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(71) Applicant: **Shiotsu, Zenjiro**  
**Hiroshima-shi, Hiroshima 732-0811 (JP)**

(72) Inventor: **Shiotsu, Zenjiro**  
**Hiroshima-shi, Hiroshima 732-0811 (JP)**

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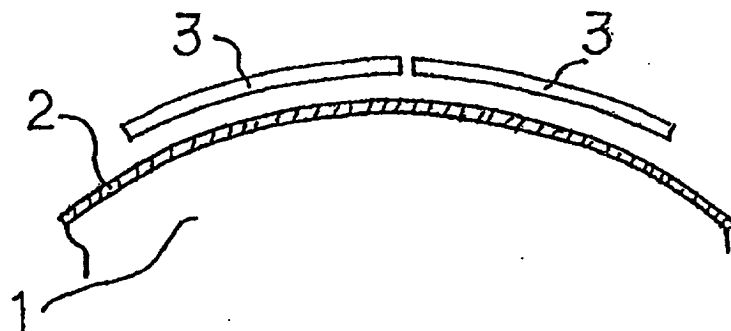
(74) Representative: **Jenkins, Peter David et al**  
**PAGE WHITE & FARRER**  
**54 Doughty Street**  
**London WC1N 2LS (GB)**

(54) **METHOD FOR ADHESION OF SURFACE SKIN OF BALL**

(57) A method for adhering a surface skin of a ball, which uses a means that is free of solvent and involves no solvent, and which is friendly to the environment, creates no odor, poses no danger of fire attributable to catalysts, eliminates the solvent drying time and space that would otherwise be required, and requires no particular skill. In a ball, an adhesive layer 2 is provided on the outer surface of a carcass 1, and a surface skin 3 is

placed over the adhesive layer 2; or the adhesive layer 2 is provided on the inner surface of the surface skin 3, and the surface skin 3 is placed over the carcass 1; and adhesion is performed using a means free of solvent. Here, the carcass 1 includes the adhesive layer 2 provided over a tube 1a or includes a reinforcing layer 4 provided over the tube 1a, and the adhesive layer 2 provided over the reinforcing layer 4.

**FIG. 1**



## Description

### Technical Field

**[0001]** The present invention relates to a method for adhering a surface skin of a ball.

### Background Art

**[0002]** Conventional balls used for sports include a bonded ball in which a surface skin is provided on a reinforcing layer, a rubber ball in which a rubber layer is provided on a reinforcing layer, and a stitched ball in which a surface skin and a valve portion are fixed together.

**[0003]** On the insides of these balls is what is known as a carcass, comprising a rubber member called a tube, which has a valve and holds the air inside to become spherical when filled with air, and a reinforcing layer, which covers the tube.

**[0004]** A surface skin is bonded over this carcass by way of using a solvent. But the use of a solvent for this purpose accompanies several problems. There is a solvent odor and the danger of fire, which creates an unhealthy working environment; and the solvents take time to dry, take up space while drying, and require adjustment of the viscosity, which requires considerable skill.

**[0005]** In view of this, the present invention discloses and provides a method for adhering a surface skin of a ball, which supplants conventional methods for adhering a ball surface skin, and which does not use a solvent, that is, which performs adhesion by a means that is free of solvent; and it is, therefore, friendly to the environment, results in no odor, poses no risk of fire attributable to solvents, eliminates the solvent drying time and space that would otherwise be required, and requires no special skill.

### Disclosure of Invention

**[0006]** With the present invention, in adhering a ball surface skin, an adhesive layer is provided on either the surface skin or the carcass, and the carcass and surface skin are adhered together. The carcass is such that either an adhesive layer is provided over a tube, or a reinforcing layer is provided over a tube and an adhesive layer is provided over the reinforcing layer, while the adhesive layer is selected from an adhesive film, a thermal adhesion film, a powdered adhesive agent, and a non-solvent adhesive agent.

### Brief Description of the Drawings

**[0007]**

Fig. 1 is a partially omitted cross sectional view of an embodiment of the present invention.

Fig. 2 is a partially omitted cross sectional view of another embodiment of the present invention.

Fig. 3 is a partially omitted cross sectional view of yet another embodiment of the present invention.

**[0008]** As for the reference numerals used in all the drawings, 1 is a carcass, 1a is a tube, 2 is an adhesive layer, 3 is a surface skin, and 4 is a reinforcing layer.

### Best Mode for Carrying Out the Invention

**[0009]** An embodiment of the present invention will now be described with reference to Fig. 1, which illustrates a method for adhering a surface skin of a ball. In a ball, an adhesive layer 2 is provided on the outer surface of a carcass 1, and a surface skin 3 is placed over the adhesive layer 2; or the adhesive layer 2 is provided on the inner surface of the surface skin 3, and the surface skin 3 is placed over the carcass 1; and then adhesion of the surface skin to the carcass is performed by a means that is free of solvent.

**[0010]** As shown in Fig. 2, the carcass 1 comprises the adhesive layer 2 provided over a tube 1a; or, as shown in Fig. 3, it comprises a reinforcing layer 4 provided over the tube 1a, and the adhesive layer 2 provided over the reinforcing layer 4.

**[0011]** Further, the adhesive layer 2 used in the present invention is selected from an adhesive film, a thermal adhesion film, a powdered adhesive agent, and a non-solvent adhesive agent.

**[0012]** The surface skin 3 is made from natural leather, synthetic leather, natural rubber, synthetic rubber, natural sponge rubber, synthetic sponge rubber, natural fabric, synthetic fabric, or the like.

### Industrial Applicability

**[0013]** Because an adhering means that requires no solvent is used in the present invention, a uniform adhesive layer is obtained on the carcass and surface skin; and when an adhesive film is used for the adhesive layer, the carcass and surface skin are adhered together. The adhesive film can be punched out in any shape desired, and there is no oozing of solvent; and since no solvent is used, it is also friendly to the environment, creates no odor, poses no danger of fire attributable to catalysts, and eliminates the solvent drying time and space that would otherwise be required.

**[0014]** Also, because the adhering means that requires no solvent is employed, there is no need to deal with changes over time in the relationship between the solvent and the adhesive layer as in the past, nor is there any danger of curing modification; and therefore no particular skill is required, which lowers the cost entailed. Thus, the present invention is extremely beneficial in terms of both safety and ease of work.

**Claims**

1. A method for adhering a surface skin of a ball, comprising the steps of providing an adhesive layer on an outer surface of a carcass and placing a surface skin over said adhesive layer, or providing an adhesive layer on an inner surface of a surface skin and placing said surface skin over a carcass; and then performing adhesion with a means that is free of solvent. 5  
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2. The method for adhering a surface skin of a ball according to Claim 1, wherein the carcass is produced by either providing an adhesive layer over a tube or providing a reinforcing layer over a tube and providing an adhesive layer over said reinforcing layer. 15
3. The method for adhering a surface skin of a ball according to Claim 1, wherein the adhesive layer is one selected from an adhesive film, a thermal adhesion film, a powdered adhesive agent, and a non-solvent adhesive agent. 20
4. The method for adhering a surface skin of a ball according to Claim 1, wherein the means free of solvent is heating, pressing, or rubbing. 25

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FIG. 1

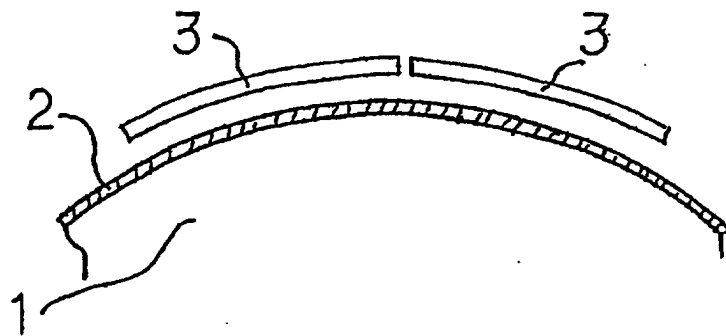


FIG. 2

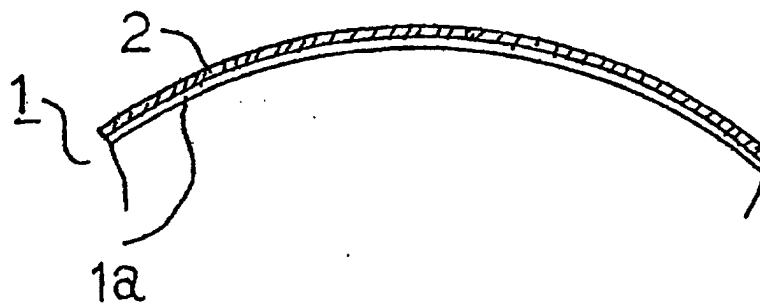
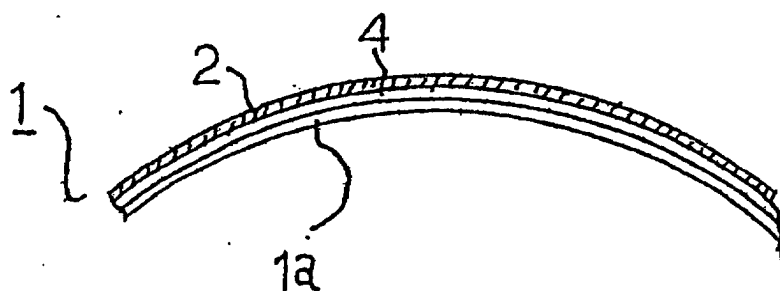


FIG. 3



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/03132

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. <sup>7</sup> A63B45/00		
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) Int.Cl. <sup>7</sup> A63B45/00		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2002 Kokai Jitsuyo Shinan Koho 1971-2002 Jitsuyo Shinan Toroku Koho 1996-2002		
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	EP 14040 A1 (Albany International Corp.), 06 August, 1980 (06.08.80), Full text; Figs. 1 to 4 & JP 55-122567 A Full text; Figs. 1 to 4 & US 4241118 A & CA 1133532 A	1-4
Y	JP 60-225581 A (Morten Corp.), 09 November, 1985 (09.11.85), Full text; Figs. 1 to 6 (Family: none)	1-4
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 10 April, 2002 (10.04.02)		Date of mailing of the international search report 23 April, 2002 (23.04.02)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

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