(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 238 790 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.11.2017 Bulletin 2017/44

(51) Int Cl.:
A63C 1/30 *(2006.01)* ***A63C 1/32*** *(2006.01)*

(21) Application number: **16167698.6**

(22) Date of filing: **29.04.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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(54) **SKATE**

(57) A skate comprises a boot (1), a blade holder (2) secured to said boot (1), and a blade (3) received in said blade holder (2). The skate forms, in a neutral position of a skater standing perpendicular to the ice surface, an angle (α) between a central axis of the blade (3) and the ice surface. The skate is formed such that said angle (α) deviates from a perpendicular angle such that the blade (3) inclines inwards.

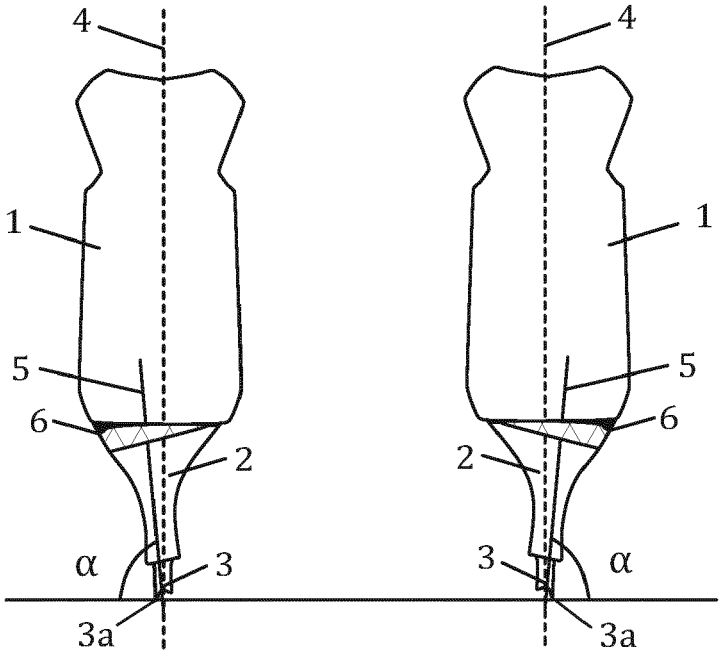

Fig. 2

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Description

BACKGROUND OF THE INVENTION

[0001] For a skater, the right angle between a skate blade and an ice surface is important to create the maximum speed. To be able to skate forward, the skater needs to push one leg to a side with one blade while gliding forward on the other blade. At the end of each push the skater has glided forward and the pushed leg is straight and fallen behind the skater. From that position the skater needs to pull the leg back under him to be able to set the blade on the ice to glide and push with the other leg.

[0002] The maximum speed of the skater depends on the power of the push, the speed of the pull and the glide. The faster the skater is capable of pushing his leg straight during the push phase, the faster the skater will move forward. However, to be able to push forward, the skater needs to push the blade to the side and not back while the blade points as straight forward as possible. The further away the skater pushes the blade from his centerline the less weight the skater can put on the blade and the risk to lose the grip on the ice increases. Most skaters tend to leave the push short due to the decreasing pressure between the foot and the sole of the skate decreasing the speed.

[0003] A faster pull allows the skater to perform more pushes and increasing the speed. The skater glides when the angle between the blade and the ice surface is about 90 degrees and the blade is straight on the ice. When the blade is straight on the ice, the ice melts creating a shallow layer of water between the blade and the ice. The water layer decreases the friction between the blade and the ice allowing the skater to maintain speed at almost no effort. In the long term, gliding also effects on the skating efficiency. To be able to glide the skater needs to pull the blade directly under the skater and lower it on the ice in a 90 degree angle so that the blade is straight on the ice. However, most skaters tend to leave the pull short and lower first the inner edge of the blade on to the ice. In this position the edge of the blade pushes the water away under the blade increasing the friction and decreasing the gliding speed.

[0004] Publications US 7562881, US 20140298600, US 4520580 and US 7523947 disclose prior art hockey skates or insoles for adjusting the position of a blade holder of the skate or a foot of a skater. In the above mentioned publications it is important that a blade of the skate is perpendicular to the ice surface when the skater is in a neutral position. The neutral position of the foot is achieved by adjusting the position of the foot or the blade holder. However, in the situations where the skater leaves the pull short and lowers first the inner edge of the blade on to the ice, the blade is not perpendicular to the ice surface degreasing the push power and the gliding speed.

BRIEF DESCRIPTION OF THE INVENTION

[0005] An object of the present invention is to provide a solution to solve the above problems. The objects of the invention are achieved by an arrangement which is characterized by what is stated in the independent claim. Embodiments of the invention are disclosed in the dependent claims.

[0006] The invention is based on the idea of a skate comprising a boot, a blade holder secured to the boot and a blade received in said blade holder. The skate forms, in a neutral position of a skater standing perpendicularly to the ice surface, an angle between a central axis of the blade and the ice surface. The skate is formed such that said angle deviates from a perpendicular angle such that the blade inclines inwards.

[0007] An advantage of the arrangement of the invention is to increase the push power and length of the glide. According to the invention the blade is not perpendicular to the ice surface when the person is standing in a neutral position contrary to all commercial skate models sold today where the skate blade is perpendicular to the ice surface in a neutral position of the skater. As a result, in the situations where the skater leaves the pull short and lowers first the inner edge of the blade on to the ice, the leg is inclined inwards making the glide shorter. However, when using the inwards inclined blade according to the invention the inclination angle of the blade will turn the blade perpendicular to the ice surface. This has the effect that the glide is longer and also in the pushing phase it is possible to push longer and harder without losing the grip on the ice.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] In the following the invention will be described in greater detail by means of preferred embodiments with reference to the attached drawings, in which

Figure 1 shows a skate to which embodiments of the invention may be applied;
Figure 2 shows a pair of skates seen from the back according to an embodiment of the invention;
Figure 3 shows a pair of skates seen from the back according to an embodiment of the invention;
Figure 4 shows a fastening arrangement of a blade to a blade holder according to an embodiment of the invention;
Figure 5 shows another fastening arrangement of a blade to a blade holder according to an embodiment of the invention;
Figure 6 shows a pair of skates seen from the back according to an embodiment of the invention; and
Figure 7 shows a pair of skates seen from the back according to an embodiment of the invention; and
Figure 8 shows a left skate seen from the back according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Figure 1 shows a skate, which may be a hockey skate, a speedskating skate, a figure skate or inline skate. The skate comprises a boot 1, a blade holder 2 secured to said boot 1, and a blade 3 received in said blade holder 2. The blade holder 2 may comprise a front bearer 7 secured under the toe of the boot and a rear bearer 8 secured under the heel of the boot. The front bearer 7 and the rear bearer 8 may be joined by a joint part 9. The blade holder 2 may be secured to the sole of the boot 2 with any suitable fasteners like rivets. The blade 3 may be secured to the blade holder by any convenient securement arrangement.

[0010] Figure 2 shows hockey skates seen from the back. The right skate is shown on the right-hand side and the left skate on the left-hand side of the Figure. The hockey skate may be arranged to form, in a neutral position of a skater standing perpendicularly to the ice surface, an angle α between a central axis 5 of the blade 3 and the ice surface. In the Figure 2 the angle α is on the left seen from the left skate blade 3 and on the right seen from the right skate blade 3. Thus, when the skater is standing the angle α is formed between the central axis 5 of the blade 3 outer surface and the ice surface. The angle α deviates from a perpendicular angle such that the blade 3 inclines inwards. The inclination angle α may be adjustable and there may also be some personal preferences about the suitable angle α. In an embodiment the angle α is 75°-85°. To find the suitable angle α several iteration rounds may be necessary. With the normal position is meant a position where a foot of the skater is located into the boot 1 so that a central axis 4 of the boot 1 is substantially perpendicular to the ice surface seen from the back. In the neutral position it is assumed that the foot of the skater has no position problems like pronation and/or supination or those problems have been corrected by using an insole or other solutions.

[0011] Figure 2 shows an embodiment wherein at least part of the blade holder 2 is formed such that the blade 3 inclines inwards. When the blade 3 inclines inwards only the outer edge 3a contacts the ice surface. The blade holder 2 may comprise an inclination part 6 forming the angle α. The blade holder 2 comprising the inclination part 6 may form a uniform structure. The central axis 5 of the blade 3 and the blade holder 2 has the same inclination angle α to the ice surface which deviates from the angle of the central axis 4 of the boot 1. As can be seen from Figure 2 only part of the blade 3 surface contacts the ice surface because of the formed inclination angle α.

[0012] Figure 3 discloses a skates according to an embodiment where at least part of a blade 3 is formed such that the blade 3 inclines inwards. The blade 3 comprises an inclination part 6 forming an angle α. The blade 3 comprising the inclination part 6 may form a uniform structure. Figure 4 shows the blade 3 and a blade holder 2 from Figure 3. The blade 3 of the left skate comprises an outer edge 3a of the blade 3 which contacts the ice surface and an inner edge 3b of the blade which is, due to the inclination angle α, in the air above the ice surface. A central axis 5 of the blade 3 has a different inclination angle α to the ice surface than a central axis 4 of the blade holder 2 and the boot 1. In this solution the boot 1 and the blade holder 2 have the same inclination angle α. The blade 3 has been fixed into the blade holder 3 by securing part of the blade inside the blade holder by any suitable means.

[0013] Figure 5 describes an embodiment where a blade 3 may comprise a fixing part 9 arranged to have substantially the same inclination angle to the ice surface than a central axis 4 of the blade holder 2, an inclination part 6 and a blade part 10 arranged to have a different inclination angle to the ice surface than said fixing part 9. The blade holder 2 and the fixing part 9 of the left foot share the same central axis 4 which deviates from a central axis 5 of the blade part 10. The fixing part 9, the inclination part 6 and the blade part 10 may be arranged to form a unitary structure. The blade 3 has been fixed into the blade holder 3 by securing the fixing part 9 inside the blade holder by any suitable means.

[0014] In Figure 6 a skate comprises at least one plate part 11, which is releasable arranged between the boot 1 and the blade holder 2 to incline the blade 3 inwards. The plate part 11 may be releasable arranged between the boot 1 and the blade holder 2 by releasing at least one of the fasteners used to secure the blade holder 2 to the boot 1. At least one plate part 11 may be arranged and secured between a bearer 7 and/or a rear bearer 8 of the blade holder and a boot 1. The central axis 5 of the blade 3 and the blade holder 2 has the same inclination angle α to the ice surface which deviates from the central axis 4 of the boot 1. Depending upon the amount of correction a different amount, size or shape of plate parts 11 may be used to select an appropriate angle α. In an embodiment at least one plate part 11 may be wedged-shaped.

[0015] Figure 7 describes an embodiment wherein at least part of the boot 1 is formed such that the blade 1 inclines inwards. This may be done so that the boot 1 may comprise an inclination part 6 forming an angle α. The inclination part 6 may be formed into the bottom of the boot 1 so that the boot 1 and the inclination part 6 form a unitary structure. In this embodiment a central axis of the boot 1 and a central axis 5 of the blade holder 2 and the blade 3 have a different inclination angle α to the ice surface. The boot 1 may be formed from one or more parts. In an embodiment the boot 1 may comprise a separate plastic plate arranged between the boot 1 and the blade holder 2 to incline the blade 3 inwards. The plastic part may have a shape of an insole. In an embodiment the boot 1 and the plastic part may form a unitary structure.

[0016] When the skate is arranged to form, in a neutral position of a skater standing perpendicularly to the ice surface, an angle α between a central axis of the blade 5 and the ice surface, which angle α deviates from a

perpendicular angle such that the blade 3 inclines inwards and only the outer edge 3a of the blade 3 contacts the ice surface when a skater stands in a neutral position perpendicularly to the ice surface. This has the effect that when the skater has a habit to pull the skate back after the push so that the blade is lowered onto the ice surface with the inner edge 3b of the blade 3 first the invention alters the angle α between blade 3 and the ice surface closer to 90 degrees as can be seen from Figure 8 showing the left skate of the skater. As a result the blade 3 will be positioned perpendicularly to the ice surface so that the outer edge 3a and the inner edge 3b are on the ice surface. This increases the push power and the length of the glide.

[0017] To make a personalized skate users may select from the embodiments of the invention a particular skate boot and then match it with a desired blade holder and a blade part. It is also possible to form different combinations of a blade holder and a blade arranged in a unitary structure.

[0018] It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims.

Claims

1. A skate comprising a boot(1), a blade holder (2) secured to said boot (1), and a blade (3) received in said blade holder (2), wherein the skate is arranged to form, in a neutral position of a skater standing perpendicularly to the ice surface, an angle (α) between a central axis (5) of the blade (3) and the ice surface, which angle (α) deviates from a perpendicular angle such that the blade (3) inclines inwards.

2. A skate according to claim 1, wherein at least part of the blade holder (2) is formed such that the blade (3) inclines inwards.

3. A skate according to claim 2, wherein the central axis (5) of the blade (3) and the blade holder (2) have the same inclination angle to the ice surface.

4. A skate according to claim 1, wherein at least part of the blade (3) is formed such that the blade (3) inclines inwards.

5. A skate according to claim 4, wherein the central axis (5) of the blade (3) has a different inclination angle to the ice surface than a central axis (4) of the blade holder (2) and the boot (1).

6. A skate according to claim 4, wherein the blade (3) comprises a fixing part (9) arranged to have substantially the same inclination angle to the ice surface than the central axis (4) of the blade holder, an inclination part (6) and a blade part (10) arranged to have a different inclination angle to the ice surface than said fixing part (9).

7. A skate according to claim 6, wherein the fixing part (9), the inclination part (6) and the blade part (10) are arranged to form a unitary structure.

8. A skate according to claim 1, wherein the skate further comprises at least one plate part (11), which is releasable arranged between the boot (1) and the blade holder (2) to incline the blade (3) inwards.

9. A skate according to claim 8, wherein at least one plate part (11) is wedged-shaped.

10. A skate according to claim 1, wherein at least part of the boot (1) is formed such that the blade (3) inclines inwards.

11. A skate according to claim 10, wherein a central axis (4) of the boot (1) have a different inclination angle to the ice surface than the central axis (5) of the blade holder (2) and the blade (3).

12. A skate according to claim 10 or 11, wherein the central axis (5) of the blade (3) and the blade holder (2) has the same inclination angle to the ice surface.

13. A skate according to any of the preceding claims, wherein the angle (α) between the central axis (5) of the blade (3) and the ice surface is 75°-85°.

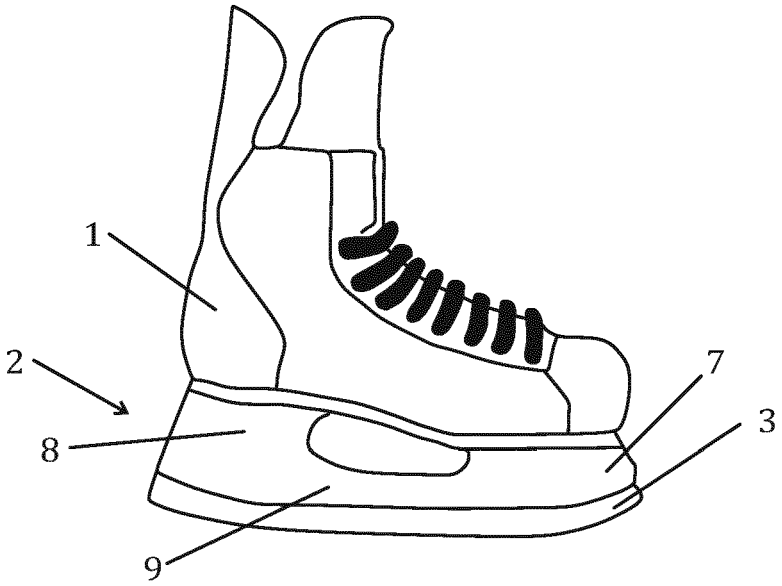

Fig. 1

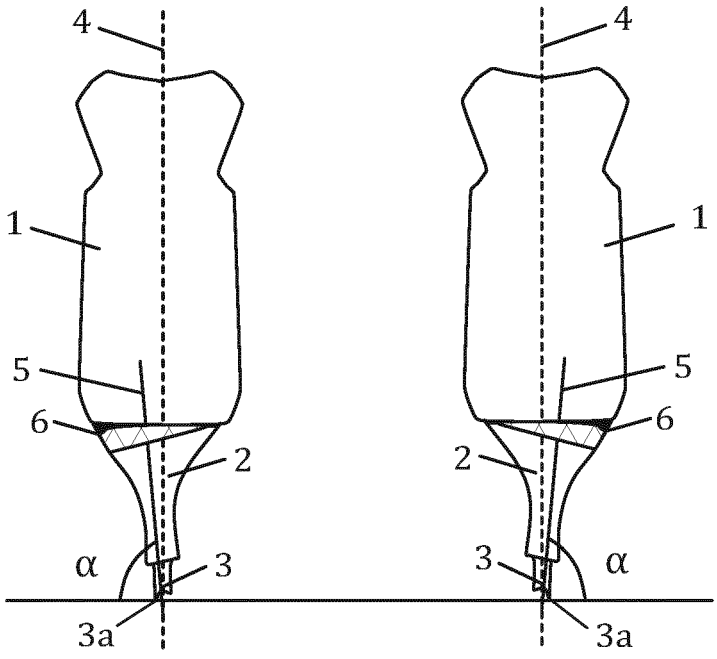

Fig. 2

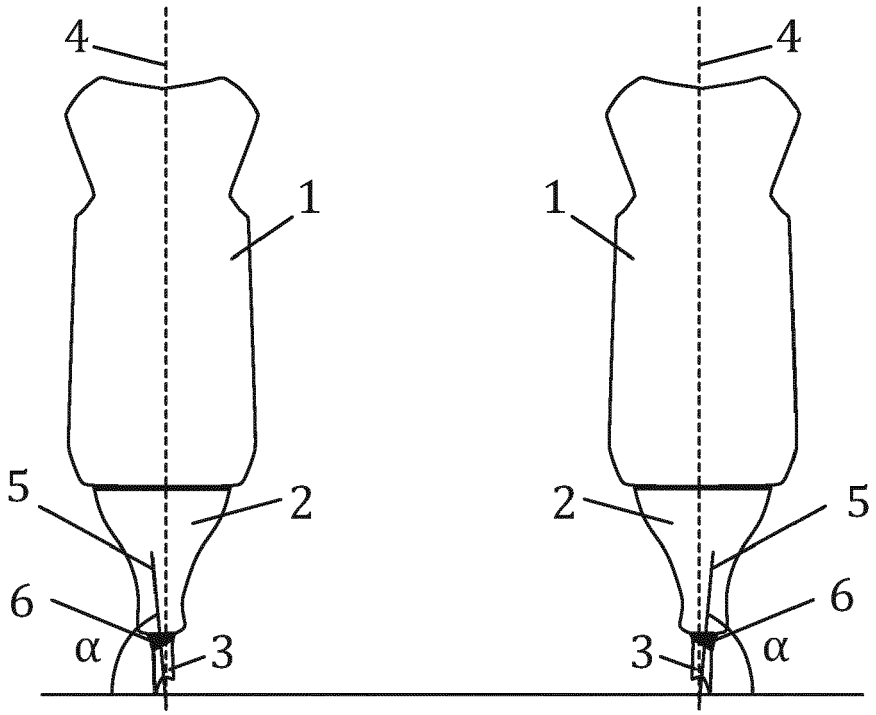

Fig. 3

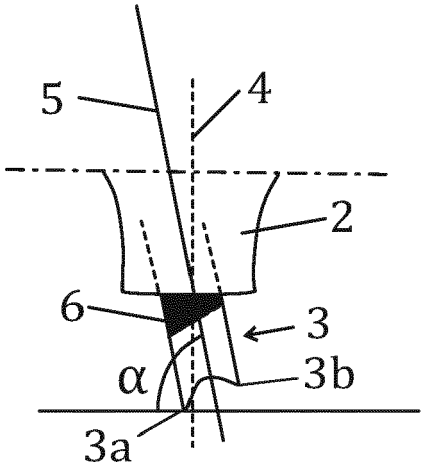

Fig. 4

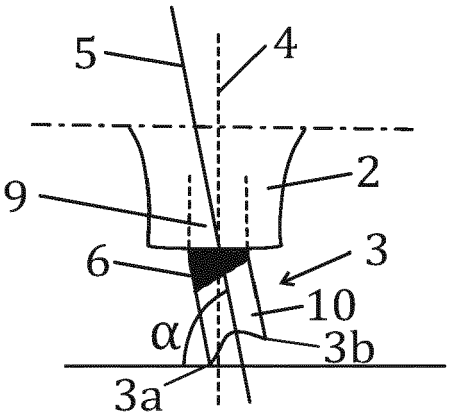

Fig. 5

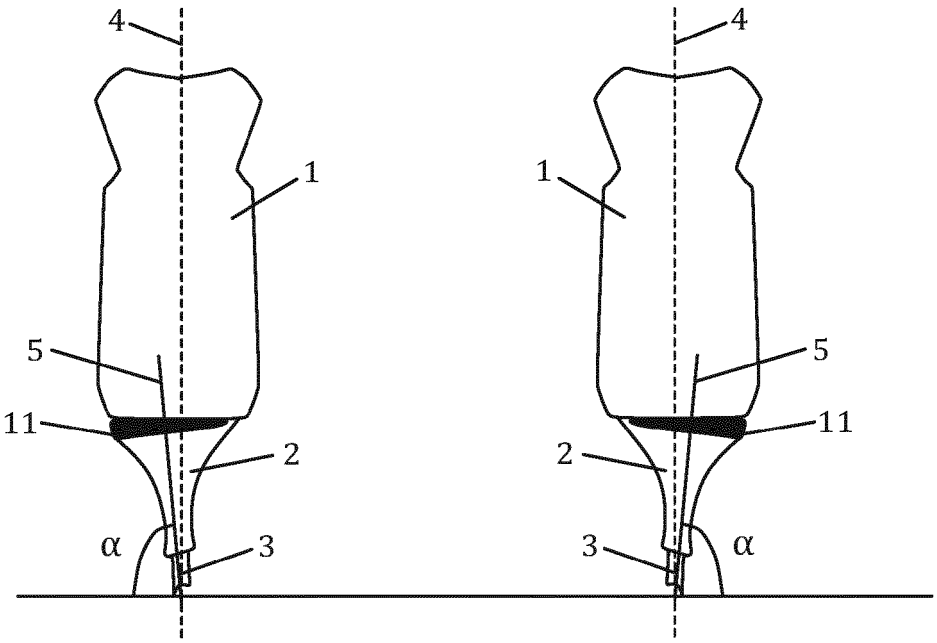

Fig. 6

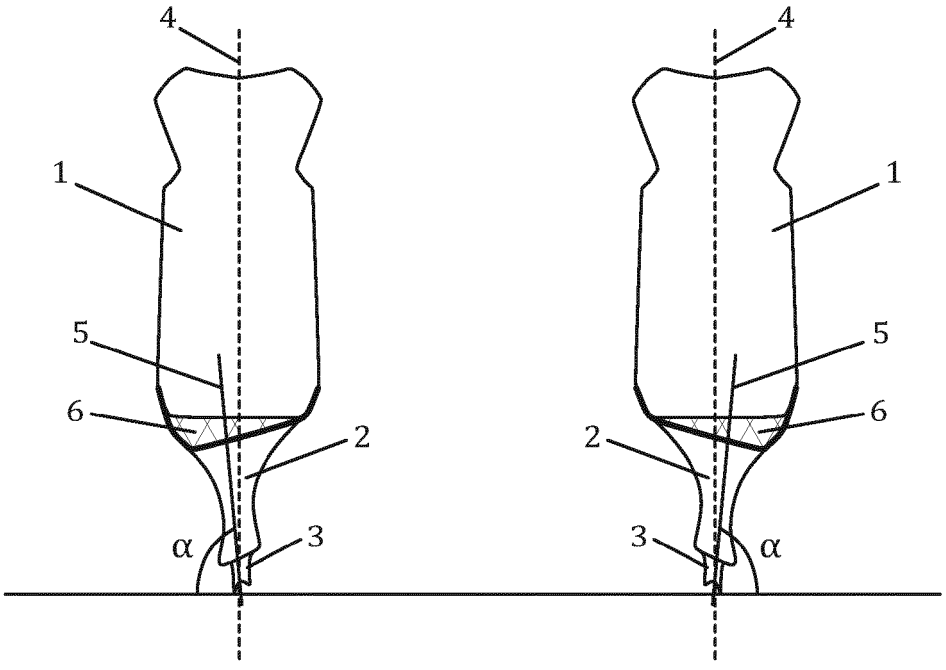

Fig. 7

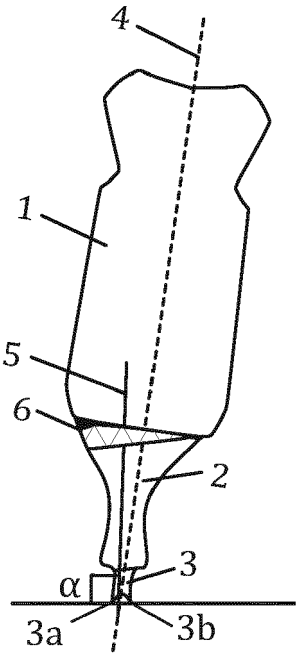

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 16 16 7698

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC) A63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 October 2016	Brunie, Franck

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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