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

(11) EP 2 727 636 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.05.2014 Bulletin 2014/19

(51) Int Cl.:
A63C 11/02 *(2006.01)* ***A63C 11/04*** *(2006.01)*

(21) Application number: **13005026.3**

(22) Date of filing: **21.10.2013**

(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

(30) Priority: **02.11.2012 IT TV20120207**

(71) Applicant: **Trevisiol, Ezio**
31100 Treviso (IT)

(72) Inventor: **Trevisiol, Ezio**
31100 Treviso (IT)

(54) Dynamic protector for ski bindings attached to the ski

(57) The present invention concerns a bridge for ski set-up with a functional dynamic behaviour.

This instrument serves the purpose of moving skis (9) with their bindings (8) through the machinery equipped with a dragger (6) used for its processing.

The two functions of the bridge are: allowing the dragger (6) to override the bindings (8) of the ski (9), and transfering the pressure of the dragger (6) to the ski surface (9), needed for the workings effected by the tools (7).

The innovative elements of the dynamic bridge are its flexing supporting structure (1) and its wedges (2, 3, 4) that together form a dynamic set able to effect a direct and uniform transmission of the pressures from the dragger (6) to the ski (9), area to area, avoiding any need of special adjustment of its parts.

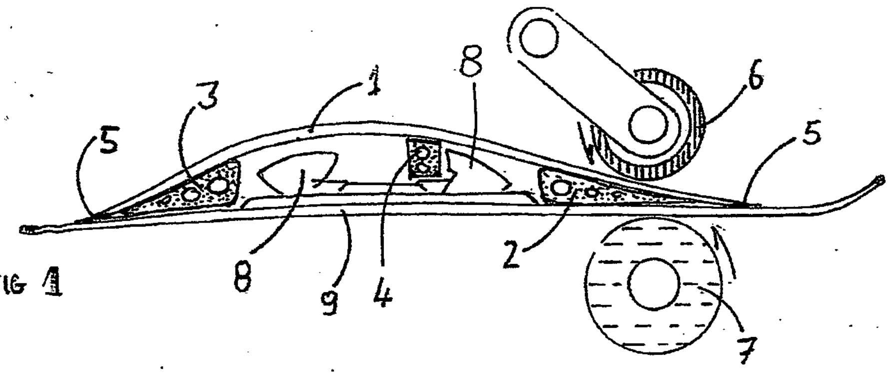

FIG 1

EP 2 727 636 A1

Description

[0001] The present innovation (invention) concerns an instrument defined bridge for ski set-up, essential to move the ski with its bindings through the machinery used for its processing.

[0002] Current condition of the processing technique: to process and recondition skis we use machinery for splattening, imprinting, polishing, foils (lamina) sharpening etc. This machinery is often equipped with a dragger (6), that is a rubber-coated wheel that applies a pressure on the ski (9) and makes it run over its processing devices (7), which can be abrasive grinders, stones, hollow cutters etc

[0003] The two functions of the bridge are: allow the dragger (6) to override the bindings of the ski (8), if they are with it; and to transfer the pressure of the dragger (6) to the ski surface (9).

[0004] Up to now, the bridges have been are manufactured with materials such as plastics, metals, wood, aiming to get the minimum of warping, without worrying about the weight of the end product.

[0005] Both the heavy weight and expecially the stiffness of the structure are the limits to overcome. The current bridges lay and press on the surface of the ski in small contact points set at their ends. In these points centers the push of the dragger that, in its turn, is distributed on the ski provoking its stiffening. This arrangement generates an irregular and fluctuating pressure on the contact area between the ski and the processing devices that is affected by many variables among which the inclination of the bridge ramps, the warping of the structure of the ski, the leverage points made by supporting rollers on the machinery, if any, etc..

[0006] Some bridges can be equipped with a connecting and supporting system set at the binding of the ski, which in itself can represent another variable.

[0007] Skis of today are very different from those of the past: they are shorter, thinner, consisting of structures made with cutting-edge materials and techniques.

[0008] Today, it has been shown by ever more sophisticated ski processing, together with their new structures, the failing of the bridges as described above. In fact, they can manufacture irregular jobs caused by an uneven and wavering pressure on the ski.

[0009] Moreover, the high weight of the traditional bridges, added to the weight of the ski with bindings and plates, makes tiring and uneasy the use of these instruments. Solution: create a dynamic flexing bridge (fig.2), extremely lightweight, with manufacturing features that allow it to transfer on the ski (9) the pressure provided by the dragger (6) in the most focused and steady way, in each area. To achieve this goal the concept of a stiff bridge has been completely abandoned.

[0010] The supporting structure (1) of the dynamic bridge has been manufactured with composite materials such as carbon fibre, glass, kevlar, resins and other light structural materials, combined together using the most innovative techniques borrowed from the aero-space industry. Given that the innovation resides on the flexing dynamic outcome of the whole set, it is possible to think that the dynamic bridge can be manufactured with materials different from those mentioned above. The profile of the supporting structure (1) of the new dynamic bridge is of an arching and curvy design to allow the smoothest of flowing to the dragger (6) on its surface. The thickness, and the resulting opposition to the flexing of the supporting structure (1), tapers increasingly to the ends. This structure allows a different elastic flexing between the ends and the central area, with a behaviour similar to a bow shock. Thus, when the dragger (6) works on the surface of the dynamic bridge (1), it effects a different warping near the ends than in the central area. The dimensions, for guidance, could be: lenght 130 cm, width 8 cm, depth 1 cm. Nonetheless it is possible to consider different sizes depending on the kind of ski we intend to work on (ski for adults, for children, snow board, etc..).

[0011] Another functional element of the innovative bridge for ski are the wedges 2 3 4. They are big wedges made of an expanded plastic material, light and elastic, attached to the underside of the supporting structure (1) of the dynamic bridge in the area between its ends and the area taken by the bindings (8) of the ski.

[0012] They give stability and balance to the dynamic bridge (1) because of their wide contact surface when they rest on the ski (9) and then, connecting the underside of the bridge (1) directly with the upperside of the ski (9), they transfer the push imparted by the dragger (6) directly to the surface of the ski (9), providing an original transmission of loads.

[0013] Without the wedges 2 3 4 or similar systems of transferring the loads of the dragger (6) to the ski (9), it would not be possible to create a supporting structure (1) of the bridge so light and dynamically flexing.

[0014] As already said, the wedges 2 3 4 are manufactured with a plastic material, elastic, rubbery and with a low specific weight. In this case, a product called e.v.a. has been used.

[0015] The wedges can be provided with holes or other workings that lower their weight or alter their resistance to compression. On the whole, they can have a width equivalent to that of the supporting structure (1).

[0016] They can be firmly secured to the under side of the bridge or by ways that can allow their removal or shifting.

[0017] The middle wedge (4) eases the placement of the dynamic bridge (1) onto the ski (9), and transmits the pressure of the dragger (6) in the area binding-underlay (8).

[0018] When the dragger (6) passes over the dynamic bridge (1) above the wedges (2) and (3), the structure of the bridge (1) thinner and flexible, warps without any particular resistance. The weight conveyed by the dragger (6) is cushioned almost in its entirety by the involved wedge (2) or (3), that transmits it directly to the ski (9) under it; only a residual part of the pressure will involve the other areas of the bridge.

[0019] When the dragger (6) then passes over the central areas of the bridge (1), it weighs on a thicker structure of the bridge that allows a shifting of pressures from the frontal wedge (2) to the central wedge (4), and at last to the posterior wedge (3).

[0020] During this passage, that sees the middle wedge (4) as the main agent of thrust, the two ends of the bridge (1) are nearly unburdened b any pressure.

[0021] These workings generate a transmission of weight from the dragger (6) to the ski (9) direct and limited, area to area, gradual, avoiding any dispersion of pressure or creation of unwanted tensions on the surfaces of the ski (9).

[0022] This allows manufacturing results comparable to those achievable working with the dragger (6) directly on the surface of skis without bindings and underlays (ideal working condition).

[0023] The first flexing warping of the structure (1) appears also with very light loads, below a kilo, and for this reason it is not necessary that the wedges 2 3 4 with an unloaded bridge stick perfectly to the ski (9); the contact will happen automatically and it will finish as soon as the dragger (6) will ascent the dynamic bridge (1).

[0024] At the same time, the dynamic bridge (1) supports without any problem the top operating pressures referred to the instruments for ski set-up.

[0025] The upperside of the dynamic bridges will rather be of a non slippery material and at its ends there will be rubber tips (5) with the aim of helping the smooth ascent and the descent of the dragger (6).

[0026] Many and substantial the benefits in comparison to the pre-existent technique. The weight of our dynamic bridge (1) is up to five times lower than a bridge of old craftmanship and easily under 1 kg; our prototype weighs 0.6 kg, and this effects a lesser strain on the operator and thus a better productivity.

[0027] The easy adaptation to particular morphologies of the ski upper part (9) thanks to the wide and conformable wedges 2 3 4, gives stability and adherence to the surface of the ski (9) and produces a great user friendliness.

[0028] But above all the innovative transmission of pressures from dragger (6) to ski (9), allowed by the special flexibility of the dynamic bridge (1), affords excellent set-ups of the skis of today.

[0029] In special models, the wedges 2 3 4 could be made with various joynted parts with the aim of achieving apt dimensional, structural, functional, or aesthetic alterations and, moreover, they could be removable and/or replaceable under the supporting structure (1), so giving further multifunctionality to the dynamic bridge. The supporting structure (1), with similar characteristics of dynamics and weight, could be achieved with numerous alternative design solutions, such as for instance different profile shapes, different section shapes.

[0030] It is not to be excluded that other materials different from those mentioned can produce similar performances. They would be only equivalent solutions because the core of this innovation consists in the dynamic-functional warping of the whole structural set 1 - wedges 2 3 4 that effects a new and more direct transmission of the pressures from the dragger (6) to the ski (9).

[0031] Figure (1) shows a side view of the dynamic bridge in a simulation of usage; elements are shown that help to understand its scope.

[0032] Let's point out the arched structure of supporting bridge (1). It rests on a ski (9) in a set with bindings (8). The front wedge (2) fills the space between the front binding and the front end of the bridge (1). The rear wedge (3) fills the space between rear binding e rear end of the bridge (1). The middle wedge (4), that has the job of supporting the tip binding (8), assists on the correct positioning of the bridge (1) on the ski (9) and transmit the pressure of the dragger (6) to the bindings area (8).

[0033] The dragger (6), thanks to its rotation, applies a precise pressure on the bridge (1) so moving the ski (9) on the tool (7) (abrasive grinder) that, with a contrary rotation to that of the dragger (6), carries out the work on the ski (9).

[0034] The rubber non-slip tips (5) have the function of easing the ascent and discent of the dragger (6) without any jolt.

[0035] In figure (2), side view of the dynamic bridge, we can notice:

the profile of the supporting structure (1), the front wedge (2), the middle wedge (4), the rear wedge (3), the two rubber tips (5).

[0036] In figure (3), view from above of the dynamic bridge, we can notice:

the upperside of the dynamic bridge with anti-slip (1), rubber tips (5).

[0037] In figure (4), view from below of the dynamic bridge, we can notice:

rubber tips (5), front wedge (2), middle wedge (4), rear wedge (3), structure end of the bridge (1).

Claims

1. Covering bridge for ski binding, made of an arching supporting structure (1) with a non-slip surface, and tips (5) set at the two ends; *it is* ***characterized by*** *the fact that* the supporting structure (1), more rigid and stable in the centre and increasingly yielding and flexible while reaching the ends, subjected to the action of the dragger (6), will flex and flatten towards the ski surface; fastened to the supporting structure there are wedges (2) and (3) that mainly occupy the space between the unloaded supporting structure and the ski (9), in the areas before and after the ski

binding (8); the wedges allow a free bending and flexing of the supporting structure, until they touch the ski surface (9) when, mediating between the two elements, they transfer the pressure applied by the dragger (6) to the ski surface (9), focusing it above the working device (7); the middle wedge (4), set at the tip of the ski binding (8) with the same function of the wedges (2) and (3), also allow the right settling of the bridge unto the ski and rules the angle of inflection of the whole assemblage.

2. Covering bridge for ski binding, following the above claim, in which the part of the supporting structure above the wedges (2) and (3), rectangular or trapezoidal in section, around 7-8 cm large and 15 mm thick, can hold intensive loads like those caused by the dragger (6), usually under 50kg, undergoing a minimal flexing.

3. Covering bridge for ski binding, following any of the above claims, in which the sections of the supporting structure set above the wedges (2) and (3), with a profile tapering towards the tips, easily flex even with loads under 1 kg.

4. Covering bridge for ski binding, following any of the above claims, **characterized by** the fact that, set onto the ski (9) and subjected to working load, has an angle of inflection of the whole assemblage from 0 to 6 cm.

5. Covering bridge for ski binding, following any of the above claims, in which the supporting structure is made of sandwiches of composite materials like fibre glass, carbon, Kevlar, dynema, resins and structural foams.

6. Covering bridge for ski binding, following any of the above claims, in which the wedges are made of elastomers, apt to modulate the warping of the more flexible sections of the structure (1), adhering to the ski surface (9) with the least warping.

7. Covering bridge for ski binding, following any of the above claims, in which one or more wedges (2 3 4) is fastened with arrangements that permits their anchoring or their moving, thus affecting the angle of inflection of the whole assemblage.

8. Covering bridge for ski binding, following any of the above claims, in which one or more wedges (2 3 4) is made with different elements put together with any arrangement that permits their junction or dismembering (joints, Velcro, etc.).

9. Covering bridge for ski binding, following any of the above claims, in which the supporting structure (1) is achieved with types of section and/or profile different from those proposed, that beget similar functions.

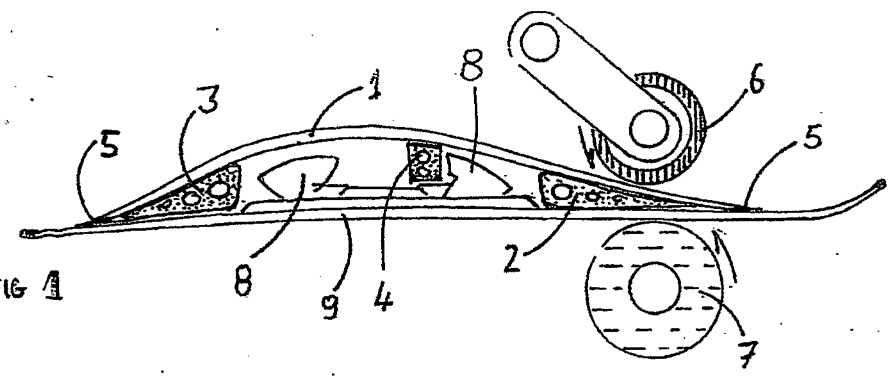

FIG 1

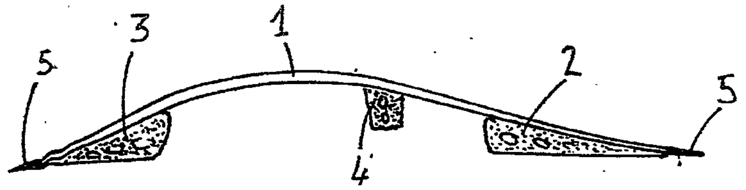

FIG 2

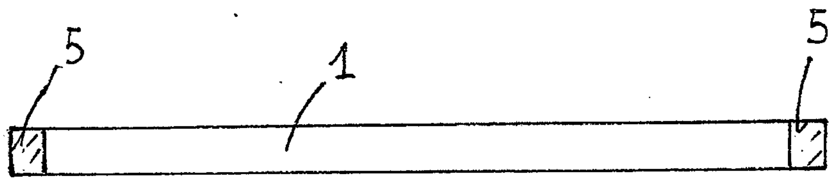

FIG 3

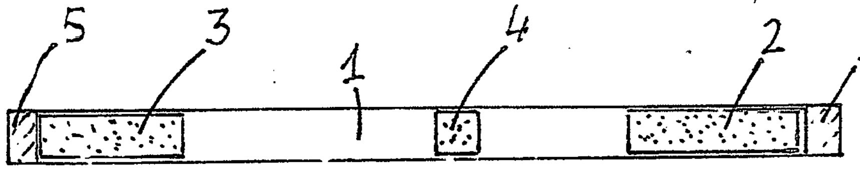

FIG 4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 13 00 5026

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 4 939 873 A (SMIALEK EDWARD B [US]) 10 July 1990 (1990-07-10) * the whole document * -----	1-9	INV. A63C11/02 A63C11/04
A	DE 23 30 449 A1 (TATENHORST, HANS) 10 January 1974 (1974-01-10) * the whole document * -----	1-9	
A	DE 87 02 768 U1 (NEUBER, RUDOLF [DE]) 30 April 1987 (1987-04-30) * the whole document * -----	1-9	

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	21 January 2014	Haller, E

1

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 00 5026

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-01-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4939873 A	10-07-1990	US 4939873 A WO 9200833 A1	10-07-1990 23-01-1992
DE 2330449 A1	10-01-1974	AT 313137 B DE 2330449 A1	11-02-1974 10-01-1974
DE 8702768 U1	30-04-1987	NONE	

EPO FORM P0459

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