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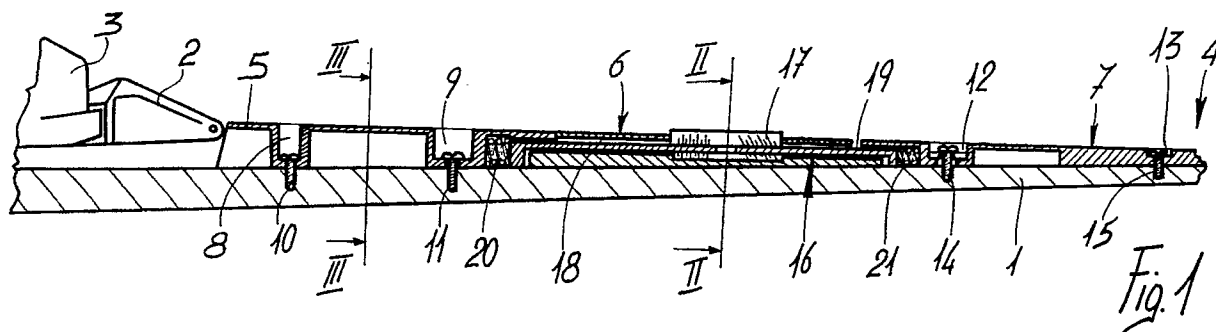
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Ski device.

In a ski having a ski binding member (2) for fastening a boot (3) to the ski (1), a device includes, at the interspace between the tip (4) of the ski and the binding (2), two or more covering elements (5,6,7) which are mutually interconnected by one or

more means (20,21) for varying flexibility and for damping vibrations. A ski device is thus obtained in which the skier can, according to the specific requirements, make the ski more or less flexible, thus improving its performance.



The present invention relates to a ski device.

Known skis currently have a variously configured internal structure, the function of which is to obtain the best compromise between a flexible ski, so as to adapt to the configuration of the snow surface while skiing, and a ski which is at the same time stiff enough to ensure adequate grip on the snow surface.

The structure of the ski must furthermore be able to absorb the vibrations imparted thereto while skiing, in order to effectively control and handle the ski.

These compromises are solved structurally during the manufacture of the ski and therefore cannot be adapted to the individual requirements of the skiers and to the distinct characteristics of the various types of snow.

The aim of the present invention is therefore to eliminate the disadvantages described above in known types by providing a ski device which allows to achieve an optimum damping of the vibrations imparted to the ski and allows the skier to customise the flexibility of a ski according to his own physical requirements or to the characteristics of the snow surface.

Within the scope of the above described aim, an important object is to provide a structurally simple device as well as reliable and safe in use.

Another object is to provide a device which can be applied to known skis as well.

Not least object is to provide a device which associates with the preceding characteristics those of having modest manufacturing costs and of being applicable to skis in a rapid and simple manner.

This aim, these objects and others which will become apparent hereinafter are achieved by a ski device, with which a tip element and a heel element are associated, characterized in that it comprises at least one covering element associated with a ski, said at least one covering element being arranged between a ski binding member and an end of said ski, said covering elements being mutually interconnected by flexibility controlling and vibration damping means.

Further characteristics and advantages of the invention will become apparent from the detailed description of some particular but not exclusive embodiments, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a side section view, taken along a median axis, of a first embodiment of the device according to the invention, associated with the ski;

figure 2 is a back section view, according to the line II-II of figure 1;

figure 3 is a back section view, according to the line III-III of figure 2;

figure 4 is a side view of a second embodiment of the device;

figure 5 is a broken section view of two adjacent covering elements, shown separated, of the device of figure 4;

figures 6 and 7 are perspective views of the two components shown in figure 5;

figure 8 is a side view of a further embodiment of the component parts shown in figure 5;

figure 9 is a section view, according to the line IX-IX of figure 8;

figure 10 is a section view, according to a transverse median plane, of one of the covering elements of figure 8;

figure 11 is a section side partial view of a further embodiment of the device;

figure 12 is a top view of an arrangement of the damping means of the device of figure 11;

figure 13 is a section side view of a further embodiment of the device.

With reference to the above figures, the reference numeral 1 indicates a single ski with which a tip element 2 and a heel element (not illustrated in the figure for the sake of simplicity) of a ski binding, are associated; a boot 3 is associable with said ski binding.

The device according to the invention comprises, at the interspace between the tip 4 and the tip element 2, or in the interspace between the rear end of the ski and the heel element, a first, second and third covering elements, respectively indicated by the numerals 5, 6 and 7.

Said covering elements may be resilient and thus be advantageously made of plastics.

The first covering element 5 is adjacent to the tip element 2 and has a box-like configuration, and may optionally embrace the tip element 2, at least partially. First and second transverse recesses or seats, indicated by the numerals 8 and 9, are formed on the first element 5, for arranging a first screw 10 and a second screw 11 for fastening to the ski 1.

The third covering element 7 also has a box-like configuration, and third and fourth transverse seats, indicated by the numerals 12 and 13, are defined thereon for arranging a third screw 14 and a fourth screw 15 for fastening to the ski 1.

The second covering element 6 is arranged in the interspace comprised between the first and third covering elements, and its ends are advantageously inserted with a tight fit within the corresponding ends of the first covering element 5 and of the third covering element 7.

The second covering element 6 has means for controlling the flexibility and for damping the vibrations of the ski 1; said means are arranged at an adapted fifth seat 16 which is defined axially and internally with respect to said second covering ele-

ment 6.

A pawl 17 is arranged centrally inside said fifth seat 16 and has a cylindrical configuration; its lateral surface is advantageously knurled and can be accessed outside said second covering element 6, which is internally provided with complementarily threaded regions.

The complementarily threaded ends of a first bar and of a second bar, which are indicated by the numerals 18 and 19 and have an L-shaped configuration at their other end, interact at said complementarily threaded regions.

Consequently, said L-shaped ends of the first and second bars are partially arranged within the adjacent box-like ends of the first covering element 5 and of the third covering element 7, and resilient elements, such as a first spring and a second spring, or resilient blocks made of plastics or rubber material, indicated respectively by the numerals 20 and 21, are interposed between said ends.

The use of the device is as follows: once the first, second and third covering elements have been associated with the ski, for example so that the first covering element totally or partially covers the tip element or the heel element of the ski binding, the skier can vary the degree of flexibility and/or of vibration damping of the ski by acting on the pawl 17 so as to vary the position of the first and second bars within the second covering element 6.

It has thus been observed that the device has achieved the intended aim and objects.

The device according to the invention is susceptible to numerous modifications and variations, all of which are within the scope of the same inventive concept.

Thus, for example, figures 4, 5, 6 and 7 illustrate a second embodiment, in which a first covering element 105, a second covering element 106 and a third covering element 107 are again provided.

Tabs 122a and 122b protrude at the ends of the first covering element and of the second covering element which are respectively adjacent to the second covering element and to the third covering element, and the adjacent ends of the second and third covering elements are slidably associated on said tabs.

In order to allow an optimum mutual movement of the various elements at the tabs 112a and 122b, a pair of pins 124a and 124b protrude proximate to the front perimetric edge 123 of the covering elements and can be slidably arranged at adapted pairs of slots 125a and 125b defined laterally to the adjacent ends of the second and third covering elements.

Means for controlling the flexibility and/or the vibration damping of the ski are constituted by

resilient elements 120, such as springs or rubber pads, which may even have different degrees of compressibility.

Said resilient elements 120 can be arranged at adapted sixth seats 126a and 126b which are defined axially to the first and second covering elements and to the second and third covering elements respectively at their mutually adjacent ends.

Figures 8, 9 and 10 illustrate a further embodiment of the device, in which only the interactions between the first covering element 205 and the second covering element 206 have been illustrated for simplicity.

The first covering element 205 again has, proximate to its end which is adjacent to the corresponding end of the second covering element 206, a tab 222a from which a pair of pins 224a protrude laterally and can slide in adapted slots 225a.

A slider 227, which can be operated by the skier, is slidably associated at the interspace between the adjacent ends of the first and second covering elements and therefore at the tab 222a, and has an essentially T-shaped configuration; its wings 228a and 228b slide in adapted and counter-shaped guides defined on said ends of said first and second covering elements.

The first, second and third covering elements may furthermore have, at the ends which interact with the ski 201, wings 229a and 229b which are slidably associable at adapted U-shaped profiled elements 230 which can be coupled directly to the ski 201.

Figures 11 and 12 illustrate a further embodiment, in which the means for controlling flexibility and for damping vibrations are constituted by one or more pistons 331 which have a body 332 from which a pair of stems 333a and 333b extend; said stems can be advantageously articulated transversely to the first covering element 305 and to the third covering element 307.

The axes of said pistons 331 may be parallel with respect to the longitudinal axis of the ski or may have a divergent or converging direction with respect to the tip of the ski.

Figure 13 illustrates still a further embodiment, wherein the flexibility controlling and damping vibrations means are constituted by a single resilient element 420 which is shaped complementarily to the first covering element 405, to the second covering element 406 and to the third covering element 407.

Said covering elements may also be constituted by a single element provided with adapted transverse recesses suitable for allowing differentiated articulation at said regions.

A ski device has thus been provided which allows to rapidly and easily change the characteris-

tics of the ski itself, passing from a resilient ski to a stiff one, limiting and controlling the vibrations thereof while skiing.

It is thus possible to also provide a variation in flexibility which is furthermore differentiated between the tip and the rear end of the ski.

The executable adjustments can be based on the different types of snow surface, on the different types of track and of course on the skill of the skier.

Finally, it should be noted that the covering elements can constitute an aesthetically advantageous element when they are applied to the ski, by partially or totally concealing the elements which constitute the ski fastening.

The materials and dimensions which constitute the individual components of the structure may naturally also be the most pertinent according to the specific requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Ski device, with which a tip element and a heel element are associated, characterized in that it comprises at least one covering element (5,6,7,105,106,107,205,206,207,305,307) associated with a ski (1,201), said at least one covering element being arranged between a ski binding member (2) and an end (4) of said ski, said covering elements being mutually interconnected by flexibility controlling and vibration damping means (20,21,120,331,420).
2. Device according to claim 1, characterized in that it comprises a first (5), a second (6) and a third (7) covering elements, which have a box-like shape, a plurality of transverse seats (8,9,12,13) being defined on one or more of said covering elements.
3. Device according to claim 2, characterized in that said transverse seats are adapted to receive screws (10,11,14,15) for fastening to said ski.
4. Device according to claim 1, characterized in that said covering elements (205) have, at the ends which rest on said ski (1), wings (229a,229b) which can be slidably associated with adapted U-shaped profiled elements

(230) rigidly associated with said ski (201).

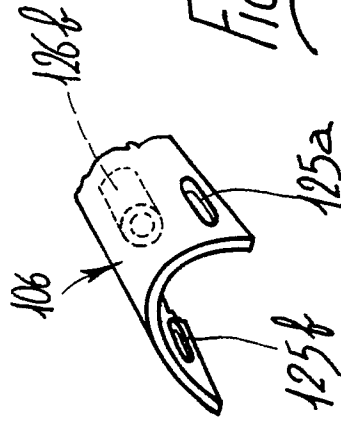
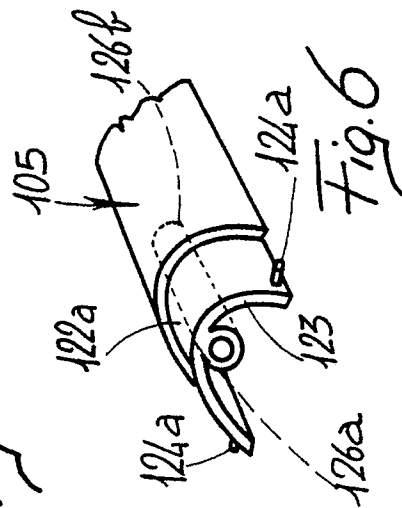
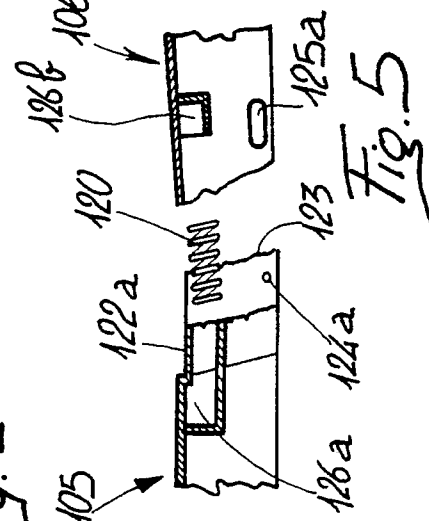
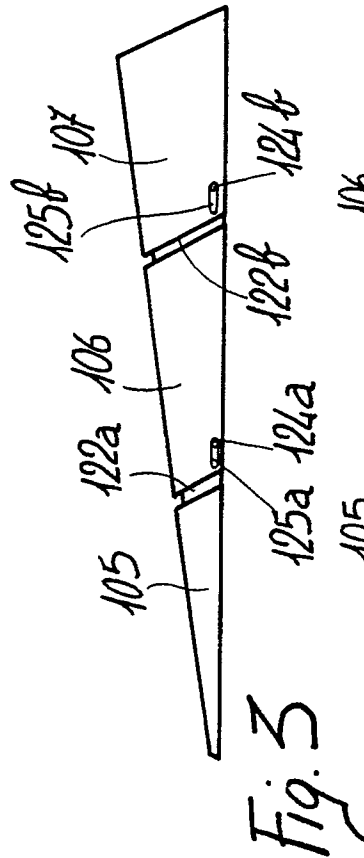
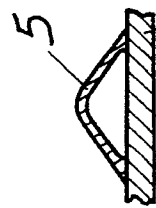
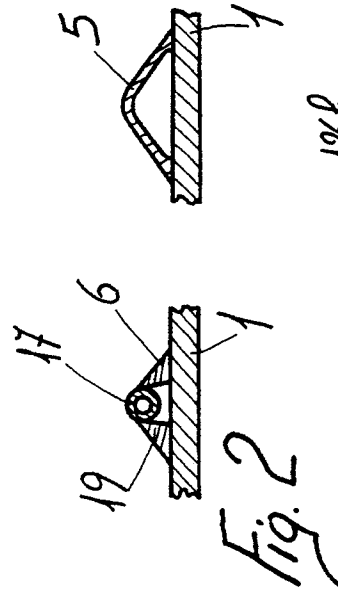
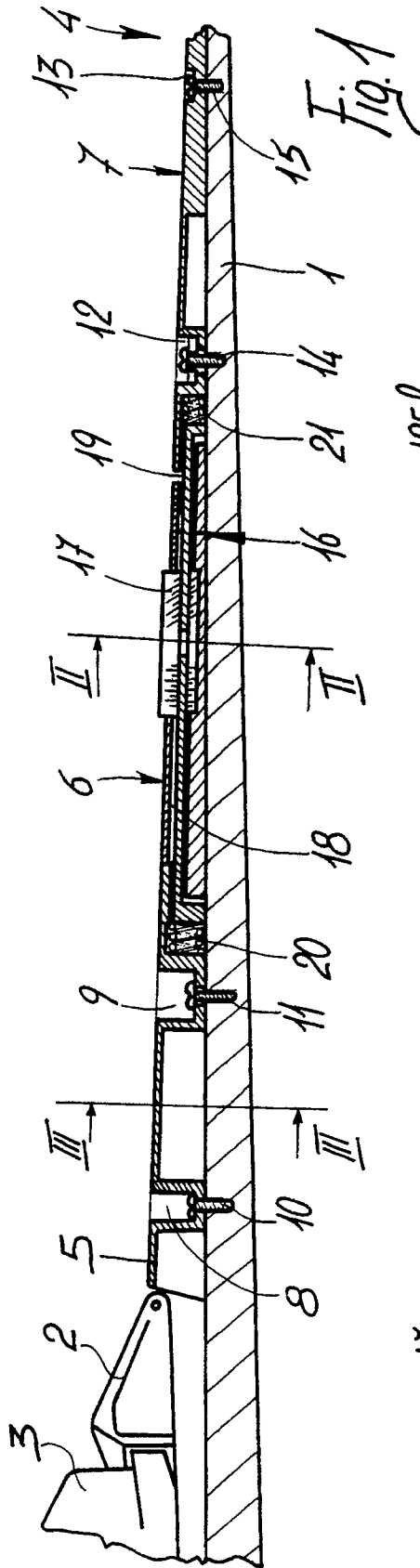
5. Device according to claim 1, characterized in that said second covering element (6), the ends whereof are associated with a tight fit between the corresponding adjacent ends of said first (5) and third (7) covering elements, accommodates said flexibility controlling and vibration damping means of said ski, said means being arranged at an adapted fifth seat (16) defined axially and internally with respect to said second covering element.
6. Device according to claim 5, characterized in that a pawl (17) is arranged centrally at said fifth seat, said pawl having a cylindrical configuration with a knurled lateral surface which can be operated by the skier, said second covering element being internally provided with two complementarily threaded regions which act as seats for the L-shaped ends of a first bar (18) and of a second bar (19), the other ends of said bars being arranged inside said first and third covering elements with the axial interposition of at least one resilient element.
7. Device according to claim 1, characterized in that it comprises a first (105), a second (106) and a third (107) covering element, arranged in sequence, said covering elements having, at their adjacent ends, tabs (122a,122b) which are partially contained within the end of the adjacent covering element and are suitable for allowing mutual movement between said first and second covering elements and between said second and third covering elements.
8. Device according to claim 7, characterized in that a pair of pins (124a,124b) protrude laterally from said tabs which protrude from at least said first and second covering elements, proximate to their front perimetric edge (123), said pins being slidably arrangeable at an adapted pair of slots (125a,125b) defined longitudinally and laterally with respect to said second and third covering elements.
9. Device according to claim 8, characterized in that said flexibility controlling and vibration damping means are constituted by resilient elements (120) which are interposed between said first and second covering elements and between said second and third covering elements.
10. Device according to claim 9, characterized in that said resilient elements are constituted by springs and rubber pads which may also have

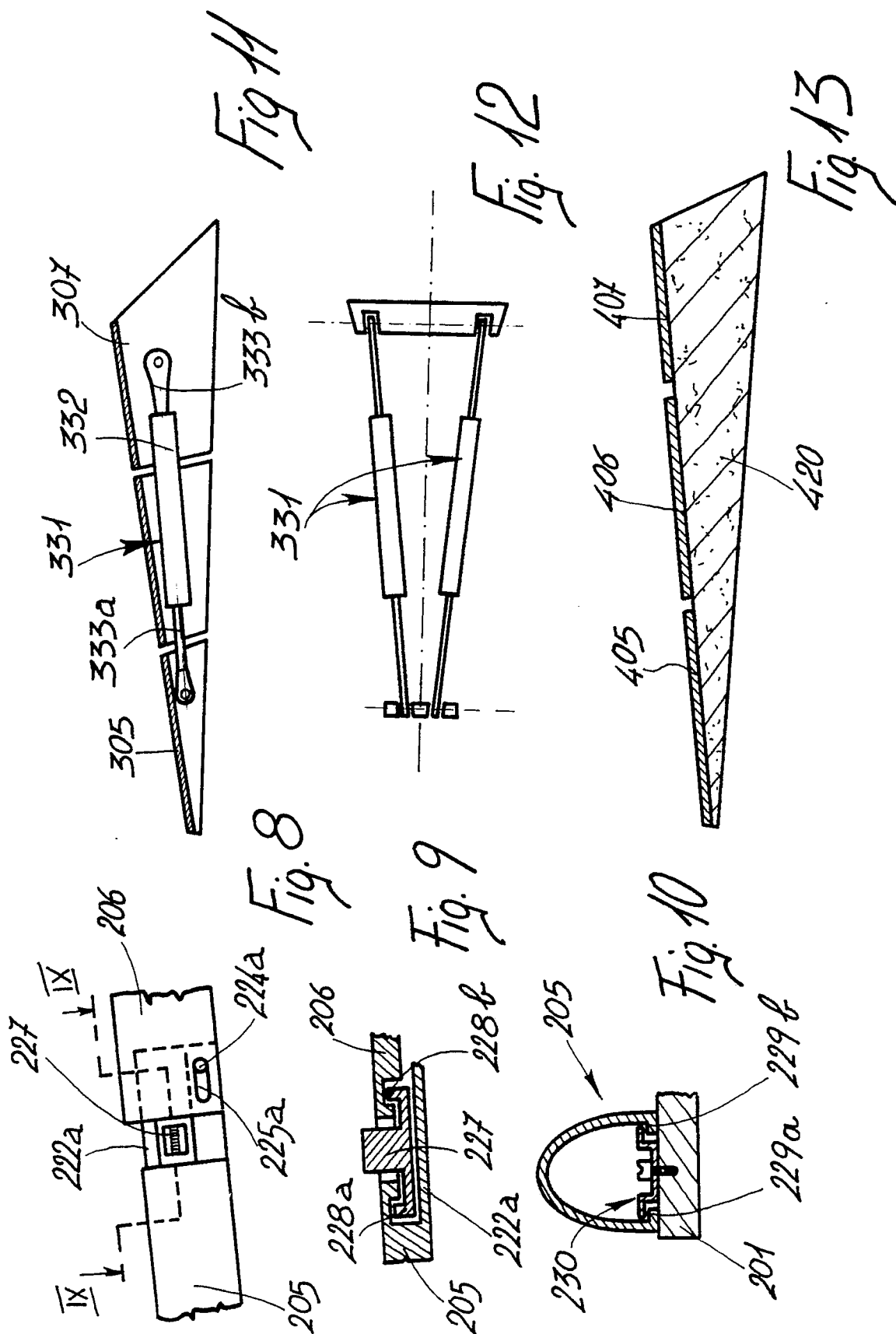
different degrees of compressibility.

11. Device according to claim 10, characterized in that said resilient elements are arranged within adapted sixth seats (126a,126b) defined longitudinally with respect to said first and second covering elements and to said second and third covering elements at their respective mutually adjacent ends. 5
12. Device according to claim 1, characterized in that at least one T-shaped slider (227) is slidably associated at said tabs (222a) , the wings (228a, 228b) of said slider sliding in adapted and complementarily shaped guides defined on the adjacent ends of two of said first, second and third covering elements. 10 15
13. Device according to claim 1, characterized in that said flexibility controlling and vibration damping means are constituted by pistons (331) which have a body (332) from which a pair of stems (333a,333b) extends, said stems being articulated at their ends transversely to at least said first (305) and third covering elements (307). 20 25
14. Device according to claim 1, characterized in that said flexibility controlling and vibration damping means are constituted by a single resilient element (420) inserted between said first (405), second (406) and third (407) covering elements. 30
15. Device according to claim 1, characterized in that said resilient covering elements have, at their mutually adjacent ends, one or more interconnection bridges. 35
16. Device according to claim 1, characterized in that said covering element has a wedge-like configuration. 40
17. Device according to claim 1, characterized in that said covering element at least partially embraces said ski binding member (2). 45

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EUROPEAN SEARCH REPORT

Application Number

EP 91 10 9034

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	AT-B-3 768 90 (HATSCHINGER) * Figures 1,2; page 3, lines 15-37 * - - - -	1,9,10,17	A 63 C 5/07
A	FR-A-1 407 710 (M.W. BUCHBERGER) * Figure; page 41, column 1, lines 10-16,32-35 * - - - -	1,9	
A	AT-B-3 741 13 (FISCHER GESELLSCHAFT m.b.H.) * Figures 1,2; page 4, lines 34-37 * - - - -	1	
A	FR-A-1 269 049 (M.W. FERREZ) * Figures 1-5; page 1, column 1, lines 8-18 * - - - - -	1	
The present search report has been drawn up for all claims			<div>TECHNICAL FIELDS SEARCHED (Int. Cl.5)</div> <div>A 63 C</div>
Place of search		Date of completion of search	Examiner
The Hague		17 July 91	STEEGMAN R.
<div>CATEGORY OF CITED DOCUMENTS</div> <div>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</div> <div>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</div>			