DESCRIPTION

WRISTBAND AND METHOD OF MANUFACTURING THE SAME

Technical Field

[0001]

The present invention relates to wristbands and methods of manufacturing the same, and in particular to a wristband for identifying a patient in fields such as medical fields by attaching the wristband around the patient's wrist or ankle, and a method of manufacturing such a wristband.

Background Art

[0002]

Conventionally, it is possible to identify a hospitalized patient by attaching a medical-use wristband having full name, birth date, sex, and other necessary information of the patient written or printed around the wrist or the ankle to allow identification of the patient in an examination or a treatment. However, when a hospitalization period is extended, for example 2 to 3 months, and if the wristband itself is not very durable, let alone problems of deformation of the wristband and hygiene issues, problems arise such as a practical trouble of losing indicated information and failure in reading of the information.

[0003]

However, as the wristband inevitably comes into contact with the patient's skin, it is required that the wristband be soft as much as possible with minimum skin irritation.

Of course, as it is not possible to manage the personal information if the wristband is intentionally removed, it is required that the wristband has a tensile strength so as not to be easily cut, and enough toughness so that the wristband itself must be cut in order to be removed when using a fixation clip to attach to a portion-to-be-attached. It is also required that the wristband may not be flexed or curved and may have the indication information remain for certain so as to allow bar codes and other contents to be readable even in a long-term use. Further, there is a problem that various conflicting properties such as water resistance, oil resistance, grease resistance, and lightweight properties that may possibly have a user forget wearing the wristband as the wristband is light and soft are required in a long-term attachment.

Citation List

Patent Literature

[0004]

Patent Literature 1: Japanese Unexamined Patent Application Publication No. 2002-363808

Summary of Invention

Technical Problem

[0005]

The present invention has been made in view of the above problems, and an object of the present invention is to provide a wristband having improved toughness, water resistance, and oil resistance or grease resistance while maintaining softness, as well as a method of manufacturing such a wristband.

[0006]

Another object of the present invention is to provide a wristband that may not be flexed or curved and have the indication information remain for certain even so as to allow bar codes and other contents to be readable even in a long-term use, as well as a method of manufacturing such a wristband.

[0007]

Another object of the present invention is to provide a light and soft wristband that may provide a sense of light-fitting so as to have a user forget wearing the wristband and may reduce an influence of the worn portion to the skin, as well as a method of manufacturing such a wristband.

[0008]

Another object of the present invention is to provide a wristband that is flexible and has large tensile strength, and with which breathability of a contact surface for the skin may be ensured, as well as a method of manufacturing such a wristband.

Solution to Problem

[0009]

Specifically, the present invention focuses on an application of a laminated material including a first water resistant oil resistant material (e.g., polypropylene), a flexible material (e.g., ethylene-vinyl acetate copolymer), and a second water resistant oil resistant material (e.g., polypropylene) to a surface base material that is most susceptible to an external factor out of materials that constitute a wristband, on an application of an interlining material (e.g., oriented nylon) disposed on a lower side of the surface base material and having one of tearing resistance and tensile resistance. Thus, a first aspect of the invention provides a wristband capable of indicating identification information on a belt-like band base material, and attachable around a portion-to-be-attached such as the wrist or the ankle, wherein the band base material includes: a surface base material configured by a laminated material having a first water resistant oil resistant material, a flexible material, and a second water resistant oil resistant material that are laminated; an interlining material laminated on a lower side of the surface base material and having one of tearing resistance and tensile resistance; and an embossed material laminated on a lower side of the interlining material and having

an embossed portion for making contact with the portion-to-be-attached.

[0010]

A second aspect of the invention provides a method of manufacturing a wristband capable of indicating identification information on a belt-like band base material, and attachable around a portion-to-be-attached such as the wrist or the ankle, wherein the band base material is formed by: laminating an interlining material having one of tearing resistance and tensile resistance over a front surface of an embossed material having, on a back surface thereof, an embossed portion allowed to be in contact with the portion-to-be-attached; and laminating a surface base material over a front surface of the interlining material, the surface base material being configured by a laminated material having a first water resistant oil resistant material, a flexible material, and a second water resistant oil resistant material that are laminated.

[0011]

A surface treatment for allowing printing of the identification information may be applied to a front surface of the surface base material, and then a cutoff line may be provided in the band base material, thereby allowing the wristband to be cut out as a single strip.

[0012]

A surface treatment for allowing printing of the identification information may be applied to a front surface of the surface base material.

[0013]

The surface base material may be configured such that a ratio between lamination thicknesses of the first water resistant oil resistant material, the flexible material, and the second water resistant oil resistant material is about 1:8:1.

[0014]

The surface base material may be configured such that polypropylene is used for the first water resistant oil resistant material, ethylene-vinyl acetate copolymer is used for the flexible material, and polypropylene is used for the second water resistant oil resistant material.

[0015]

The interlining material may be made of oriented nylon.

[0016]

The embossed portion of the embossed material may include a spherical portion having one of a circular sectional shape and an oval sectional shapes.

[0017]

The embossed portion of the embossed material may include a spherical portion having one of a circular sectional shape and an oval sectional shapes, and the spherical portion may be

larger than a triangular crista cutis of a skin of the portion-to-be-attached.

[0018]

The band base material may be configured such that a specific gravity of the band base material as a whole is smaller than 1 by appropriately adjusting the thicknesses and the materials of the surface base material and the interlining material.

Advantageous Effects of Invention

[0019]

According to the wristband and the method of manufacturing the same of the present invention, the band base material is configured by the laminated material including the first water resistant oil resistant material, the flexible material, and the second water resistant oil resistant material, and the interlining material having tearing resistance or tensile resistance. Therefore, it is possible to provide water resistance and oil resistance due to the first water resistant oil resistant material and the second water resistant oil resistant material, and toughness due to tearing resistance or tensile resistance of the interlining material while ensuring flexibility due to the flexible material of the laminated material. With this, it is possible to provide appropriate

properties for attachment to the hospitalized patient's wrist or ankle.

[0020]

In particular, according to the wristband of the first aspect of the invention, the laminated material including the first water resistant oil resistant material, the flexible material, and the second water resistant oil resistant material is laminated over the front surface of the interlining material having tearing resistance or tensile resistance, and the embossed material is laminated over the back surface of the interlining material. Therefore, it is possible to provide a configuration having flexibility, water resistance, oil resistance, toughness, tearing resistance or tensile resistance, and breathability to the skin that are required for the wristband.

[0021]

In particular, according to the method of manufacturing a wristband of the second aspect of the invention, the band base material is formed by: laminating the interlining material having one of tearing resistance and tensile resistance over the front surface of the embossed material having, on the back surface thereof, the embossed portion allowed to be in contact with the portion-to-be-attached; and laminating the surface base material over the front surface of the interlining material, the surface base material being configured by the laminated

material having the first water resistant oil resistant material, the flexible material, and the second water resistant oil resistant material that are laminated. Therefore, it is possible to manufacture a wristband having various required properties.

Brief Description of Drawings

[0022]

Fig. 1 is a plan view illustrating a wristband 1 according to an embodiment of the present invention.

Fig. 2 is an enlarged sectional view of the same taken along line II-II in Fig. 1.

Fig. 3 is an enlarged backside view of an embossed material 15 of the same.

Fig. 4 is an enlarged illustrative view of the same showing correlation between a spherical portion 22 of an embossed portion 21 of the embossed material 15 and a triangular crista cutis 23 of the skin of a portion-to-be-attached.

Fig. 5 is a schematic side view of the same illustrating a wristband manufacturing apparatus 30 for manufacturing the wristband 1 (a wristband continuous body 1A).

Description of Embodiment

[0023]

According to the present invention, a wristband having various required properties and a method of manufacturing such a wristband are realized by employing a laminated material including a first water resistant oil resistant material, a flexible material, and a second water resistant oil resistant material and an interlining material having tearing resistance or tensile resistance to constitute a band base material.

Example

[0024]

Next, the wristband and the method of manufacturing the same according to an embodiment of the present invention will be described with reference to Fig. 1 through Fig. 5. Fig. 1 is a plan view illustrating a wristband 1, and Fig. 2 is an enlarged sectional view taken along line II-II in Fig. 1. The wristband 1 is able to indicate identification information on a surface of a belt-like band base material 2, and may be attached around a portion-to-be-attached (not depicted) such as a hospitalized patient's wrist or ankle in the form of a ring.

[0025]

The band base material 2 includes an elongated annular cutoff line 3 in order to allow cutting of the wristband 1 of a single strip out from the band base material 2. Further, a plurality the wristbands 1 connected by separation lines 4 such as perforation constitute a belt-like wristband continuous body

1A. Here, a cut out instruction 5 saying "peel off here", an indication saying "print direction →", and the like are printed in advance at one arc-like end 1B (a left end in Fig. 1) of the wristband 1. A part of the cutoff line 3 at the one arc-like end 1B is a through cutoff line 3A that penetrates through the band base material 2 from its front surface to back surface, and the remaining part of the cutoff line 3 is a semi-through cutoff line 3B (see Fig. 2). Accordingly, it is possible to eliminate a defect of unintentional separation when unused or when mounted on a predetermined printer (such as a thermal transfer printer, not depicted) and printed while transfer, and to facilitate separation in use.

[0026]

The wristband 1 is provided with a print area 6 in its center along the length, and a first wrapping portion 7 and a second wrapping portion 8 on left and right of the print area 6. The first wrapping portion 7 includes an attachment hole 9 of a required number (2 in the illustrated example), and the second wrapping portion 8 includes a plurality of selection holes 10 of a required number (8 in the illustrated example) in a penetrating manner. The wristband 1 may be attached around the portion-to-be-attached by fixing the attachment hole 9 and the selection holes 10 by a predetermined fixation clip 11. It should be noted that a mark for position detection 12 is printed on a back surface of the wristband 1 in advance in order to allow

detection of a position of the wristband 1 when mounted on the printer and printed while transfer.

[0027]

As illustrated in particular in Fig. 2, the band base material 2 includes a surface base material 13, an interlining material 14, and an embossed material 15.

[0028]

The surface base material 13 is configured by a laminated material 19 in which a first water resistant oil resistant material 16, a flexible material 17, and a second water resistant oil resistant material 18 are laminated. As the first water resistant oil resistant material 16, polypropylene (PP) subjected to a corona treatment is performed is used, for example. As the flexible material 17, ethylene-vinyl acetate copolymer (EVA) is used, for example. As the second water resistant oil resistant material 18, polypropylene (PP) is used, for example. Here, a front surface of the surface base material 13 is subjected to a surface treatment 20 such that identification information can be printed on the front surface and that the printed information is permanently durable.

[0029]

The surface treatment 20 is to apply a predetermined coating depending on types and characteristics of an ink or an ink ribbon used in the predetermined printer. Examples of an agent for the surface treatment include surface treatment

agents such as a polyester-based, polyurethane-based, or epoxy-based acrylic resin, varnish for printing ink, and a medium agent. Further, in order to improve readability of a bar code and printed letters, it is desirable to add a pigment such as titanium oxide so as to provide a white background and to adjust its white color density (PSC value) to be 75 or greater.

[0030]

The interlining material 14 is tearing-resistant or tensile-resistant and laminated on a lower side of the surface base material 13. Examples include a soft and durable materials, for example, versatile film base materials such as nylon, polyethylene terephthalate (PET), polypropylene (PP), and polyethylene (PE), and the interlining material 14 is preferably configured by oriented nylon (biaxially-oriented nylon).

[0031]

The embossed material 15 is an emboss film made from polyethylene, for example, and laminated on a lower side of the interlining material 14. Its back side is a portion that is in direct contact with a surface of the skin, such as the patient's wrist or ankle, and includes an emboss pattern (an embossed portion 21) of various types of concavo-convex pattern provided by extrusion of any method in order to ensure breathability to the skin to dry sweat or moisture. In order to ensure breathability and to reduce skin irritation as much

as possible, a sectional shape of the emboss pattern of the embossed portion 21 is circular or oval. It should be noted that while an inorganic or zinc-oxide-based antimicrobial agent is impregnated in order to maintain cleanliness of the skin surface, it is necessary to select an antimicrobial agent that is safe as much as possible as this portion is in direct contact with the skin. Further, while there is a case in which an additive such as an antioxidizing agent or lubricant is added in manufacturing polyethylene, it is desirable to use additive-free polyethylene considering probability that a user of the wristband 1 may have allergies.

[0032]

Fig. 3 is an enlarged backside view of the embossed material 15, and Fig. 4 is an enlarged illustrative view showing correlation between a spherical portion 22 of the embossed portion 21 of the embossed material 15 and the triangular crista cutis 23 of the skin of the portion-to-be-attached. Specifically, as the embossed portion 21 has the spherical portion 22 whose sectional shape is circular or oval, and the spherical portion 22 is larger than the triangular crista cutis 23 of the skin (see a hatched portion in Fig. 4), this prevents the embossed portion 21, when abutting the skin of the portion-to-be-attached at a predetermined pressure, from crossing the skin and giving irritation directly to a sulcus cutis 23A between the triangular cristae cutis 23, and skin

irritation while wearing may be reduced. Further, a too large (too wide) concave portion in the embossed portion 21 gives an influence to printing on a surface portion (a part of the surface treatment 20) due to a head pressure when the printer prints on the wristband 1. Therefore, it is necessary to limit the size and the pitch of the embossed portion 21 such that a range the spherical portion 22 is about 300 μm to 1500 μm, including a case in which the spherical portion 22 is circular or oval. For example, provided that the sectional shape is oval, the size of the spherical portion 22 of the embossed material 15 at its bottom section is desirably such that a length along a short axis is on the order of 300 μm and a length along a long axis is on the order of 500 μm, and a length of a gap between the spherical portions 22 (concave portions) is on the order of 50 μm to 300 μm.

[0033]

Referring back to Fig. 2, the second water resistant oil resistant material 18 of the laminated material 19 and the interlining material 14 are adhered by a first adhesive layer 24 such as polyethylene, and the interlining material 14 and the embossed material 15 are adhered by a second adhesive layer 25 such as polyethylene.

[0034]

In the wristband 1 (the band base material 2), thicknesses of the surface treatment 20, the surface base material 13 (the

laminated material 19: the first water resistant oil resistant material 16, the flexible material 17, and the second water resistant oil resistant material 18), the first adhesive layer 24, the interlining material 14, the second adhesive layer 25, and the embossed material 15 are as shown below. However, a tolerance on the order of ±10% is permissible for each value. The surface treatment 20: 1 μm to 10 μm (e.g., 5 μm), the surface base material 13 (the laminated material 19): 100 μm to 200 μm (e.g., 150 μm), the first water resistant oil resistant material 16: 10 μm to 20 μm (e.g., 15 μm), the flexible material 17: 80 μm to 160 μm (e.g., 120 μm), the second water resistant oil resistant material 18: 10 μm to 20 μm (e.g., 15 μm), the first adhesive layer 24: 10 μm to 20 μm (e.g., 15 μm), the interlining material 14: 15 μm to 50 μm (e.g., 25 μm), the second adhesive layer 25: 10 μm to 20 μm (e.g., 15 μm), the embossed material 15: 100 μm to 160 μm (e.g., 130 μm), and a total thickness of the wristband 1: 250 μm to 445 μm (e.g., 300 μm to 340 μm). It should be noted that for the laminated material 19 of the surface base material 13, a ratio between lamination thicknesses of the first water resistant oil resistant material 16, the flexible material 17, and the second water resistant oil resistant material 18 is 0.5-2:6-9:0.5-2 (e.g., about 1:8:1).

[0035]

Further, a specific gravity of the wristband 1 (the band base material 2) as a whole is set to be smaller than 1 by

appropriately adjusting the thicknesses and the materials of the surface base material 13 and the interlining material 14. By setting the specific gravity of the wristband 1 as a whole is to be smaller than 1, it is possible to manufacture the wristband 1 that is light enough to float on water, and provide a sense of light-fitting so as to have a user forget wearing the wristband. In the wristband 1, specific gravities of the resins used for the surface base material 13 (the laminated material 19: the first water resistant oil resistant material 16, the flexible material 17, and the second water resistant oil resistant material 18), the first adhesive layer 24, the interlining material 14, the second adhesive layer 25, and the embossed material 15 are as shown below, for example. Polypropylene (PP): 0.90 to 0.91, ethylene-vinyl acetate copolymer (EVA): 0.92 to 0.94, polyethylene (PE): 0.92 to 0.97, and nylon: 1.02 to 1.14. It should be noted that while the specific gravity of nylon exceeds 1, it is possible to suppress the specific gravity of the wristband 1 as a whole to be smaller than 1 by appropriately designing the thicknesses of the respective layers as the proportion of nylon to the total thickness of the wristband 1 is small.

[0036]

When the hospitalized patient is treated within a hyperbaric oxygen treatment room, there is a risk of a short-circuit spark is caused by static electricity due to a

friction between the clothes and the wristband 1. In order to prevent such a short-circuit spark, it is desirable to apply or mix an antistatic agent to or in at least one of the surface treatment 20, the laminated material 19 (the first water resistant oil resistant material 16, the flexible material 17, and the second water resistant oil resistant material 18), the interlining material 14, and the embossed material 15. Thus, even while wearing the wristband 1, the antistatic agent prevents electrostatic charging from being generated, and the patient is able to receive a treatment safely in the hyperbaric oxygen treatment room. Examples of the antistatic material to be used include a material obtained by dispersing an appropriate amount of conductive carbon black, black lead, metal oxide, or a surfactant-based electrical conducting material in a vinyl-chloride-based, vinyl-acetate copolymer-based, acrylic-based, urethane-based, or polyamide-based resin.

[0037]

The wristband 1 (the wristband continuous body 1A) described above may be manufactured by joining the constituting layers together using an extrusion lamination method or a dry lamination method.

[0038]

Fig. 5 is a schematic side view illustrating a wristband manufacturing apparatus 30 for manufacturing the wristband 1 (the wristband continuous body 1A). The wristband

manufacturing apparatus 30 includes an embossed material molding device 31, a laminated material laminating device 32, and a wristband laminating device 33.

[0039]

The embossed material molding device 31 provides the embossed material 15 by extruding a film material of the embossed material 15 so as to form the embossed portion 21 on the back surface of the material through a pair of extrusion rollers 34.

[0040]

The laminated material laminating device 32 provides the laminated material 19 by laminating the first water resistant oil resistant material 16, the flexible material 17, and the second water resistant oil resistant material 18 through lamination rollers 35.

[0041]

In the wristband laminating device 33, a material for the first adhesive layer 24 is supplied from a first adhesive supply tank 36 to join the embossed material 15 and the interlining material 14, and a material for the second adhesive layer 25 is supplied from a second adhesive supply tank 37 to join the laminated material 19 to an upper side of the interlining material 14. Then, a surface treating device 38 performs the surface treatment 20, a printing device 39 prints the cut out instruction 5 saying "peel off here", an indication saying

"print direction →", the mark for position detection 12, and the like in advance, an cutting line forming device 40 forms the cutoff line 3 and the separation line 4, and whereby the belt-like wristband continuous body 1A from which a single strip of the wristband 1 may be cut out is manufactured.

[0042]

Thus, it is possible to manufacture the wristband 1 that is light, soft, and having required toughness even when attached to the hospitalized patient's wrist or ankle for an extended period of time. The wristband 1 allows high-quality and high-resistant printing by a printer, and gives no discomfort and little sense of wearing even when attached to the hospitalized patient for an extended period of time. The product shape of the wristband 1 may not be deformed to the end, and the information of the patient is maintained perfectly readable without losing any information.

Reference Signs List

[0043]

1: Wristband (Embodiment, Fig. 1, and Fig. 2)

1A: Wristband Continuous Body of Wristbands 1

1B: One Arc-Like End of Wristband 1

2: Band Base Material

3: Cutoff Line

3A: Through Cutoff Line of Cutoff Line 3

3B: Semi-Through Cutoff Line of Cutoff Line 3

4: Separation Line

5: Cut out Instruction

6: Print Area

7: First Wrapping Portion

8: Second Wrapping Portion

9: Attachment Holes

10: Selection Holes

11: Fixation Clip

12: Mark for Position Detection

13: Surface Base Material (Fig. 2)

14: Interlining material

15: Embossed Material

16: First Water resistant oil resistant Material

17: Flexible Material

18: Second Water resistant oil resistant Material

19: Laminated Material

20: Surface Treatment

21: Embossed Portion

22: Spherical Portion of Embossed Portion 21

23: Triangular Crista Cutis of Skin (Fig. 4)

23A: Sulcus Cutis between Triangular Cristae Cutis 23

24: First Adhesive Layer

25: Second Adhesive Layer

30: Wristband Manufacturing Apparatus (Fig. 5)

31: Embossed Material Molding Device

32: Laminated Material Laminating Device

33: Wristband Laminating Device

34: Extrusion Rollers

35: Lamination Rollers

36: First Adhesive Supply Tank

37: Second Adhesive Supply Tank

38: Surface Treating Device

39: Printing Device

40: Cutting Line Forming Device

CLAIMS

1. A wristband capable of indicating identification information on a belt-like band base material, and attachable around a portion-to-be-attached such as the wrist or the ankle, wherein

the band base material includes:

a surface base material configured by a laminated material having a first water resistant oil resistant material, a flexible material, and a second water resistant oil resistant material that are laminated;

an interlining material laminated on a lower side of the surface base material and having one of tearing resistance and tensile resistance; and

an embossed material laminated on a lower side of the interlining material and having an embossed portion for making contact with the portion-to-be-attached.

2. The wristband according to claim 1, wherein

a surface treatment for allowing printing of the identification information is applied to a front surface of the surface base material.

3. The wristband according to claim 1 or 2, wherein

the surface base material is configured such that a ratio between lamination thicknesses of the first water resistant oil resistant material, the flexible material, and the second water resistant oil resistant material is about 1:8:1.

4. The wristband according to one of claims 1 to 3, wherein

the surface base material is configured such that polypropylene is used for the first water resistant oil resistant material, ethylene-vinyl acetate copolymer is used for the flexible material, and polypropylene is used for the second water resistant oil resistant material.

5. The wristband according to one of claims 1 to 4, wherein

the interlining material is made of oriented nylon.

6. The wristband according to one of claims 1 to 5, wherein

the embossed portion of the embossed material includes a spherical portion having one of a circular sectional shape and an oval sectional shapes.

7. The wristband according to one of claims 1 to 6, wherein

the embossed portion of the embossed material includes a spherical portion having one of a circular sectional shape and an oval sectional shapes, and

the spherical portion is larger than a triangular crista cutis of a skin of the portion-to-be-attached.

8. The wristband according to one of claims 1 to 7, wherein

a specific gravity of the band base material as a whole is smaller than 1.

9. A method of manufacturing a wristband capable of indicating identification information on a belt-like band base material, and attachable around a portion-to-be-attached such as the wrist or the ankle, wherein

the band base material is formed by:

laminating an interlining material having one of tearing resistance and tensile resistance over a front surface of an embossed material having, on a back surface thereof, an embossed portion allowed to be in contact with the portion-to-be-attached; and

laminating a surface base material over a front surface of the interlining material, the surface base material being configured by a laminated material having a first water resistant oil resistant material, a flexible material, and a

second water resistant oil resistant material that are laminated.

10. The method of manufacturing a wristband according to claim 9, wherein

a surface treatment for allowing printing of the identification information is applied to a front surface of the surface base material, and then a cutoff line is provided in the band base material, thereby allowing the wristband to be cut out as a single strip.