thicker than the coat-

ing 3 on the other parts contributes to an improvement in the grip force.

[0282] Of course, the breathing pores 4 are also formed in the coating 3 on the fingertips to secure breathability. Since the coating 3 on the fingertips stretches in a convex fashion, the breathing pores 4 easily expand. Therefore, the breathability of the fingertips is sufficiently obtained. In addition, it is also preferred that the coating 3 on the fingertips is not only thick but also irregularity or the like is formed by the coating 3. The irregularity provides the fingertip with an anti-slip function.

(Confirmation of the opening of the breathing pore)

[0283] The breathing pores 4 expand their opening areas when the glove 1 is worn. The openings of the breathing pore 4 can secure the breathability of the glove 1. However, the breathing pores 4 are so small that the breathing pores 4 is not easily visible. Therefore, sometimes a user of the glove 1 cannot easily confirm visually whether or not the breathing pores 4 are really provided, or whether or not the breathing pores 4 are sufficiently opened when he/she wears the glove 1. Of course, even if the breathing pores 4 are not visible, there is no problem in the performance of the glove 1 as an actual product, but if the user can confirm the breathing pores 4 visually, there is the advantage that the reliability of the product increases.

[0284] It is often difficult to visually confirm the openings of the breathing pores 4 easily, but it is possible to make the user understand that the breathing pores 4 are opened.

[0285] It is preferred that the chromaticity of the base layer 2 contains a darker part than the chromaticity of the coating 3 in order to recognize the openings of the breathing pores 4. The breathing pores 4 are formed in the coating 3. The coating 3 is formed on the surface of the base layer 2, but it includes the breathing pores 4 and, when the opening areas of the breathing pores 4 increase, it becomes possible to visually confirm the color of the base 2 behind the coating 3 through the breathing pores 4. This is because when the chromaticity of the base layer 2 is darker than the chromaticity of the coating 3, the presence of many breathing pores 4 included in the coating 3 allows the color of the base layer 2 to be seen through the coating 3. That is, the color of the base layer 2 can be seen through the coating 3.

[0286] Except for a case where the coating 3 is very thin, as long as the breathing pores 4 are not formed in the coating 3, the color of the base layer 2 cannot be seen through the coating 3. On the other hand, when many breathing pores 4 are included in the coating 3, the color of the base layer 2 can be seen through the coating 3. In particular, when the chromaticity of the base layer 2 is darker than the chromaticity of the coating 3, the color of the base layer 2 can be more reliably seen through the coating 3. The statement that the chromaticity is dark means, for example, when the coating 3 is

beige or white in color, the base layer 3 is black or brown in color. In particular, when the breathing pores 4 are opened by wearing of the glove 1, the color of the base layer 2 can be further seen through the coating 3.

[0287] Thus, since the color of the base layer 2 can be seen through the coating 3, the user can notice that the breathing pores 4 are formed. Of course, when it is confirmed that the color of the base layer 2 is more clearly seen through the coating 3 after wearing of the glove 1, the user can feel the expansion of the opening areas of the breathing pores 4 by wearing of the glove 1.

[0288] As described above, since the chromaticity of the base layer 2 is darker than the chromaticity of the coating 3, the breathing pores 4 allow the color of the base layer 2 to be seen through the coating 3. Since the base layer 2 is thus seen through, the user can recognize that the breathing pores 4 are formed and that the breathing pores 4 are opened by wearing of the glove 1. Since the breathing pores 4 can be recognized, the user feels safe with the glove 1, and the provider of the glove 1 can establish the reliability of the glove 1.

[0289] In addition, not only the chromaticity of the base layer 2 is darker than the chromaticity of the coating 3, but it is also preferred that the base layer 2 has a pattern which is darker in chromaticity than the coating 3. FIG. 14 is a front view of a glove according to the sixth embodiment of the present invention. In the glove 1 in FIG. 14, the pattern of the base layer 2 is visible through the coating 3. In a case where the breathing pores 4 are included in the coating 3, the presence of the breathing pores 4 and the openings of the breathing pores 4 allow the pattern of the base layer 2 to be seen through the coating 3. This is due to the same reason as described above. That is, the pattern with dark chromaticity can be partially seen through the breathing pores 4, and is entirely visible to the user through the coating 3. In FIG. 14, polka dots 28 patterned in the base layer 2 can be seen through the coating 3. Due to the presence of the plurality of breathing pores 4 in the coating 3, the polka dots 28 are seen through the coating 3 in such a manner.

[0290] Unlike the case where only the color of the base layer 2 can be seen through the coating 3, the pattern can be easily confirmed visually even in a see-through manner. In addition, there is also the advantage that the user is amused at the appearance of the pattern of the base layer 2 through the coating 3. In addition, the fact that the pattern is more clearly seen through the coating 3 than before shows that the breathing pores 4 are getting larger than before through the use of the glove 1, or that the coating 3 is getting worn out. Therefore, the user can recognize when to replace the glove 1 based on how clearly the pattern can be seen through the coating 3.

[0291] Thus, since the chromaticity or pattern of the base layer 2 is contrasted with the chromaticity of the coating 3, the user can indirectly recognize the presence or openings of the breathing pores 4. There is also the advantage that the recognition increases the reliability of the glove 1.

[0292] As described above, the glove 1 according to the sixth embodiment can improve its usability or improve its ease of use according to the design of the glove 1.

[0293] Hereinabove, the gloves described according to the first to sixth embodiments are examples for describing the gist of the present invention, and the present invention can be modified or altered without departing from the gist of the present invention. Explanation of Reference Numerals

Claims

1. A glove comprising:

a hand-shaped base layer made of fibers having a stretching property;
a coating formed on a surface of said base layer, at least the surface of a palm of said base layer; and
a plurality of breathing pores formed in said coating, wherein
the opening area of said breathing pores when the glove is worn is larger than the opening area of said breathing pores when the glove is not worn.

2. The glove according to claim 1, wherein said base layer has a plurality of stitches, and when said breathing pores are opened by wearing the glove, the stitches and said breathing pores communicate with each other.

3. The glove according to claim 2, wherein the total opening area of the plurality of stitches is larger than the total opening area of said plurality of breathing pores when said plurality of breathing pores are opened.

4. A glove according to claim 2 or 3, wherein the opening area of one of the plurality of stitches is larger than the opening area of one of said plurality of breathing pores when the one of said plurality of breathing pores is opened.

5. A glove according to any one of claims 2 to 4, wherein the total opening area of the stitches on a palm of the glove is larger than the total opening area of the stitches on a palm back of the glove.

6. A glove according to any one of claims 1 to 5, wherein said coating is formed over substantially the whole surface of said base layer, or at least on a palm, fingers, and the bases of the fingers of said base layer in the surface of said base layer.

7. A glove according to any one of claims 1 to 6, wherein at least either one of the number of said breathing

pores per unit area (hereinafter, called "unit number") and the total opening area of said breathing pores per unit area (hereinafter, called "unit opening area") differs according to parts of the glove.

8. A glove according to claim 7, wherein at least either one of the unit number and the unit opening area in the bases of the fingers of the glove is more than or larger than at least either one of the unit number and unit opening area in the palm of the glove.

9. A glove according to claim 7, wherein at least either one of the unit number and unit opening area in the fingers of the glove is more than or larger than at least either one of the unit number or unit opening area in the palm of the glove.

10. A glove according to claim 9, wherein the size of a finger of a former for manufacturing a glove is smaller than a standard size thereof, and the size of a palm of the former is equal to or larger than a standard size thereof.

11. A glove according to claim 7, wherein at least either one of the unit number and the unit opening area in the fingers of the glove is less than or smaller than at least either one of the unit number and the unit opening area in the palm of the glove.

12. A glove according to claim 11, wherein the size of the finger of a former for manufacturing a glove is equal to or larger than a standard size thereof, and the size of a palm of the former is smaller than a standard size thereof.

13. A glove according to any one of claims 1 to 12, wherein said breathing pores are formed by at least either one of rupturing air bubbles contained in said coating and attaching particles to said coating according to a step of dipping said coating in a solvent.

14. A glove according to any one of claims 1 to 13, wherein the fingers of the glove are in a bent state to the side of the palm when the glove is not worn.

15. A glove according to any one of claims 2 to 14, wherein at least one of said plurality of breathing pores communicates with more than one of the stitches when the glove is worn.

16. A glove according to any one of claims 2 to 14, wherein at least one of the plurality of stitches communicates with more than one of said breathing pores when the glove is worn.

17. A glove according to any one of claims 2 to 16, wherein the stitches are formed by knitting reference yarns having a low stretching property and yarns having a

stretching property.

18. A glove according to claim 17, wherein the reference yarns include bamboo fibers. 5
19. A glove according to any one of claims 1 to 18, wherein said coating is formed on the surfaces of the fingers and the palm, excluding at least part of the bases of the fingers and finger joints of the glove. 10
20. A glove according to any one of claims 1 to 19, wherein the thickness of said coating on the bases of the fingers and the finger joints of the glove is thinner than the thickness of said coating on the fingers and the palm of the glove. 15
21. A glove according to any one of claims 1 to 19, wherein the thickness of said coating on the fingers of the glove is thinner than the thickness of said coating on the palm. 20
22. A glove according to any one of claims 1 to 19, wherein the thickness of said coating on fingertips of the glove is thicker than the thickness of said coating on at least either one of the fingers and the palm. 25
23. A glove according to any one of claims 1 to 22, wherein the chromaticity of said base layer contains darker part than the chromaticity of said coating. 30
24. A method for manufacturing the glove according to any one of claims 1 to 23, comprising:
- dipping a surface of said hand-shaped base layer made of fibers having a stretching property, at least the surface of the palm, in a coagulant; 35
- dipping the surface of said base layer, at least the surface of the palm, in a mixed liquid containing at least either one of air bubbles and particles; 40
- dipping said coating in a solvent to swell said coating; and
- drying said coating. 45

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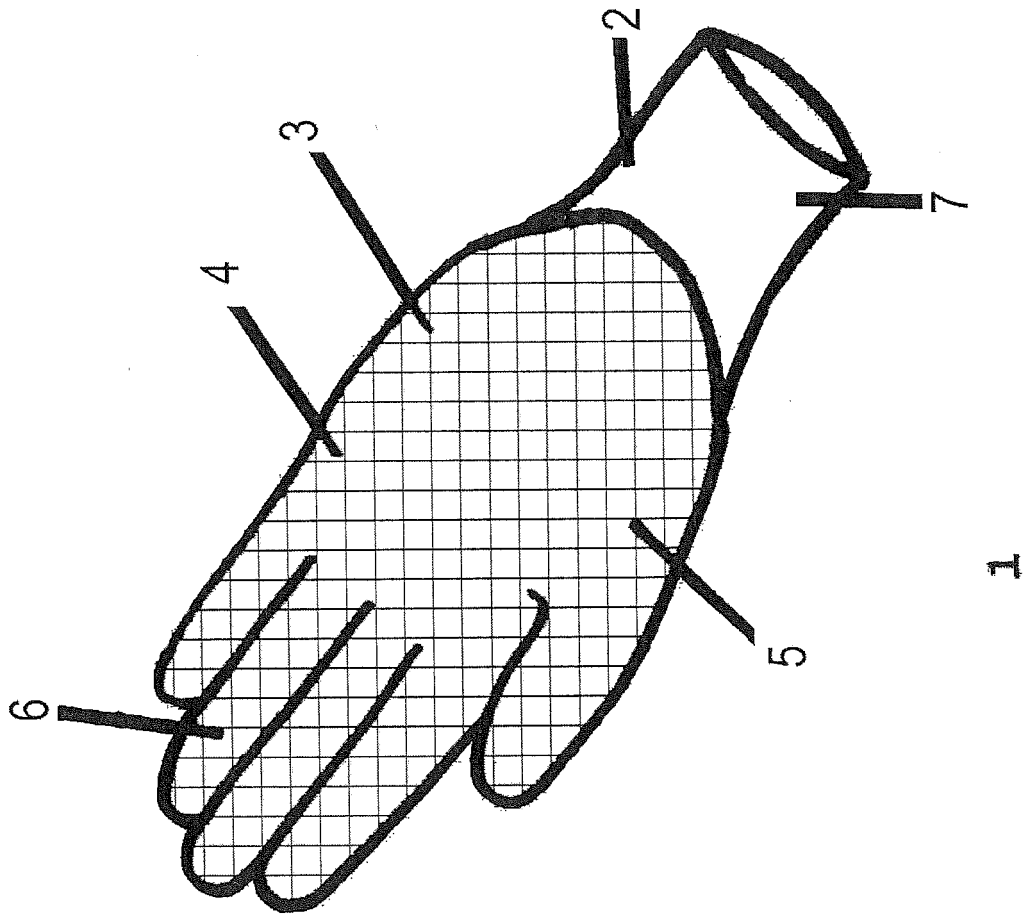
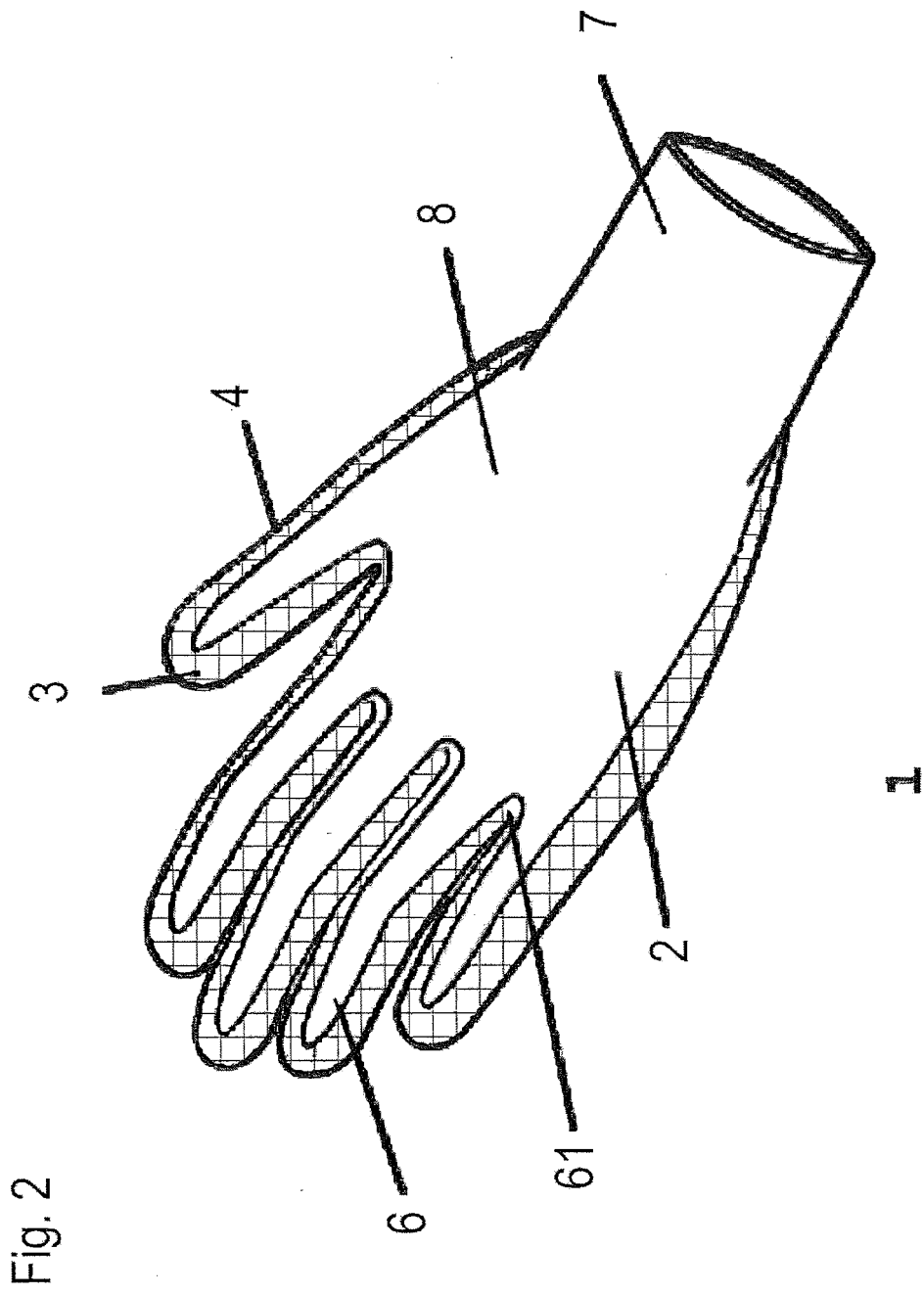


Fig. 1



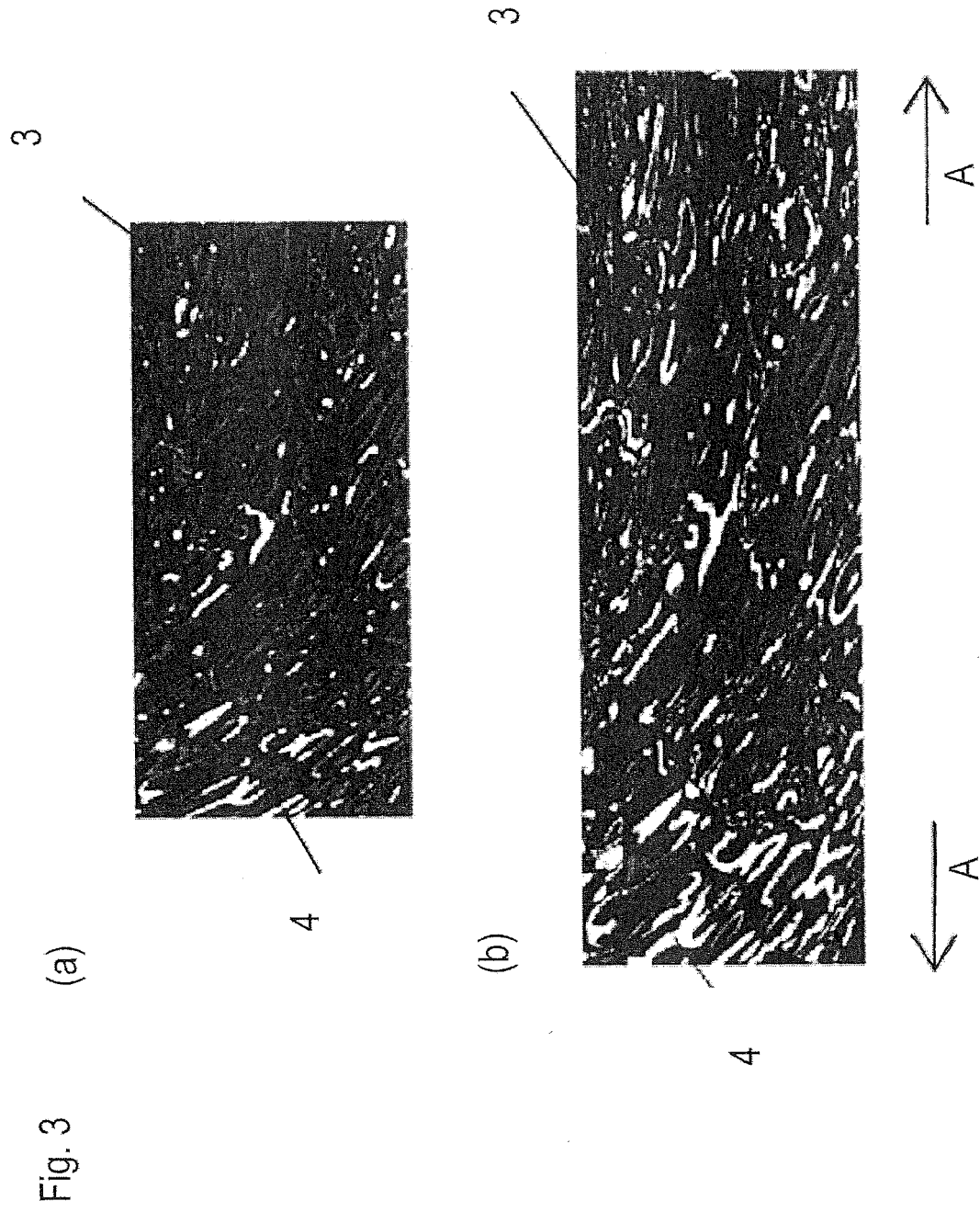
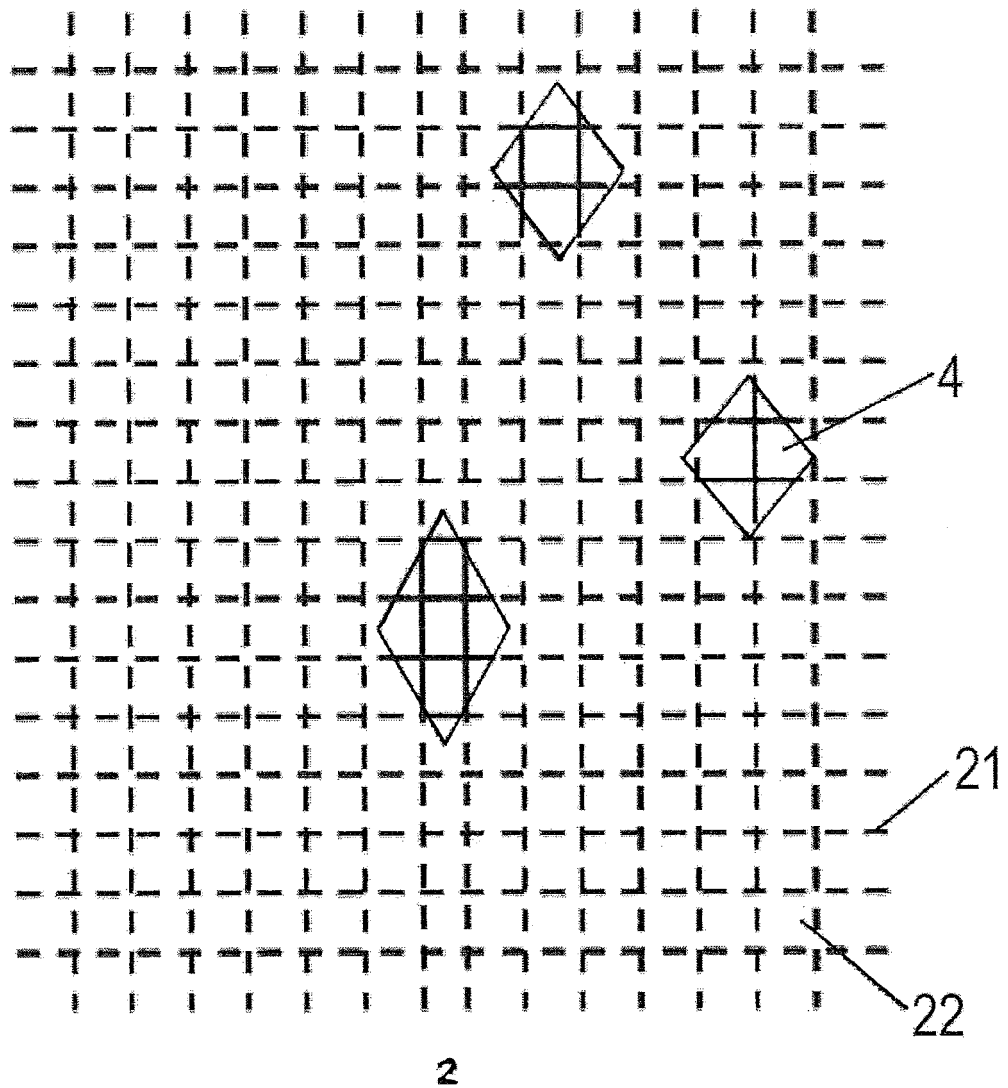


Fig. 4



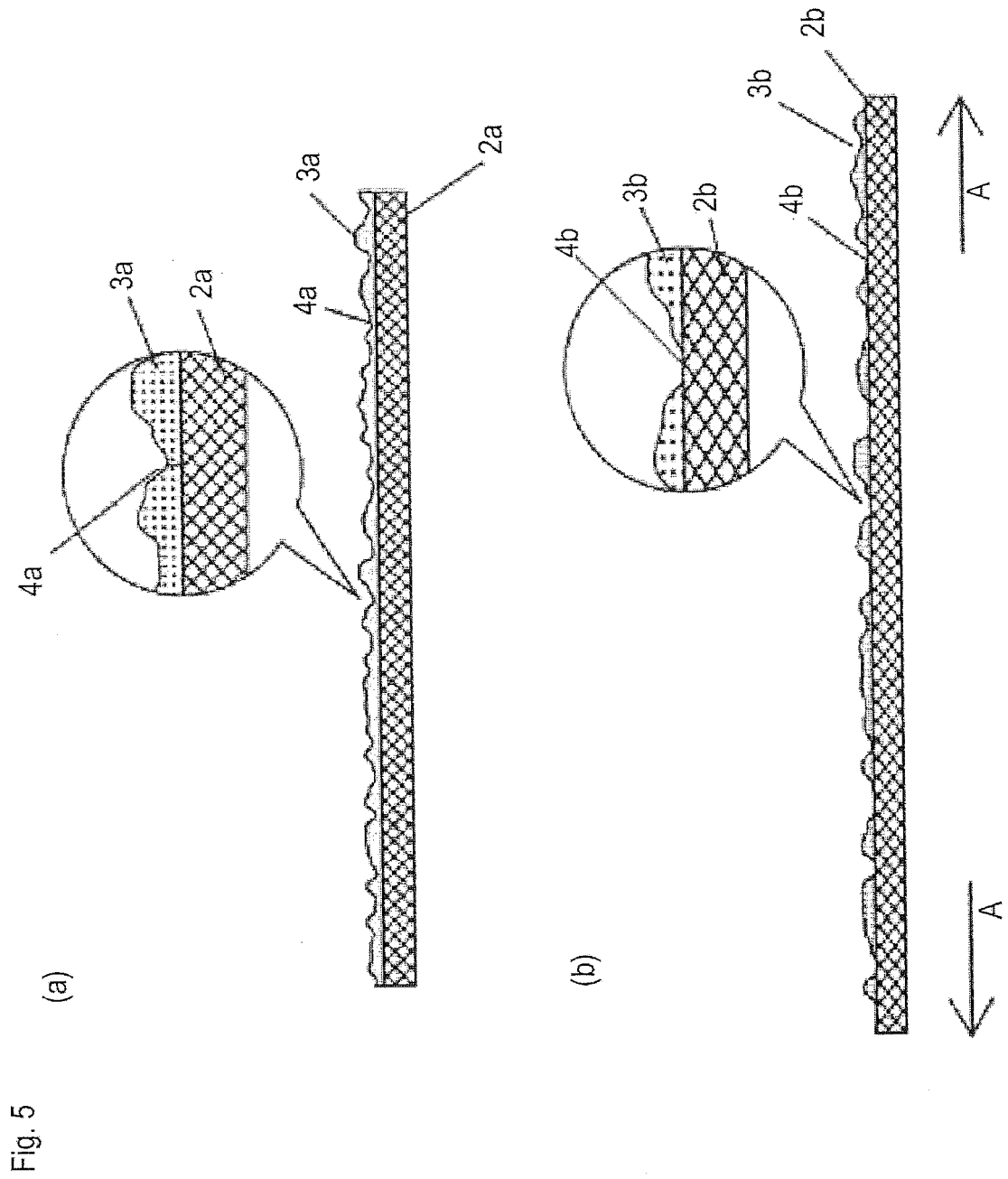


Fig. 6

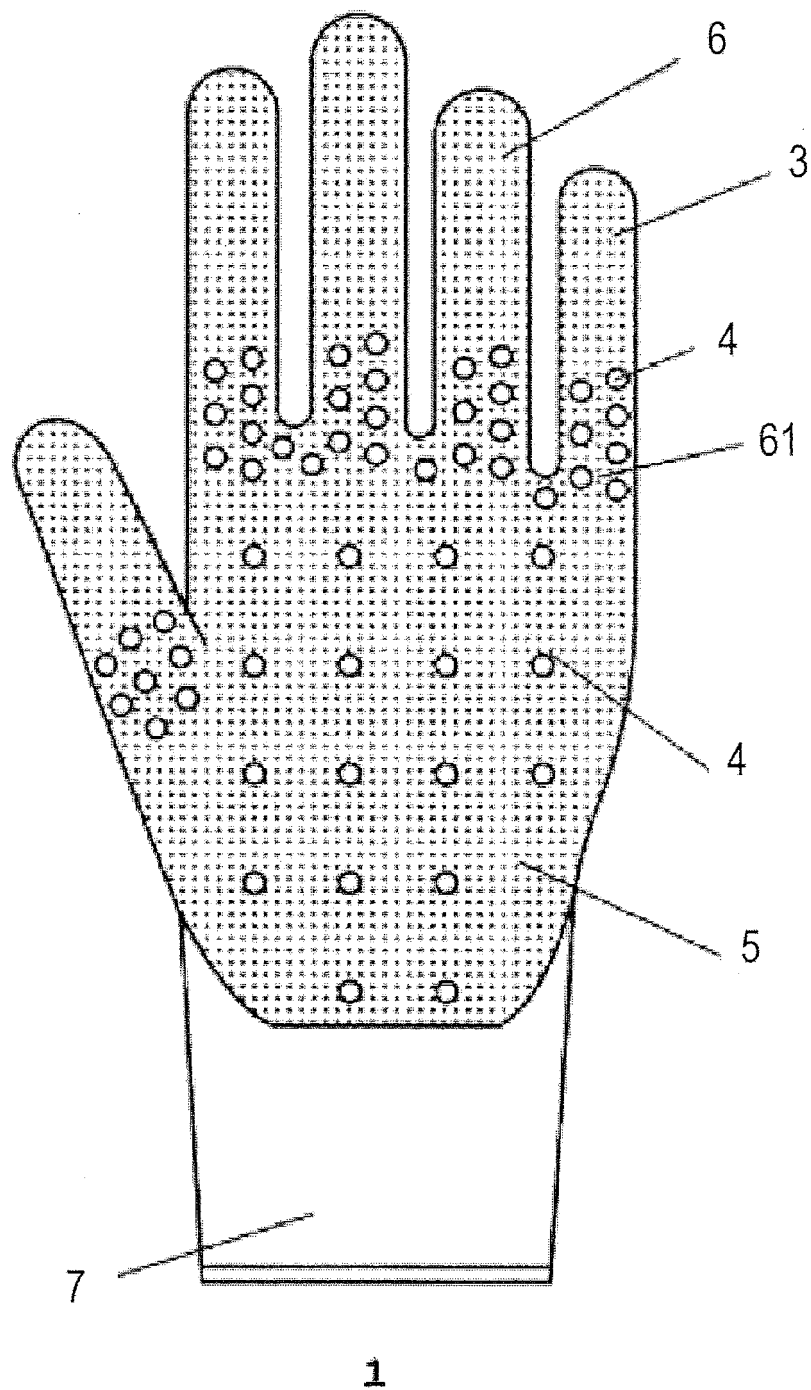
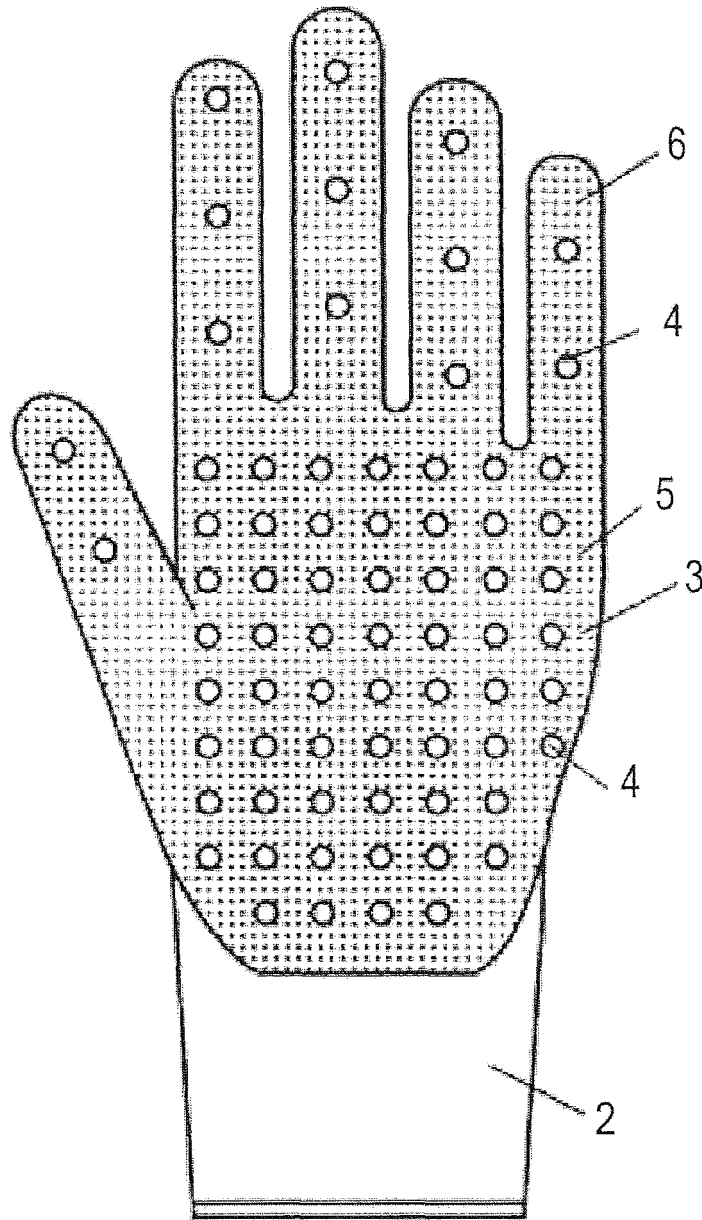
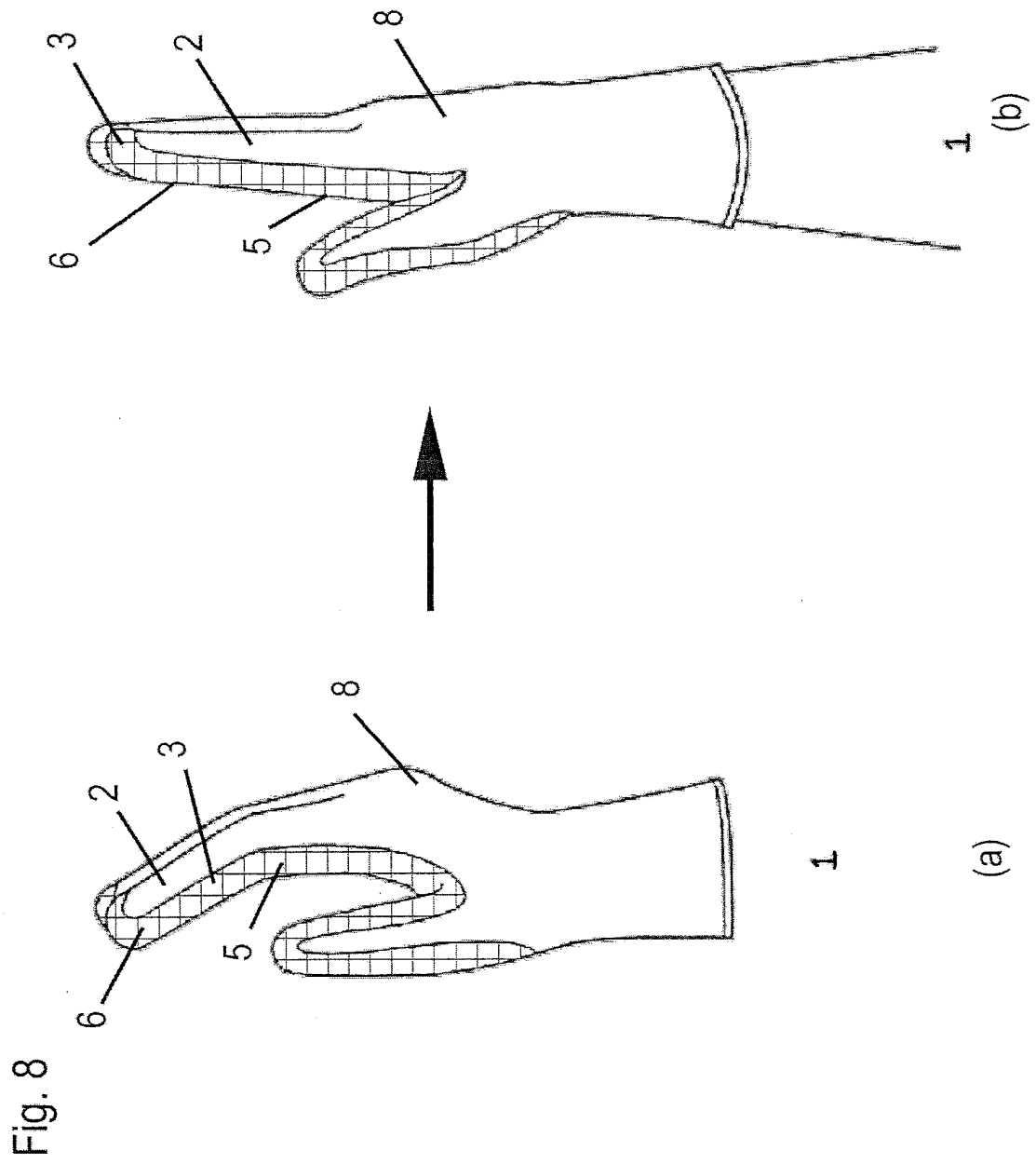


Fig. 7



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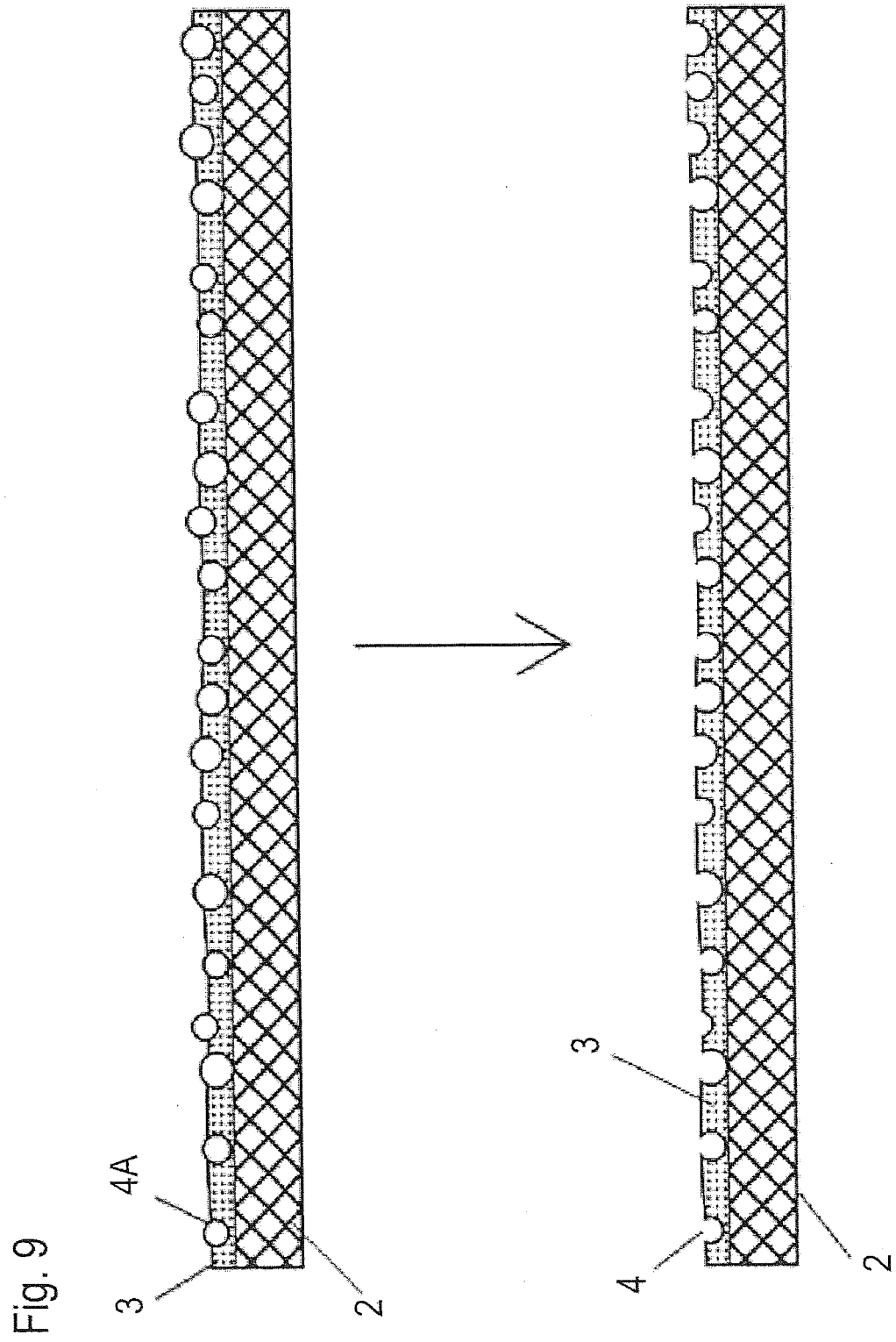


Fig. 10

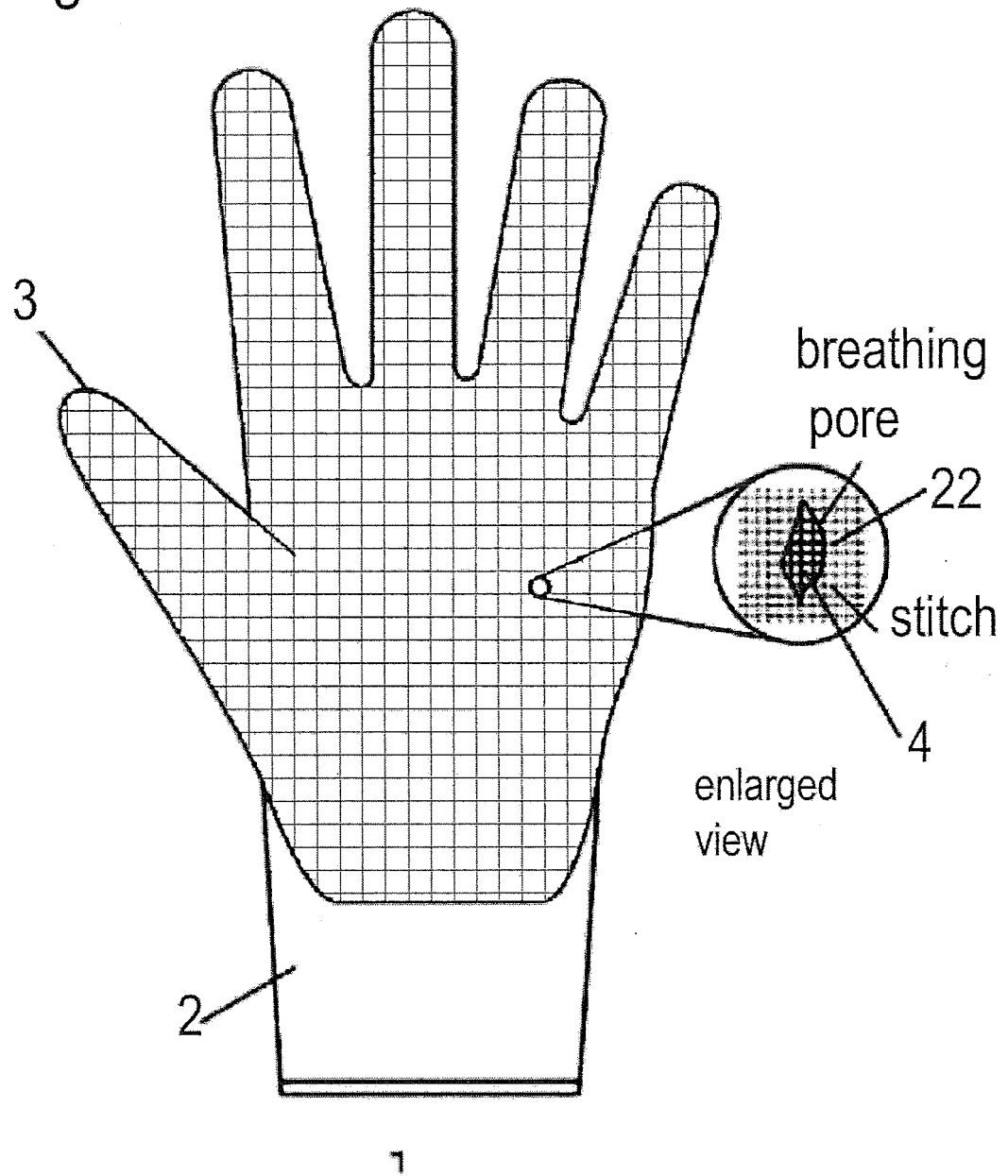


Fig. 11

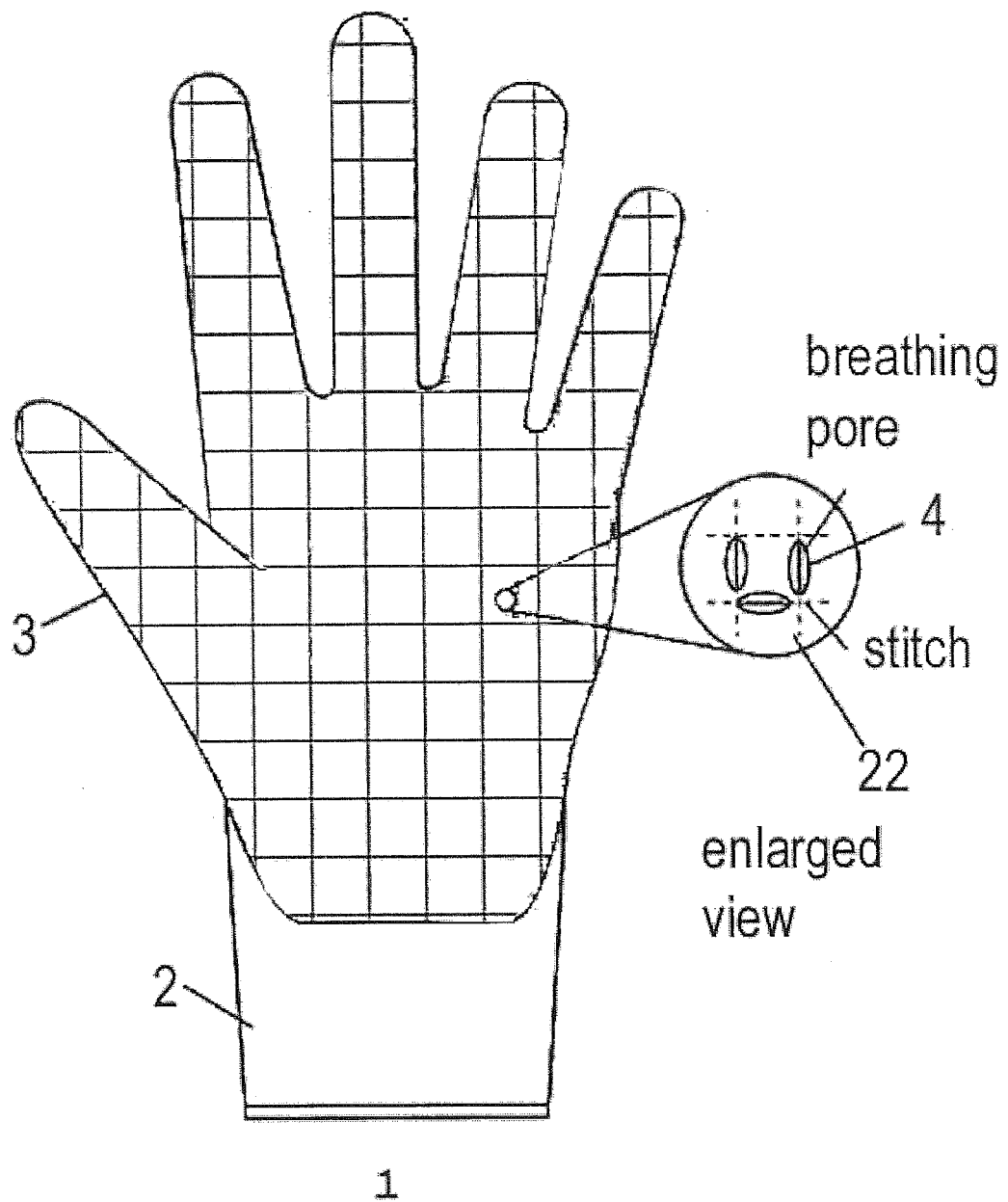


Fig. 12

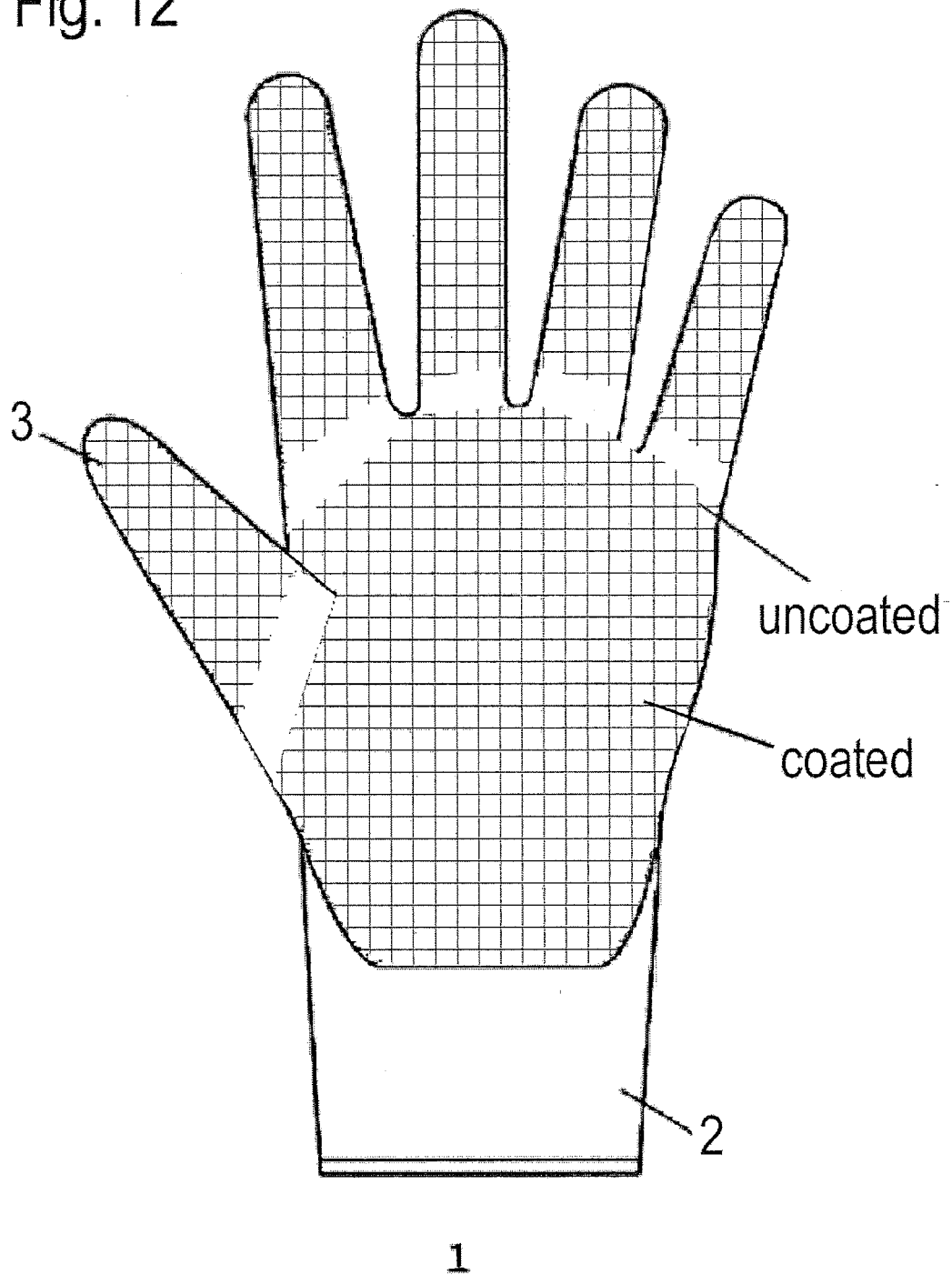


Fig. 13

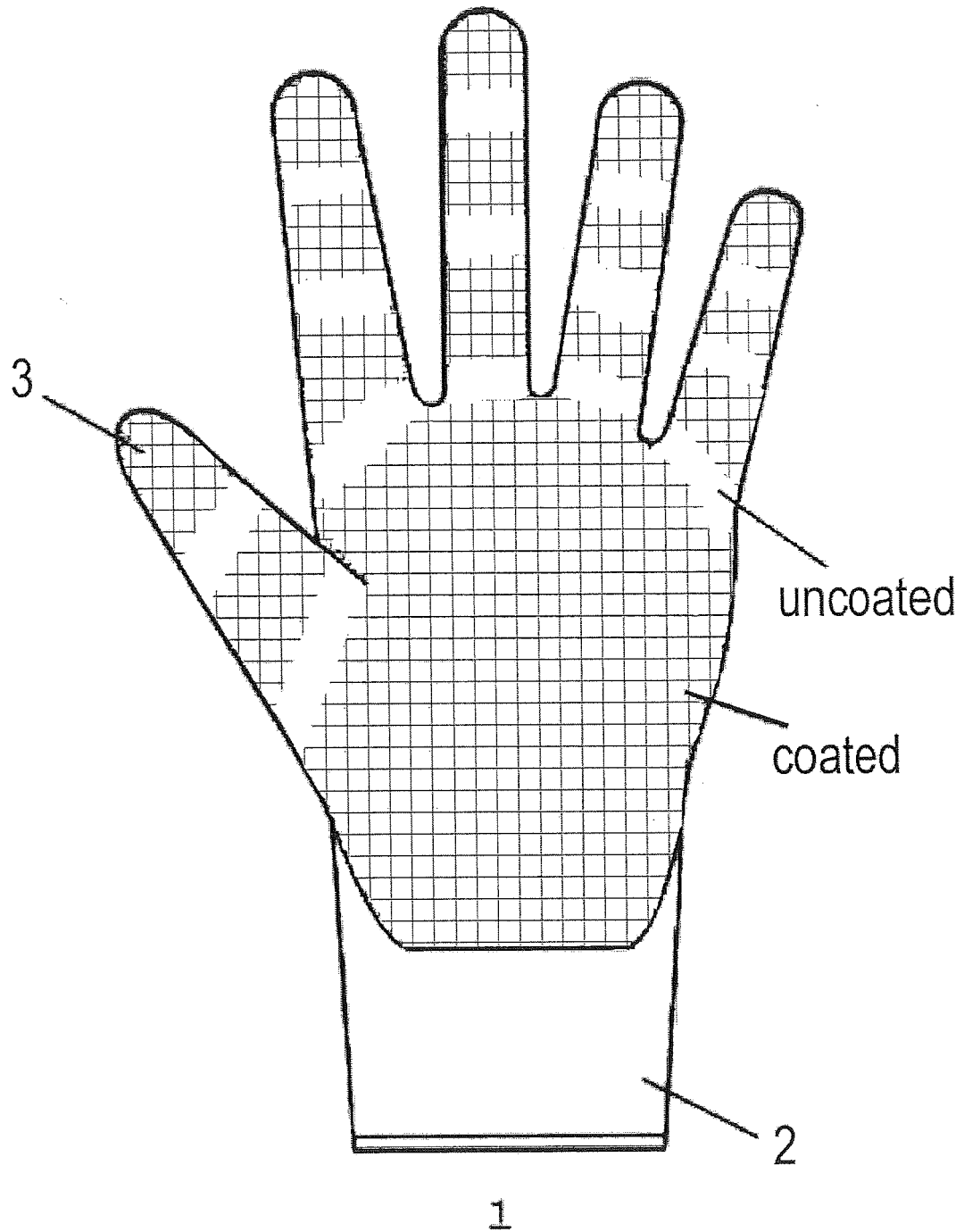
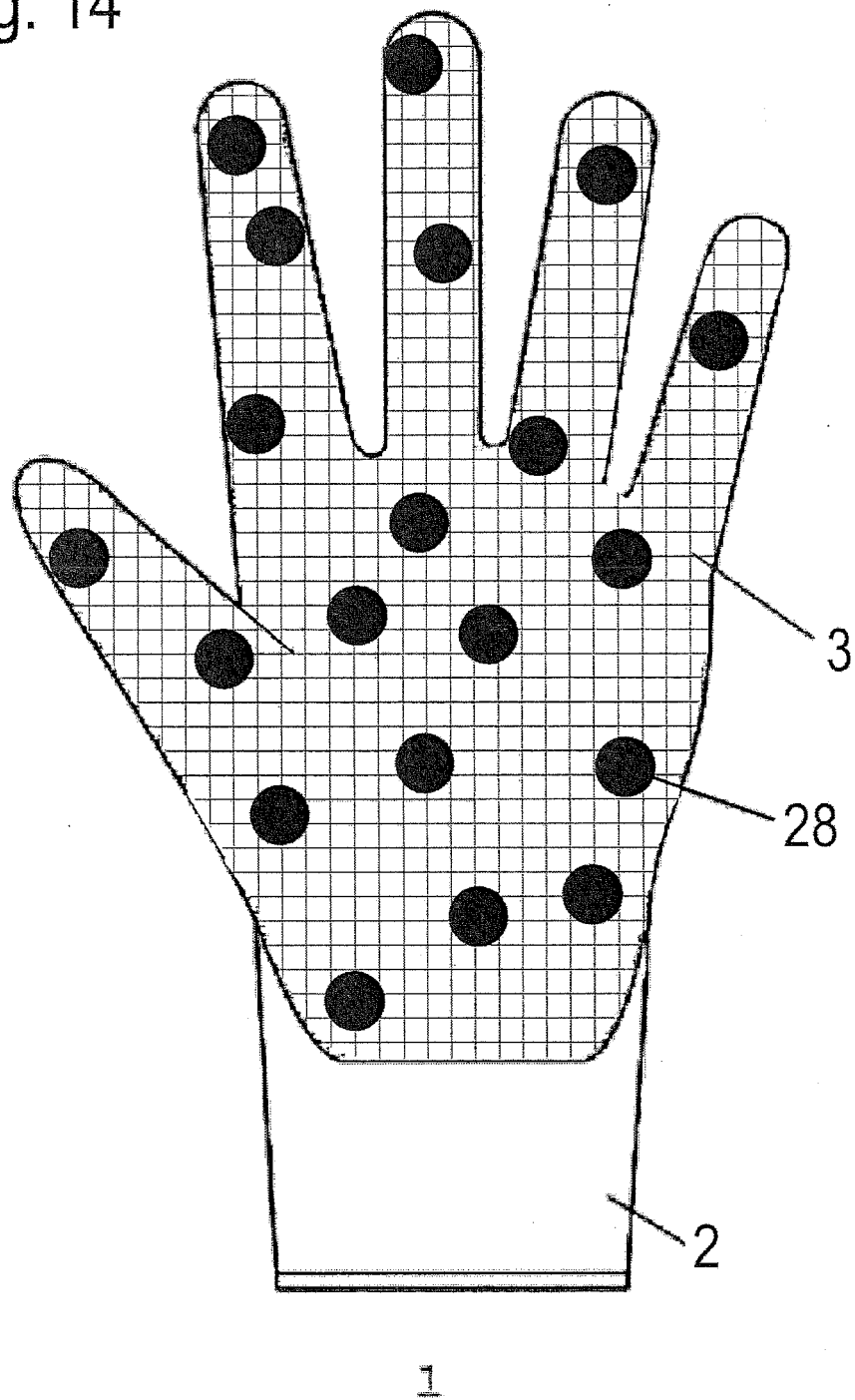


Fig. 14



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/071469

A. CLASSIFICATION OF SUBJECT MATTER

A41D19/00 (2006.01) i, A41D19/04 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A41D19/00, A41D19/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2011
 Kokai Jitsuyo Shinan Koho 1971-2011 Toroku Jitsuyo Shinan Koho 1994-2011

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 2002-129418 A (North Kasei Industry Co., Ltd.), 09 May 2002 (09.05.2002), paragraphs [0001], [0019] to [0020], [0027] to [0030]; fig. 6 (Family: none)	1-9, 11, 13-24 10, 12
Y A	JP 10-53908 A (Chubu Bussan Boeki Co., Ltd.), 24 February 1998 (24.02.1998), paragraphs [0013] to [0015]; fig. 3 (Family: none)	1-9, 11, 13-24 10, 12
Y	JP 11-509281 A (Acushnet Co.), 17 August 1999 (17.08.1999), page 10, lines 10 to 22 & US 5708979 A & EP 874560 A1 & WO 1998/019568 A1	1-9, 11, 13-24

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search
16 December, 2011 (16.12.11)Date of mailing of the international search report
27 December, 2011 (27.12.11)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/071469

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 11-140714 A (Shinyei Industry Co., Ltd.), 25 May 1999 (25.05.1999), claims 1 to 2; paragraphs [0009] to [0010]; fig. 1 to 2 (Family: none)	19-23
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