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(54) **Security device for elastic ropes and elastic rope comprising this device**

(57) Security device for elastic ropes which comprise a bundle (1) of elastic threads with the ends provided with fixing members (2, 3), which device comprises a substantially inelastic hose (5; 6; 7) which has a length substantially equal to or greater than the maximum useful

elongation of the bundle (1) of elastic threads and is suitable for being fastened to the fixing members (2, 3) for enveloping the bundle (1) of elastic threads. The present invention also relates to an elastic rope comprising said security device.

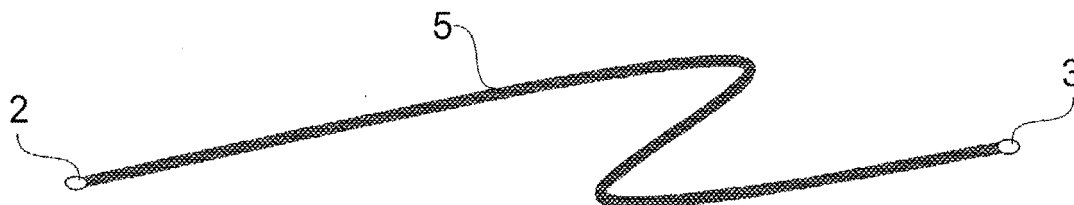


Fig. 1

EP 1 649 903 A1

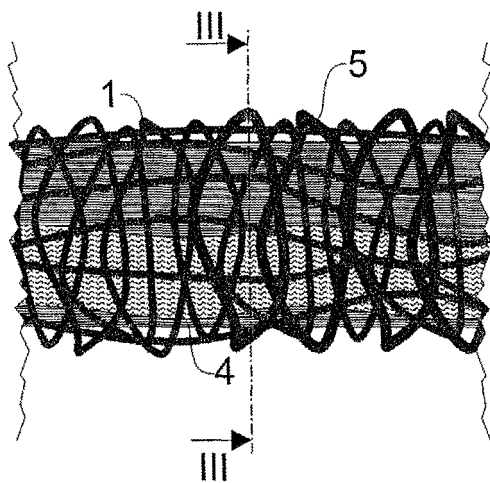


Fig. 2

Description

[0001] The present invention relates to a security device, and in particular to a device which can be applied to an elastic rope for jumping sports or game/sport playgrounds, such as for example the "bungee jumping", fairs or amusement machines, for improving the security during the use. The present invention also relates to an elastic rope comprising said security device.

[0002] The known elastic ropes comprise a bundle of elastic threads with the ends provided with fixing members for anchoring one or more persons to the rope and hanging the rope to a support structure. A security strip is fastened to the fixing members for preventing an accidental separation thereof, i.e. the fall of the mass supported by the rope, in case of breaking of the bundle of elastic threads. However, the stumps of these elastic threads may violently hit the user and/or the persons in the vicinity, so as to hurt them.

[0003] It is therefore an object of the present invention to provide a rope which is free from said disadvantage. Said object is achieved with a security device and a rope, the main features of which are disclosed in claims 1 and 10, respectively, while other features are disclosed in the remaining claims.

[0004] Thanks to its particular hose, the device according to the present invention can contain the stumps of any broken elastic thread of an elastic rope, which therefore is not dangerous in case of a total or partial breaking of the bundle comprising these threads.

[0005] Said hose can comprise particular reticular structures for allowing the inspection of the state of the elastic threads contained therein.

[0006] According to a particular aspect of the invention, the hose can have a high tensile strength against the breaking, so as to accomplish the task of the security strip for substituting it or reinforcing it anyway, in case of breaking and/or excessive elongation of the elastic threads.

[0007] The hose can also be made of particular materials, so as to be resistant, light and/or easy to be manufactured, sewn and/or coupled with an elastic rope, also of the known kind.

[0008] Further advantages and features of the security device and of the elastic rope according to the present invention will become clear to those skilled in the art from the following detailed and non-limiting description of some embodiments thereof, with reference to the attached drawings, wherein:

- figure 1 shows a perspective view of a rope comprising the first embodiment of the security device;
- figure 2 shows a partial side view of the rope of figure 1;
- figure 3 shows a view sectioned along plane III-III of figure 2;
- figure 4 shows a detail of the hose of the rope of figure 1;

- figure 5 shows a partial side view of the rope of figure 1, when it is tight;
- figure 6 shows a view sectioned along plane VI-VI of figure 5;
- figure 7 shows a partial side view of a rope comprising the second embodiment of the security device;
- figure 8 shows a view sectioned along plane VIII-VIII of figure 7;
- figure 9 shows a partial side view of a rope comprising the third embodiment of the security device; and
- figure 10 shows a view sectioned along plane X-X of figure 9.

[0009] Referring to figures 1 to 4, it is seen that a known elastic rope comprises a bundle 1 of elastic threads with the ends provided with fixing members 2, 3, for example reels, plates, bars, rings, hooks, snap-hooks or the like, for anchoring one or more persons or other bodies to the rope and/or hooking the rope to a support structure. A security cable 4, for example a nylon strip, which is substantially inelastic and has a length substantially equal to the length of the maximum useful elongation, i.e. the maximum elongation in normal conditions of use, of bundle 1, can be fastened and/or joined to the fixing members 2, 3 for preventing an accidental separation of the fixing members 2, 3 in case of breaking of the elastic threads of bundle 1.

[0010] According to the first embodiment of the invention, a hose 5, which is substantially inelastic and has a length substantially equal to or greater than the length of the maximum useful elongation of bundle 1, is fastened and/or joined to the fixing members 2, 3, for example by means of eyelets, laces or bands, and envelops bundle 1. In the present embodiment, hose 5 has a reticular structure made of polypropylene, preferably with a square weft having a side L comprised between 3 and 6 cm and a diameter comprised between 4 and 8 mm, as shown in figure 4. The maximum tensile strength of the net of hose 5 is preferably greater than 200 Kg/m².

[0011] When the rope is tight, hose 5 passes from a slack conformation to a stretched conformation, shown in figures 5 and 6.

[0012] Referring to figures 7 and 8, it is seen that in the second embodiment of the invention hose 6 comprises a net closer than the previous one, in particular made of polyethylene with a square weft having a side comprised between 1 and 3 mm and a diameter comprised between 0,1 and 2 mm.

[0013] Referring to figures 9 and 10, it is seen that in the third embodiment of the invention hose 7 is free from the security cable 4, is made of a material comprising carbon and/or aramide fibers, for example Kevlar®, and has a maximum tensile strength greater than 17 kN.

Claims

1. Security device for elastic ropes which comprise a

bundle (1) of elastic threads with the ends provided with fixing members (2, 3), **characterized by** comprising a substantially inelastic hose (5; 6; 7) which has a length substantially equal to or greater than the maximum useful elongation of the bundle (1) of elastic threads and is suitable for being fastened and/or joined to the fixing members (2, 3) for enveloping the bundle (1) of elastic threads.

2. Security device according to the previous claim, **characterized in that** the hose (5; 6) has a reticular structure. 10
3. Security device according to the previous claim, **characterized in that** the hose (5) comprises a polypropylene net. 15
4. Security device according to claim 2 or 3, **characterized in that** the net has a square weft with a side (L) comprised between 3 and 6 cm and a diameter comprised between 4 and 8 mm. 20
5. Security device according to claim 2, **characterized in that** the hose (6) comprises a polyethylene net. 25
6. Security device according to claim 2 or 5, **characterized in that** the net has a square weft with a side comprised between 1 and 3 mm and a diameter comprised between 0,1 and 2 mm. 30
7. Security device according to one of claims 2 to 6, **characterized in that** the maximum tensile strength of the net is greater than 200 Kg/m².
8. Security device according to one of the previous claims, **characterized in that** the hose (7) is made of a material comprising carbon and/or aramide fibers. 35
9. Security device according to one of the previous claims, **characterized in that** the hose (7) has a maximum tensile strength greater than 17 kN. 40
10. Elastic rope comprising a bundle (1) of elastic threads with the ends provided with fixing members (2, 3), **characterized in that** said bundle (1) is enveloped in a hose (5; 6; 7) of a device according to one of the previous claims, which is fastened and/or joined to the fixing members (2, 3). 45
11. Rope according to the previous claim, **characterized in that** a security cable (4), which is substantially inelastic and has a length substantially equal to the length of maximum useful elongation of the bundle (1) of elastic threads, is fastened and/or joined to the fixing members (2, 3). 50 55

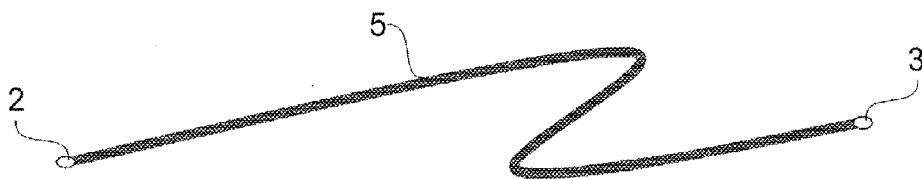


Fig. 1

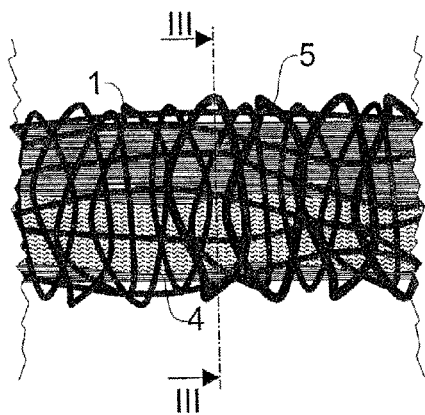


Fig. 2

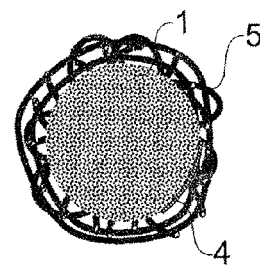


Fig. 3

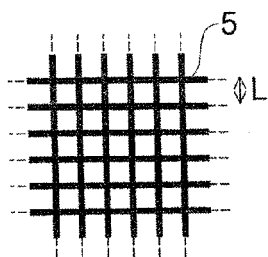


Fig. 4

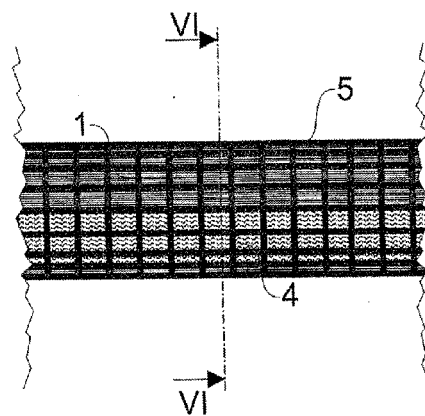


Fig. 5

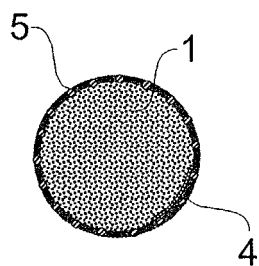


Fig. 6

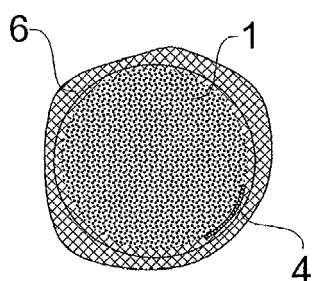


Fig. 8

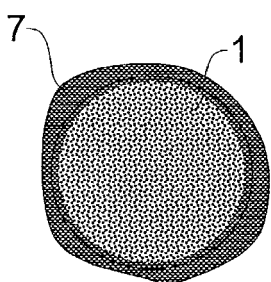


Fig. 10

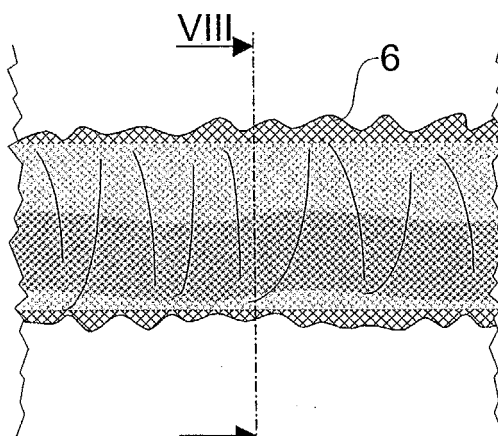


Fig. 7

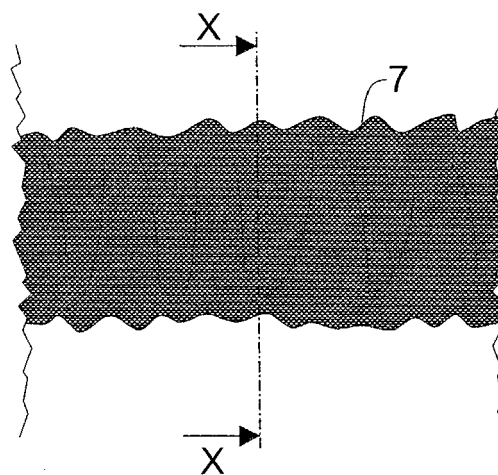


Fig. 9



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EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5787

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.7)
6 X	US 5 205 803 A (ZEMITIS ET AL) 27 April 1993 (1993-04-27) * the whole document *	1-11	A63B5/16
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A63B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		10 May 2005	Knoflachner, N
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 42 5787

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The members are as contained in the European Patent Office EDP file on
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