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(54) **COMPOSITION FOR LUBRICATING CLIMBING SHOES AND RELATED USE, METHOD AND SPRAYING DEVICE**

(57) The invention refers to a composition comprising 35% v/v to 85% v/v of a C1-C4 alcohol, 2% v/v to 60% v/v of a lubricant, H₂O, and preferably excipients. The invention also refers to a use of the composition for lubricating climbing shoes, a method for lubricating climbing shoes using the composition and a spraying device

containing the composition. The advantages of the composition according to the invention are that it facilitates the introduction of the foot of a user in the climbing shoe and improves the user experience wearing the climbing shoes.

EP 4 186 964 A1

Description

Field of the invention

[0001] The invention relates to a composition for lubricating climbing shoes. The invention also relates to a use of a composition for lubricating climbing shoes. The invention further relates to a method for lubricating climbing shoes. The invention also relates to a spraying device for lubricating climbing shoes.

State of the art

[0002] Climbing shoes are a very technical and specialized type of footwear. This requires them to be worn tightly, often very tightly, to optimally perform their function, for example down to 3 or 4 sizes less than the usual size for a user.

[0003] This generates several problems:

- It is often very hard to introduce the foot in the climbing shoe.
- When the foot is introduced in the climbing shoe, toes are often placed in a wrong position generating intense pain and cramps for the user and negatively affecting his performance.
- The user experience, from the first use of the climbing shoe until it becomes "comfortable", usually as a result of the shoe deforming and adapting to the foot of the user (commonly known as "breaking in the shoe"), is very painful and very unpleasant.

[0004] In this context, currently, only home-made solutions to improve the user experience are available, such as soaking the climbing shoes in warm water, applying heat or cold to the shoes before putting them on, or wearing them using a plastic bag as a sock, and none of these achieve optimal results.

[0005] Therefore, there is the need to provide a solution to the above-mentioned problems, particularly to facilitate the putting on and wearing of climbing shoes and improve the user experience and performance when doing so.

Summary of the invention

[0006] It is an object of the invention to provide a composition for climbing shoes that lubricates the climbing shoe and allows for an improved user experiences when putting it on and wearing it.

[0007] This purpose is achieved by a composition of the type indicated at the beginning, characterized in that it comprises 35% v/v to 85% v/v of a C1-C4 alcohol, 2% v/v to 60% v/v of a lubricant, H₂O, and, preferably, excipients. Preferably the lubricant is a liquid lubricant.

[0008] Preferably, this purpose can also be achieved by a composition of the type indicated at the beginning, characterized in that it comprises 55% v/v to 85% v/v of

a C1-C4 alcohol, 2% v/v to 40% of a lubricant, H₂O, and, preferably, excipients. More preferably, the composition comprises 65% v/v to 85% v/v of said alcohol; and 2% v/v to 25% v/v of said lubricant, and still more preferably it comprises 65% v/v to 85% v/v of a said C1-C4 alcohol and 2% v/v to 15% v/v of a said lubricant.

[0009] In the context of the invention, "% v/v" is to be understood as "percent volume of the component/volume of the total composition".

[0010] The composition according to the invention can be applied on the inside of a climbing shoe, particularly on the inner surface of the climbing shoe. While wet, the composition according to the invention lubricates the inside of the climbing shoe facilitating the introduction of the foot of the user in the shoe and allowing for the correct positioning of the toes in the same. Once the foot has been introduced in the climbing shoe and the toes are correctly placed, the alcoholic fraction of the composition according to the invention, and the water fraction, if any, evaporate, drying the interior of the climbing shoe and allowing it to recover its grip, thus ensuring that the climbing shoe remains in place on the foot and the foot does not slide out from the shoe during use.

[0011] The invention further includes several preferred features that are object of the dependent claims and the utility of which will be highlighted hereinafter in the detailed description of preferred embodiments of the invention.

[0012] Preferably, said composition comprises 70% v/v to 80% v/v of said alcohol.

[0013] Using 70% v/v to 80% v/v of the C1-C4 alcohol is advantageous to obtain an adequate interaction of the composition with the footwear and an adequate drying out of the climbing shoe so it recovers its grip once the foot has been placed inside.

[0014] Preferably, said composition comprises 4% v/v to 10% v/v of said lubricant.

[0015] Using 4% v/v to 10% v/v of said lubricant is advantageous to obtain an adequate lubrication of the inner surface of the shoe upon application of the composition.

[0016] More preferably, said composition comprises 70% v/v to 80% v/v of said alcohol and 4% v/v to 10% v/v of said lubricant.

[0017] Using between 70% v/v and 80% v/v of the C1-C4 alcohol and between 4% v/v and 10% v/v of the lubricant is further advantageous to obtain an adequate interaction of the composition with the footwear and an adequate lubrication of the footwear, particularly of the inner surface of the footwear while wet upon application of the composition, as well as for obtaining an adequate drying out time after the foot has been inserted in the climbing shoe, so the shoe recovers the grip.

[0018] Preferably, said composition comprises 75% v/v of said alcohol.

[0019] Using 75% v/v of the C1-C4 alcohol is further advantageous to obtain an optimal interaction of the composition with the footwear and results in an optimal wet/dry time upon application, allowing an optimal lubri-

cation while the inner surface of the shoe is wet and an optimal grip recovery once the foot has been inserted in the climbing shoe and the interior surface of the shoe dries out.

[0020] But it is possible to increase the amount of lubricant, up to 60% v/v, which further improves the lubrication of the climbing shoe without negatively impacting on its performance. So, preferably, said composition comprises 2% v/v to 60% v/v of said lubricant.

[0021] Preferably, said composition comprises 2% v/v to 40% v/v of said lubricant.

[0022] Preferably, said composition comprises 2% v/v to 25% v/v of said lubricant. More preferably, said composition comprises 2% v/v to 15% v/v of said lubricant or said composition comprises 15% v/v to 25% v/v of said lubricant.

[0023] Using 2% v/v to 25% v/v of lubricant allows to obtain an optimal interaction of the composition with the footwear and results in an optimal wet/dry time upon application, allowing an optimal lubrication while the inner surface of the shoe is wet and an optimal grip recovery once the foot has been inserted in the climbing shoe and the interior surface of the shoe dries out.

[0024] More preferably, said composition comprises 15% v/v to 25% v/v of said lubricant.

[0025] Using more than 15% v/v of said lubricant and less than 25% v/v of said lubricant is further advantageous, allowing a further optimal lubrication while the inner surface of the shoe is wet and maintaining an optimal interaction of the composition with the footwear and an optimal wet/dry time upon application, and an optimal grip recovery once the foot has been inserted in the climbing shoe and the interior surface of the shoe dries out.

[0026] Using a composition comprising 65% v/v to 85% v/v of the alcohol, and 2% v/v to 25% v/v of the lubricant is further preferred to obtain an improved interaction of the composition with the footwear, and an improved balance between an optimal lubrication of the climbing shoe while the inner surface of the climbing shoe is wet upon application of the composition and the quick recovery of the grip as soon as the inside of the climbing shoe dries out.

[0027] Preferably, said composition comprises 10% v/v of said lubricant.

[0028] Using 10% v/v of the lubricant is further advantageous to obtain an optimal lubrication of the shoe while the composition is wet and recover sufficient grip once the inside of the climbing shoe dries out.

[0029] More preferably, said composition comprises 75% v/v of said alcohol and 10% v/v of said lubricant.

[0030] Using 75% of the C1-C4 alcohol and 10% v/v of the lubricant is further preferred to obtain an optimal interaction of the composition with the footwear and an optimal balance between lubrication while the inner surface of the climbing shoe is wet upon application of the composition and the recovery of the grip as soon as the inside of the climbing shoe dries out.

[0031] Preferably, said lubricant comprises a mixture

of saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral in the interval between 15 and 30. More preferably, said lubricant is a mixture of saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral in the interval between 15 and 30.

[0032] In the context of the invention, "a mixture of saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral number in the interval between 15 and 30" is to be understood as a mixture of hydrocarbon compounds with the general formula C_nH_{2n+2} with variable length of the hydrocarbon chain wherein the proportions of compounds with different n values can vary. It is possible that said mixture also contains a residual amount of hydrocarbon compounds with alternative formulas ($n < 15$ or $n > 30$). Small variations in the composition of this mixture due to residual amounts of other compounds are to be considered within the scope of the invention as long as they contain mainly saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral number in the interval between 15 and 30.

[0033] "A residual amount" is to be understood as the amount remaining after the refining or purification of said mixture of saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral number in the interval between 15 and 30 from a more complex mixture of hydrocarbon compounds obtained from a natural source or from a synthetic process. Methods of refining or purification of saturated hydrocarbon compounds C_nH_{2n+2} with specific n values or of saturated hydrocarbon compounds C_nH_{2n+2} with n values within a particular range are known by the skilled person in the art.

[0034] Preferably, said lubricant comprises a distilled petroleum derived paraffinic fraction obtained by a solvent extraction process. More preferably, said lubricant is a distilled petroleum derived paraffinic fraction obtained by a solvent extraction process.

[0035] In a preferred embodiment, the lubricant comprises a distilled petroleum derived paraffinic fraction obtained by a solvent extraction process, also known as petrolatum. Methods of solvent extraction allowing the obtention of said paraffinic fractions derived from petroleum by distillation are known by the skilled person in the art. It must be noted that the composition of said distilled petroleum derived paraffinic fractions may vary depending on the petroleum batch used as raw material. As long as the distilled petroleum derived paraffinic fractions mainly contain saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral in the interval between 15 and 30, small variations in their composition due to residual amounts of other compounds are to be considered within the scope of the invention.

[0036] Preferably, said lubricant comprises a vaseline. More preferably, said lubricant is a vaseline.

[0037] In the context of the invention the term "vaseline" is to be understood as a particular type of distilled petroleum derived paraffinic fraction, also known as pe-

troleum jelly or white petrolatum. This vaseline, petroleum jelly or white petrolatum is a purified mixture of semi-solid hydrocarbon compounds obtained from petrolatum with carbon numbers mainly higher than 25. It must be noted that the composition of said vaselines may vary depending on the petroleum batch used as raw material, and small variations in their composition are to be considered within the scope of the invention. Methods of refining or purification of vaselines are known by the skilled person in the art.

[0038] It is advantageous to use a vaseline as a lubricant due to its physicochemical properties: it is a light lubricant, with a high chemical stability and neutral with the shoe and the skin. These properties make it a preferred lubricant to carry out the invention as they allow to obtain optimal lubrication, maximize shoe care, and obtain an improved overall user experience.

[0039] Preferably, said lubricant comprises a polysiloxane of general formula $(-R_2Si-O)_m$, wherein R is an organic group and m is an integral. More preferably, said lubricant is a polysiloxane of general formula $(-R_2Si-O)_m$, wherein R is an organic group and m is an integral.

[0040] Polysiloxanes, also known as silicones, are polymers of general formula $(-R_2Si-O)_m$ wherein R is an organic group and m is an integral that varies depending on the size of the polymer. They are typically colorless oils or rubber-like substances, typically in the form of silicone oil or silicone grease, to cite some not limiting examples, and have lubricating properties.

[0041] In a preferred embodiment of the invention said lubricant comprises polydimethylsiloxane. In a more preferred embodiment of the invention said lubricant is polydimethylsiloxane.

[0042] The general formula of polydimethylsiloxane is $(-R_2Si-O)_m$ wherein the R is a methyl group and m is an integral. m can vary depending on the length of the polymer.

[0043] Preferably, said C1-C4 alcohol is selected among the group consisting of 2-propanol, 1-propanol and ethanol. More preferably, said C1-C4 alcohol is 2-propanol.

[0044] Preferably, the composition comprises 2% v/v to 7% v/v of H_2O , and more preferably it comprises 3.5% v/v to 5.5% v/v of H_2O .

[0045] In a preferred embodiment of the invention, the composition of the invention is an emulsion.

[0046] Providing a composition in the form of an emulsion, wherein the lubricant forms droplets or semi-solid particles that can be homogeneously dispersed in the liquid alcohol / water (if any), is advantageous as this allows a thin layer of the composition covering the inner surface of a climbing shoe to be formed upon application. This thin layer of the composition according to the invention, while wet, lubricates the inside of the shoe allowing the user to smoothly introduce the foot in the climbing shoe and place the toes in the correct position within the climbing shoe. Providing a composition according to the invention in the form of an emulsion also allows for the

correct amount of lubricant to be applied on the shoe so that when the alcohol / water (if any) phase evaporates, usually after short period of time after the application of the composition on the shoe, the inner surface of the shoe dries out and recovers its grip, thus ensuring the climbing shoe remains on the foot during use.

[0047] The composition of the invention can also be presented as a biphasic system wherein the lubricant phase and the alcohol / water (if any) phase are separated. Before use, the composition should be mixed to obtain an emulsion or dispersion.

[0048] Preferably, said composition comprises an odorant.

[0049] The addition of an odorant or a perfume compound to the composition according to the invention is advantageous to provide a pleasant smell and improve the user experience. In a preferred embodiment of the invention, the odorant is talcum perfume.

[0050] It is another object of the invention to provide a use of a composition according to the invention for lubricating climbing shoes.

[0051] The use of a composition according to the invention is advantageous to lubricate climbing shoes as it allows, upon application in the inner surface of a climbing shoe, to form a thin layer that, while wet, lubricates the inside of the shoe allowing the user to smoothly introduce the foot in the climbing shoe and place the toes in the correct position within the climbing shoe, and once dry, allows the climbing shoe to recover the grip of its inner surface ensuring the foot does not slip out and the shoe remains on the foot during use.

[0052] It is another object of the invention to provide a method for lubricating a climbing shoe characterized in that it comprises the steps of:

- i) providing a spraying device containing a composition according to the invention; preferably
- ii) shaking said spraying device to emulsify said composition; and
- iii) spraying said composition on the inside of a climbing shoe.

[0053] The method for lubricating a climbing shoe according to the invention is a simple and efficient method of applying the composition according to the invention to a climbing shoe. The method according to the invention allows to apply a thin layer of the composition according to the invention on the inner surface of a climbing shoe, temporarily wetting said inner surface such that it is easier for the user to introduce a foot in the climbing shoe. Once the foot is placed in the climbing shoe and the applied composition has not yet dried, it is possible to properly place the toe inside the shoe, despite the shoe being very tight on the foot. Once the inner surface of the climbing shoe dries out, namely due to the evaporation of the alcohol / water (if any) fractions, the inner surface of the climbing shoe recovers its grip and securely holds the foot inside the climbing shoe. If the composition of the

invention is presented as a biphasic composition wherein the lubricant phase and the alcohol / water (if any) phase are separated the composition should be mixed to obtain an emulsion or dispersion before use.

[0054] It is another object of the present invention to provide a spraying device containing a composition according to the invention.

[0055] Likewise, the invention also includes other features of detail illustrated in the detailed description of several embodiments of the invention.

Detailed description of embodiments of the invention

Example 1 - Obtention of a composition according to the invention (100 L batch)

[0056]

1. Add 75 L of isopropyl alcohol (IPA - CAS 67-63-0) to an empty reactor.
2. Add 0.5 L of Talcum perfume 3440 and dissolve it in the IPA.
3. Homogenise using a pneumatic mixer at 300 rpm.
4. Add the 10 L of vaseline oil (CAS 64741-89-5).
5. Keep mixing and do not stop the agitation.
6. Top up with decalcified water (14.5 L) up to a 100 L total volume.
7. Maintain mixing until a homogenous emulsion is obtained.
8. Bottle the finished product and label.

Example 2 - Obtention of a composition according to the invention (100 L batch)

[0057]

1. Add 75 L of isopropyl alcohol (IPA - CAS 67-63-0) to an empty reactor.
2. Add 0.5 L of Talcum perfume 3440 and dissolve it in the IPA.
3. Homogenise using a pneumatic mixer at 300 rpm.
4. Add the 6 L of vaseline oil (CAS 64741-89-5).
5. Keep mixing and do not stop the agitation.
6. Top up with decalcified water (18.5 L) up to a 100 L total volume.
7. Maintain mixing until a homogenous emulsion is obtained.
8. Bottle the finished product and label.

Example 3 - Obtention of a composition according to the invention (100 L batch)

[0058]

1. Add 75 L of isopropyl alcohol (IPA - CAS 67-63-0) to an empty reactor.
2. Add 0.5 L of Talcum perfume 3440 and dissolve it in the IPA.

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3. Homogenise using a pneumatic mixer at 300 rpm.
4. Add the 4 L of vaseline oil (CAS 64741-89-5).
5. Keep mixing and do not stop the agitation.
6. Top up with decalcified water (20.5 L) up to a 100 L total volume.
7. Maintain mixing until a homogenous emulsion is obtained.
8. Bottle the finished product and label.

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Example 4 - Obtention of a composition according to the invention (100 L batch)

[0059]

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1. Add 75 L of isopropyl alcohol (IPA - CAS 67-63-0) to an empty reactor.
2. Add 0.5 L of Talcum perfume 3440 and dissolve it in the IPA.
3. Homogenise using a pneumatic mixer at 300 rpm.
4. Add the 20 L of vaseline oil (CAS 64741-89-5).
5. Keep mixing and do not stop the agitation.
6. Top up with decalcified water (4.5 L) up to a 100 L total volume.
7. Maintain mixing until a homogenous emulsion is obtained.
8. Bottle the finished product and label.

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Claims

1. Composition **characterized in that** it comprises

35% v/v to 85% v/v of a C1-C4 alcohol;
2% v/v to 60% v/v of a lubricant;
H₂O; and preferably excipients.

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2. Composition according to claim 1 **characterized in that** it comprises

55% v/v to 85% v/v of said alcohol; and
2% v/v to 40% v/v of said lubricant.

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3. Composition according to claim 1 or 2 **characterized in that** it comprises

65% v/v to 85% v/v of said alcohol; and
2% v/v to 25% v/v of said lubricant.

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4. Composition according to claim 1 to 3 **characterized in that** it comprises

65% v/v to 85% v/v of said C1-C4 alcohol;
2% v/v to 15% v/v of said lubricant.

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5. Composition according to claim 1 to 4 **characterized in that** it comprises

70% v/v to 80% v/v of said alcohol; and

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4% v/v to 10% v/v of said lubricant.

6. Composition according to any one of claims 1 to 5 **characterized in that** said lubricant comprises a mixture of saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral in the interval between 15 and 30, and preferably said lubricant is a mixture of saturated hydrocarbon compounds with the general formula C_nH_{2n+2} wherein n is an integral in the interval between 15 and 30. 5
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7. Composition according to any one of claims 1 to 6 **characterized in that** said lubricant comprises a distilled petroleum derived paraffinic fraction obtained by a solvent extraction process, and preferably said lubricant is a distilled petroleum derived paraffinic fraction obtained by a solvent extraction process. 15
8. Composition according to any one of claims 1 to 7 **characterized in that** said lubricant comprises a vaseline, and preferably said lubricant is a vaseline. 20
9. Composition according to any one of claims 1 to 5 **characterized in that** said lubricant comprises a polysiloxane of general formula $(-R_2Si-O)_m$ wherein R is an organic group and m is an integral, and preferably said lubricant is a polysiloxane of general formula $(-R_2Si-O)_m$ wherein R is an organic group and m is an integral. 25
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10. Composition according to any one of claims 1 to 9 **characterized in that** said C1-C4 alcohol is selected among the group consisting of 2-propanol, 1-propanol and ethanol, and preferably the C1-C4 alcohol is 2-propanol. 35
11. Composition according to any one of claims 1 to 10 **characterized in that** said composition is an emulsion. 40
12. Composition according to any one of claims 1 to 11 **characterized in that** it comprises an odorant.
13. Use of a composition according to any one of claims 1 to 12 for lubricating a climbing shoe. 45
14. Method for lubricating a climbing shoe **characterized in that** it comprises the steps of:
 - i) providing a spraying device containing a composition as defined in any one of the claims 1 to 12; preferably
 - ii) shaking said spraying device to emulsify said composition; and 55
 - iii) spraying said composition on the inside of a climbing shoe.

15. Spraying device containing a composition as defined in any one of claims 1 to 12.



EUROPEAN SEARCH REPORT

Application Number

EP 22 38 3148

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The present search report has been drawn up for all claims			

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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

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