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(54) Title: SKI WAX COMPOSITION

(57) **Abrégé/Abstract:**

The invention relates to a ski wax composition to be arranged on the base of a ski. According to the invention, the ski wax composition contains substantially two components, wherein component A contains an aqueous dispersion and plastic pellets and component C contains a fluorine-containing wax compound which is substantially water-repellent.



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SKI WAX COMPOSITION**FIELD OF THE INVENTION**

The invention relates to the ski wax
5 composition as defined in the preamble of claim 1 and
to the use of the wax composition as defined in the
preamble of claim 8.

In this context, the term skis refers to any
skis or equivalent sports or recreational equipment
10 used on snow and to different kinds of runners of
instruments or equipment that move on snow.

BACKGROUND OF THE INVENTION

Known from prior art are different kinds of
15 glide and grip waxes for waxing skis. Known are so-
called traditional glide and grip wax products which
are applied onto the base of a ski either over the
grip or the glide zones. Further known are different
kinds of glide wax strip products, grip tape products
20 and instant grip products.

The problem with the known grip waxes is that
the grip wax must be selected according to the
temperature. To avoid problems during skiing, the skis
must be grip-waxed specifically for each type of
25 weather conditions, normally even at intervals of four
degrees of temperature; soft for mild and hard for
cold weather. The known grip tapes function in a
broader temperature range.

The grip waxes and grip products are arranged
30 over a so-called grip zone of the ski on the centre
part of the base of the ski to provide the grip. The
problem with the grip products and grip waxes applied
onto the base of the ski has been the so-called
sticking of the ski and the lack of gliding properties
35 during skiing.

Also the known glide waxes are selected based on the temperature and weather conditions.

A further problem with the known waxes is their poor durability. Soft waxes in particular easily wear off from the base of the ski. Consequently, waxes that wear off from the base of the ski soil the trails during skiing, and, over the years, the wax residues accumulate in the ground over the same ski tracks.

10 **OBJECTIVE OF THE INVENTION**

The objective of the invention is to eliminate the drawbacks referred to above. A further objective of the invention is to disclose a new type of ski wax composition for simultaneous glide and grip waxing of the base of a ski. One specific objective of the invention is to disclose a new and improved ski wax composition with better properties than before. One further objective of the invention is to facilitate and speed up the act of bringing the ski into use without the separate grip and glide waxing, to reduce the effect of the temperature on the waxing and to prevent the wax from wearing off from the base of the ski.

25 **SUMMARY OF THE INVENTION**

The ski wax composition and the use thereof according to the invention are characterized by what has been presented in the claims.

The invention is based on a ski wax composition that can be arranged on the base of a ski. According to the invention, the ski wax composition contains substantially two components, wherein component A contains an aqueous dispersion and plastic pellets and component C contains a fluorine-containing wax compound which is substantially water repellent.

In one embodiment, the ski wax composition contains plastic pellets in varying sizes. In one embodiment, component A contains plastic pellets in the nano- and/or micro-scale. Component A may further
5 contain agglomerates of the pellets in the nano- and micro-scale.

In one embodiment of the invention, the diameter of the plastic pellets is substantially from 10 to 100nm.

10 Preferably, the plastic pellets are not hollow. Preferably, the ski wax composition contains plastic pellets in a predetermined amount depending on the intended use of the ski. In one embodiment, component A contains plastic pellets in an amount of 3
15 to 15%, preferably less than 10%.

In one embodiment of the invention, the ski wax composition contains component A in an amount of substantially more than 50% by weight, in one preferred embodiment from 50 to 90% by weight. In one embodiment,
20 the ski wax composition contains component A in an amount of 75 to 86% by weight.

In one embodiment of the invention, the aqueous dispersion contains urethane compound in an amount of 0 to 100% by weight and acrylate compound in
25 an amount of 0 to 100% by weight. Preferably, the aqueous dispersion operates as a binder.

In one embodiment of the invention, the ski wax composition contains component C in an amount of 10 to 30% by weight, in one embodiment from 14 to 25% by
30 weight.

In one embodiment, a same or substantially similar compound as is used e.g. as a textile coating, making the textiles -water-repellent, is used as component C.

35 In one embodiment, component C is a wax dispersion having the melting temperature below -20°C ,

boiling temperature at 104 to 106°C (973mbar),
flashpoint above 100°C as determined by DIN51758 and
vapour pressure at about 133mbar at 50°C. The density
of component C is about 1.6g/cm³ (20°C) as determined
5 by DIN 51757.

In one embodiment, the ski wax composition
may contain fillers or suitable additives in addition
to components A and C. Any agents known per se in the
art which are suitable for the intended use may be
10 used as the fillers and additives. In one embodiment,
isocyanate or a derivative thereof is used as an
additive.

In one embodiment of the invention, the ski
wax composition contains component A in an amount of 50
15 to 90% by weight, which contains urethane and acrylate
compounds in an amount of 30 to 60% by weight and
plastic pellets in an amount of less than 10%, and
component C in an amount of less than 25% by weight.

The composition, and in particular the ratio
20 of the different components, the size and amount of
the plastic pellets and the composition of the
different components in the ski wax according to the
invention are controlled and optimized based on the
intended use and the user group of the ski. In one
25 embodiment, the amount of the plastic pellets is
reduced in order to achieve better grip. Respectively,
when the amount of the pellets is raised above a
specific threshold, the grip is reduced.

Furthermore, the invention is based on the
30 use of some of the ski wax compositions described
above. According to the invention, the composition is
used as a wax coating, preferably as a permanent
coating, as part of the base coating of the ski and/or
as a ski wax arranged on the base of the ski.

35 The invention is based on the idea of
providing on the base of the ski a continuous coating

which simultaneously exhibits good glide and grip properties, and maintaining the glide and grip properties of the ski at all temperatures and in all weathers without the wax wearing off from the base of the ski.

The composition according to the invention preferably serves both glide and grip functions, specifically as a combination of components A and C.

Component A of the ski wax composition according to the invention provides heat production between the ski and the snow. The heat is controlled by the amount and the chemical composition of the plastic pellets.

Component C of the ski wax composition according to the invention changes the surface tension and surface energy in such manner that it assembles the water droplets in small groups, forming from the water droplets a bearing-like surface under the ski, on which surface the ski glides. As the pressure increases on the ski, the water droplets are broken, thereby providing a suction effect resulting in the grip of the ski. Correspondingly, as the pressure is released from the ski, the ski is lifted and starts to glide easily due to the reforming bearing-like surface.

In one embodiment, the ski wax composition is preferably in liquid, i.e. fluent, form. In another embodiment, the ski wax composition is in solid form, preferably in paste or wax form.

The ski wax composition may be arranged over a zone of a desired length and width on the base of the ski. The composition may be arranged over the entire area of the base of the ski. The layer thickness of the coating may be controlled steplessly. The ski wax composition also works with a thin layer thickness.

In one embodiment of the invention, the wax composition is arranged over the entire area of the base of the ski. In one embodiment, the wax composition is arranged on the base of the ski over a predetermined zone that is smaller than the entire base of the ski.

The ski wax composition can be arranged into a wax coating over a desired area already at the factory in connection with the production of the ski, or into part of the base material of the ski. Also, the wax coating can be easily formed on the base of the ski afterwards, e.g. in sports shops.

The invention provides the advantage of providing on the base of the ski a continuous wax layer / coating which functions simultaneously as a glide and a grip coating.

The ski wax composition according to the invention provides good glide and grip without negative implications on the other application properties of the ski. Skis that have been treated with the ski wax composition according to the invention do not stick at the onset of a glide, the grip being nevertheless good. Thanks to the composition according to the invention, the temperature does not affect the properties of the ski wax according to the invention. The coating according to the invention does not freeze in any weather, i.e. the base of the ski does not gather water from the snow crystals when it glides on the surface of the snow, and it also works in so-called problem weathers, such as when the temperature is close to zero.

The ski wax according to the invention is very durable. The ski wax holds for thousands of kilometres of trails and it does not wear to a considerable extent by abrasion or dissolve in water.

The advantage of the invention is that it provides a completely maintenance-free ski, and once the ski has been treated, it will always be ready for skiing in all weathers. The skis do not need to be
5 waxed at the onset of every skiing trip.

Other ski waxes known per se can be applied onto the ski wax coating according to the invention and be easily removed from the surface of the coating e.g. by the normal manner of cleansing and the use of a
10 cleansing agent. The wax coating according to the invention does not change in any way and the glide and grip properties are still maintained.

The invention is suitable for use in skis in any conditions and weathers and by any user group that
15 wishes to easily achieve good glide and grip properties for their skis.

DETAILED DESCRIPTION OF THE INVENTION

In the following section, the invention will
20 be described with the aid of a detailed example of an embodiment.

Example 1

In this example, the ski wax coating
25 according to the invention was formed on the base of a ski in a continuous manner over the entire area of the base. The glide and grip properties of the ski were examined in test skiing situations.

The ski wax composition contained
30 substantially two components, namely components A and C.

Component A contained nano-sized plastic pellets having the size mainly between 20 and 80nm depending on the intended use of the ski. An acrylate-
35 and urethane-based aqueous dispersion containing 5 to 10% plastic pellets was used as component A. The

amount of plastic pellets indicated above was found to be preferred based on the previous tests. The ski wax composition contained component A in an amount of 75 to 84% by weight.

5 Component C substantially contained water and a soil-repellent fluorine-containing wax compound having a melting point between 100 and 110°C. A compound which is used as a water-repellent coating in textiles, commercially available under trademark PLL,
10 which contained a solution of PFA-GTH-323, was used as the fluorine compound. The ski wax composition contained component C in an amount of 16 to 23% by weight, which had been found to be the preferred amount based on the previous tests.

15 In the tests, different ski wax compositions were produced within the limits indicated above, with varying the relative proportions and compositions of components A and C.

20 The ski wax ingredients were mixed into a liquid composition and applied onto the base of the ski over a desired zone, mainly over the entire area of the ski, in room temperature. The coating applied onto the base of the ski was let to dry, after which the ski was ready for use.

25 In the tests, skis waxed with different ski wax compositions were tested in different skiing situations.

30 As a result of the tests, it was surprisingly found that all skis waxed with the wax composition according to the invention worked very well in all weather ranges.

35 In the tests, it was observed that the combined effect of component A and component C provides very good ski-ability, i.e. glide and grip, to the ski. It was observed further that the wax coating according to the invention provides hold of

the water droplets under the ski, so that good glide and grip properties were achieved.

Further, it was observed in the tests that the best composition varied according to whether the user was a recreational or a racing skier. 5 Furthermore, it was observed in the tests that in some cases, in particular in the case of a racing skier and a more advanced active skier, the ratio and composition of the different components in the 10 composition can, if desired, be modified based on the weight range of the skier.

The ski wax composition according to the invention is suitable for use in different embodiments 15 on the base of any kinds of skis in any kinds of conditions.

The embodiments of the invention are not limited merely to the examples referred to above; instead many variations are possible within the scope 20 of the accompanying claims.

CLAIMS

1. A ski wax composition to be arranged on the base of a ski, characterized in that the ski wax composition contains substantially two components, wherein component A contains an aqueous dispersion and plastic pellets and component C contains a fluorine-containing wax compound which is substantially water-repellent.

2. The ski wax composition according to claim 1, characterized in that the diameter of the plastic pellets is substantially from 10 to 100nm.

3. The ski wax composition according to claim 1 or 2, characterized in that component A contains 3 to 15% plastic pellets.

4. The ski wax composition according to any one of claims 1 to 3, characterized in that the ski wax contains component A in an amount of 50 to 90% by weight.

5. The ski wax composition according to any one of claims 1 to 4, characterized in that the aqueous dispersion contains a urethane compound in an amount of 0 to 100% by weight and an acrylate compound in an amount of 0 to 100% by weight.

6. The ski wax composition according to any one of claims 1 to 5, characterized in that the ski wax contains component C in an amount of 10 to 30% by weight.

7. The ski wax composition according to any one of claims 1 to 6, characterized in that the ski wax contains component A in an amount of 50 to 90% by weight, which contains urethane and acrylate compounds in an amount of 30 to 60% by weight and plastic pellets in an amount of less than 10%, and component C in an amount of less than 25% by weight.

8. Use of the ski wax composition according to any one claims 1 to 7, characterized in

that the composition is used as a wax coating, as part of the base coating of a ski and/or as a ski wax arranged on the base of a ski.

9. The use according to claim 8, characterized in that the wax composition is arranged over the entire area of the base of the ski.

10. The use according to claim 8, characterized in that the wax composition is arranged on the base of the ski over a predetermined zone which is smaller than the entire base of the ski.