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(54) **TRANSITION DEVICE**

(57) The present invention concerns a transition device with joining means for use in joining athletic appliances, the transition device at least including a length and a longitudinal direction, an extension spring member and a joining part with joining means, the joining part including at least two flaps, each flap including at least a first side, a second side, a first edge and a second edge, where at least the first edge of each flap is connected with the extension spring member and where at least the

first side or second side of each flap includes joining means, by which is achieved an improved solution for joining athletic appliances, where a transition device can be joined to e.g. a first appliance and a second appliance, but where the transition device includes at least one resilient element by which the joining means cannot be pulled or torn from each other when a gymnast, for example, lands on an appliance close to the joining means.

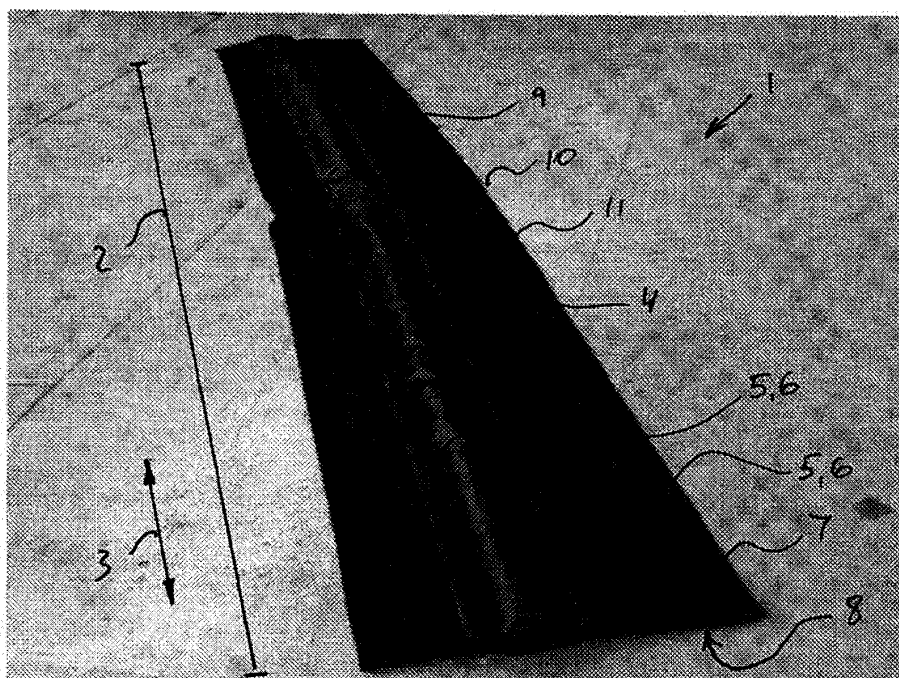


Fig 1

Description

Field of the Invention

[0001] The present invention concerns a transition device with joining means for use in joining athletic appliances, an athletic appliance including at least one transition device, and a method for using a transition device.

Background of the Invention

[0002] In connection with performing jumping, trampoline or tumbling gymnastics, it is common to use various forms of floor pads/floor mats/landing mats, including air-filled products.

[0003] Through the years this type of products has found wide application in the world of gymnastics and is used in connection with a great number of gymnastics. The products in question are used as individual products or appliances, however, it is very common to use several products in conjunction, why these products are typically equipped with joining means in the form of strips of Velcro tapes sewn or glued thereon. By joining such products with Velcro tapes, ample and secure joining is achieved which is easily separated and jointed according to need. Examples of products that may be joined with floor pads/floor mats/landing mats can be wedge mats, somersault vaulting boxes, roll vaulting boxes, foam vaulting boxes, and other types of appliances.

[0004] On products as mentioned above, there are thus arranged strips of Velcro tape along the edges such that these strips can be brought into engagement and thereby secure respective appliances to each other.

[0005] The disadvantage of this kind of joining is that the joining means can be pulled or torn apart when a gymnast e.g. lands on one appliance close to the joining means.

[0006] It is also known to use a transition device for filling the gap between a first appliance and a second appliance, where the transition device and the appliances are all provided with joining means, and where the transition device is joined with the first appliance and the second appliance, respectively.

[0007] The disadvantage of this kind of joining is also that the joining means can be pulled or torn apart when a gymnast e.g. lands on one appliance close to the joining means.

[0008] EP 2786786 A1 discloses e.g. a gymnastic appliance that is built up of a first appliance and a second appliance, where both appliances have a top side, a bottom side and edge sides, and where between the appliances there is arranged a transition device, however a transition device that cannot be stretched. The two appliances and the transition device are provided with joining means constituted by Velcro tapes, and therefore it is the Velcro tapes that are subjected to the tensile load when gymnasts e.g. land on the top sides of the appliances.

Object of the Invention

[0009] It is the object of the invention to indicate an improved solution for joining athletic appliances, where a transition device can be joined to e.g. a first appliance and a second appliance, but where the transition device includes at least one extension spring member. The joining means are thereby not to absorb the load, and therefore the joining means cannot be pulled or torn from each other when a gymnast, for example, lands on an appliance close to the joining means, as the extension spring member will yield. Therefore, the important issue is the presence of an extension spring member since the extending properties are crucial for relieving the load to which the joining means are subjected.

[0010] A further object of the invention is also that the joining means on the individual athletic appliances are not loaded and worn to such a degree that it results in a need for replacing the joining means due to inferior attaching capability.

Description of the Invention

[0011] According to a first aspect of the invention, the above indicated object is achieved by a transition device as described by introduction and as described in the preamble of claim 1, namely a transition device with joining means for use in joining athletic appliances, the transition device at least including a length and a longitudinal direction, an extension spring member and a joining part with joining means, the joining part including at least two flaps, each flap including at least a first side, a second side, a first edge and a second edge, where at least the first edge of each flap is connected with the extension spring member and where at least the first side or second side of each flap includes joining means.

[0012] In a preferred embodiment, the extension spring member can perform a reversible deformation where the extension spring member can be extended as well as being capable of returning to its original shape. The focus is therefore on the extending function.

[0013] This enables joining at least two athletic appliances provided with joining means to each other and at the same time avoid that the joining means are pulled or torn apart when a gymnast e.g. lands on an appliance close to the joining means. This is avoided in that the extension spring member of the transition device yields, preferably extending between 0 and 10 cm, however preferably between 3 and 6 cm, and such that the load is not only absorbed by the joining means.

[0014] In a preferred embodiment, the joining part includes two flaps disposed substantially in the same plane at each their side of the extension spring member. It is hereby possible that both flaps can be connected to the top side of an athletic appliance.

[0015] In another preferred embodiment, the joining part includes two flaps disposed substantially at right angles to each other. One flap may hereby be connected

to the top side of an athletic appliance, whereas the second flap can be connected to the edge of an athletic appliance.

[0016] In a third embodiment, the joining part includes two flaps, each capable of being connected to the top side of an athletic appliance and at the same time to the bottom side of yet an athletic appliance, provided that the flaps have joining means at both sides.

[0017] In a fourth preferred embodiment, the joining part includes three flaps of which two flaps are disposed substantially in the same plane whereas the third flap is disposed substantially at right angles to the two other flaps. The two flaps may hereby both be connected to the top side of an athletic appliance, whereas the third flap can be connected to the edge of the at least one athletic appliance. The two flaps located in the same plane can be connected at the same time to the bottom side of yet an athletic appliance, provided that the flaps have joining means at both sides.

[0018] In a fifth preferred embodiment, the joining part includes four flaps of which the first two flaps are disposed substantially in the same plane, wherein the two flaps each can be connected to the top side of an athletic appliance. The last two flaps are also disposed substantially in the same plane, but in a plane in parallel with the two first flaps. The remaining flaps can also be connected to the top side of an athletic appliance, that e.g. is in the form of thin mats placed upon mattresses.

[0019] The length of a transition device may vary, but in a preferred embodiment, the length of a transition device fits the width of a common landing mat or floor mat, which is 2 metres. For example, two transition devices, each being two metres, can be laid in continuation of each other for use e.g. in assemblies that are 4 metres long.

[0020] Some athletic appliances have joining means along one side, along two sides or along several sides, faces and/or edges, and the invention indicated above is very attractive in connection with joining a large number of different or uniform appliances irrespective of the location at which the respective joining means are arranged. These may be athletic appliances that are foam-filled and/or air-filled, made of wood, plastic or other suitable materials, including traditional or more modern appliances, such as e.g. parkour appliances, that may be joined according to the invention.

[0021] The joining means are in a preferred embodiment Velcro tapes, but may e.g. be buttons, press studs, zippers, hooks or clasps.

[0022] The extension spring member may further include cover means for covering and possibly shielding the extension spring member partly or entirely from the surroundings. It is a condition that the cover means are flexible and therefore able to adapt to the movements of the extension spring member.

[0023] In a preferred embodiment, the cover means includes a pocket in which the extension spring member is provided and where the extension spring member

therefore is well shielded from the surroundings and well protected against wear, among others.

[0024] Where the cover means include a pocket completely enclosing the extension spring member, the joining means are consequently connected to the cover means and thus indirectly to the extension spring member.

[0025] In a second preferred embodiment where the two flaps of the joining parts are disposed substantially in the same plane, it is only the part of the cover means facing upwards and thus away from the joined gymnastic appliances that is visible. Thereby it is possible to have cover means only at the top side of the transition device.

[0026] In a second aspect, the present invention also concerns a transition device wherein the extension spring member further includes at least one inflatable chamber and at least one valve.

[0027] By inflatable is meant here the option of using and pumping a desired gas or a gas mixture, such as e.g. and preferably air, into the at least one inflatable chamber. By an inflatable chamber is meant a closed compartment to which air by means of a valve can be supplied or removed.

[0028] Alternatively, it may be a multi-chamber system wherein the chambers are interconnected, and where one valve therefore is sufficient.

[0029] In a further alternative embodiment, there may be several separate chambers above each other, side-by-side, or externally of each other. It may thus be a system with several valves.

[0030] Each valve may also have an overpressure device such that the pressure is regulated, thereby ensuring that the extension spring member will not rupture. An overpressure device can thus be an overpressure valve regulating the pressure.

[0031] In a third aspect, the present invention also concerns a transition device wherein the extension spring member includes at least one foam element.

[0032] When a load is applied to an athletic appliance this will further enable changing the shape of the foam element without breaking the foam element and without the joining means being pulled or torn apart.

[0033] In a preferred embodiment, the foam element is a foam tube. It is therefore expedient to use cover means in the form of a 360° pocket, preferably circular, whereby it is easy and simple to place and possibly replace the foam tubes. The foam tubes may have different lengths that may be assembled by means of a joining member, which in a preferred embodiment is a tube piece or a rod on which the foam tubes can be pushed in over from both ends of the tube piece or rod.

[0034] In a second preferred embodiment, the foam element is a foam stick, and in further embodiments the foam element is designed specifically to fit the gaps between the desired athletic appliances, with a cross-sectional shape that is e.g. triangular, convex or concave.

[0035] By the embodiments where the extension spring member includes a pocket, a foam element can

readily be replaced, and thereby it is also possible to replace e.g. a foam element with one elastic property with a foam element with another elastic property. In order to prevent the foam element from falling/moving out of the pocket, in a preferred embodiment there is an opening/closable end in the extension spring member of the transition device.

[0036] In a preferred embodiment, the foam element is made of polyurethane.

[0037] It will thus also be possible to combine a foam element with an inflatable chamber.

[0038] In a fourth aspect, the present invention also concerns a transition device wherein the extension spring member includes at least one rubber band.

[0039] When a load is applied on an athletic appliance, this will enable changing the shape of the rubber band such that the joining means are not pulled or torn apart.

[0040] In a preferred embodiment, the rubber band is directly connected with the joining part, and the cover means may in an embodiment suffice with covering one side of the rubber band, i.e. preferably the parts of the rubber band and the transition device that are visible after joining a number of athletic appliances.

[0041] By the embodiments where the extension spring member includes a pocket, inside the pocket there is at least one elastic or rubber band preferably disposed in the same plane as the one in which the joining part is placed externally of the pocket. Where the at least two flaps of the joining part are not disposed in the same plane, the at least one rubber band or elastic is disposed in continuation of the joining part which is provided externally of the pocket.

[0042] In a fifth aspect, the present invention also concerns a transition device wherein the extension spring member includes at least one spring.

[0043] When an athletic appliance is loaded, this will enable pulling the spring such that the spring becomes longer and such that the joining means are not pulled or torn apart.

[0044] In a preferred embodiment, the spring is directly connected with the joining part, and the cover means may in an embodiment suffice with covering the parts of the spring and of the transition device that are visible after joining with a number of athletic appliances.

[0045] By the embodiments where the extension spring member includes a pocket, inside the pocket there is provided at least one spring preferably disposed in the same plane in which the joining part is placed externally of the pocket.

[0046] In a preferred embodiment, several springs are mounted transversely to the longitudinal direction of the transition device, where the springs preferably are identical and with the same elastic modulus, though the springs may be with different elastic modulus as well.

[0047] In a further preferred embodiment, the springs can be disposed mutually offset at different planes or at different mutual angles, but where the springs are capable of absorbing the load on the athletic appliances.

[0048] In a sixth aspect, the present invention also concerns a transition device wherein the first and second sides of the at least one flap of the joining part include joining means, respectively.

5 **[0049]** This will enable making the transition device more flexible such that the at least one flap can be connected to more than one athletic appliance and can be connected to a mat and a mattress lying upon each other, for example.

10 **[0050]** In a preferred embodiment, the first side and second side of each flap of the joining part include joining means. Each of the flaps can hereby be connected to the top side or bottom side of at least one athletic appliance.

15 **[0051]** In a second preferred embodiment, where the first side and second side of each flap both include joining means, the flaps can be connected to the top side of an athletic appliance and to the bottom side of another athletic appliance, respectively, if located in the same plane.

20 **[0052]** In a seventh aspect, the present invention also concerns a transition device where the joining means on each flap either includes Velcro tape only with hooks or only with loops.

25 **[0053]** This may ensure that the Velcro tape cannot be turned upside down, and additionally there may be some production advantages associated with such a solution as not all types of Velcro tapes are equally easy to handle in the different situations.

30 **[0054]** In an eighth aspect, the present invention also concerns a transition device where joining means on each side of a flap both includes Velcro tape with hooks and with loops.

35 **[0055]** This enables coupling two appliances together without regard to respective parts having one or the other type of Velcro tape as there are no longer specific male-female parts, but so that in a preferred embodiment universal Velcro tapes can be coupled with corresponding Velcro tapes.

40 **[0056]** In an alternative embodiment, the joining means include Velcro tape with hooks as well as with loops on each flap, where the hooks e.g. are in one row or a section/area by itself, whereas the loops are in another row or in another section/area by itself.

45 **[0057]** In a ninth aspect, the present invention also concerns an athletic appliance including at least one transition device according to the invention, the athletic appliance being of the type typically used in connection with performing jumping, trampoline or tumbling, wherein the athletic appliance includes at least a first appliance and a second appliance, wherein at least one of the appliances, e.g. an elastic pad/element, includes a top side, a bottom side and a number of edge sides, and further including joining means at or along at least part of the top side, bottom side and/or edge sides of the appliance, and wherein the first and the second appliance via the joining means are adapted for mutual joining by transition devices, wherein this joining is effected by complementary joining means arranged on respective appliances

and transition devices that together constitute a gymnastic appliance.

[0058] This enables joining athletic appliances by a transition device where the transition device includes at least one extension spring member. The joining means cannot thereby be pulled or torn from each other when a gymnast, for example, lands on an appliance close to the joining means as the extension spring member will yield.

[0059] In a tenth aspect, the present invention also concerns a method for using a transition device according to the invention for joining athletic appliances of the type typically used in connection with performing jumping, trampoline or tumbling, wherein at least one athletic appliance, e.g. an elastic pad/element, includes a top side, a bottom side and a number of edge sides, and further including joining means at or along at least part of the top side, bottom side and/or edge sides of the appliance, and wherein the first and the second appliance via the joining means are adapted for mutual joining by transition devices, wherein this joining is effected by complementary joining means arranged on respective appliances and transition devices that together constitute an athletic appliance, and wherein the method includes at least the following steps:

- providing a first athletic appliance with joining means;
- providing a second athletic appliance with joining means;
- providing a transition device with joining means;
- providing and mounting at least one transition device with joining means including Velcro tape between the athletic appliances.

Description of the Drawing

[0060] In the following, the invention is explained in more detail in connection with the drawing, wherein:

- Fig. 1 shows a perspective view of a transition device;
- Fig. 2 shows a cross-section of a transition device in an embodiment;
- Fig. 3 shows a transition device as on Fig. 2 but with the transition device in a perspective view;
- Fig. 4 shows a cross-section of a transition device in a second embodiment;
- Fig. 5 shows a cross-section of a transition device in a third embodiment;
- Fig. 6 shows the elements of an athletic appliance including a transition device;
- Figs. 7-14 show a cross-section of transition devices in various embodiments;
- Fig. 15 shows a transition device in an embodiment with chamber and valve in perspective view; and

Fig. 16 shows a transition device in an embodiment with two chambers and two valves in perspective view.

5 List of designations

[0061]

- | | |
|----|---|
| 1 | transition device |
| 2 | length |
| 3 | longitudinal direction |
| 4 | extension spring member |
| 5 | joining part |
| 6 | flap |
| 7 | first side, flap |
| 8 | second side, flap |
| 9 | first edge, flap |
| 10 | second edge, flap |
| 11 | joining means/Velcro tape, transition device |
| 12 | cover means |
| 13 | foam element |
| 14 | rubber band |
| 15 | spring |
| 16 | athletic appliance |
| 17 | first appliance |
| 18 | second appliance |
| 19 | top side |
| 20 | bottom side |
| 21 | edge side |
| 22 | joining means/Velcro tape, athletic appliance |
| 23 | first plane |
| 24 | second plane |
| 25 | third plane |
| 26 | inflatable chamber |
| 27 | valve |

Detailed Description of Embodiments of the Invention

[0062] Fig. 1 shows a transition device 1 according to the invention in perspective view, where the transition device includes a length 2 and a longitudinal direction 3, an extension spring member 4 and a joining part 5. The joining part 5 includes two flaps 6, each flap 6 including at least a first side 7, a second side 8, a first edge 9 and a second edge 10, where the first edge 9 of each flap is connected with the extension spring member 4 and where at least the first side 7 or second side 8 of each flap includes joining means 11.

[0063] Fig. 1 shows an embodiment where the joining part 5 of the transition device includes two flaps 6 of different dimensions. In other embodiments, the transition device 1 may have flaps 6 of the same dimension.

[0064] Fig. 2 shows a cross-section of a transition device 1 in an embodiment from which it appears that the transition device 1 has an extension spring member 4 and a joining part 5. The joining part 5 includes two flaps 6, each flap 6 including at least a first side 7 and a second

side 8. The extension spring member 4 in this embodiment includes cover means 12 surrounding at least one foam element 13.

[0065] Fig. 3 shows a transition device 1 in the same embodiment as shown on Fig. 2, but where the transition device 1 is in perspective view, and where the foam element 13 of the extension spring member is separated from the cover means 12 of the extension spring member.

[0066] Fig. 4 shows a cross-section of a transition device 1 in a second embodiment from which it appears that the transition device 1 has an extension spring member 4 and a joining part 5. The extension spring member 4 in this embodiment includes cover means 12 that only partially surround a resilient/elastic element in the form of at least one rubber band 14.

[0067] Fig. 5 shows a cross-section of a transition device 1 in a third embodiment from which it appears that the transition device 1 has an extension spring member 4 and a joining part 5. The extension spring member 4 in this embodiment includes cover means 12 that only partially surround a resilient element in the form of at least one spring 15.

[0068] Fig. 6 shows the elements of an athletic appliance 16, including a first appliance 17 and a second appliance 18, the first appliance 17 and the second appliance 18 both including a top side 19, a bottom side 20, and a number of edge sides 21, and joining means 22 on or along at least part of their top side 19, bottom side 20 and/or edge sides 21. It also appears from the Figure that both the first appliance 17 and the second appliance 18 include joining means 22 adapted to be joined with a transition device 1. The joining is effected by means of the joining means 11 on the transition device 1 and with the joining means 22 on the athletic appliances, where the joining means are complementary.

[0069] Figs. 7 to 14 show cross-sections of transition devices 1 in various embodiments, where the transition devices 1, however, all include an extension spring member 4 and a joining part 5, where the joining part 5 on:

[0070] Fig. 7 includes two flaps 6, each lying in a first plane 23 at each their side of the extension spring member 4, the flaps 6 including joining means 11 on the same side of the plane 23.

[0071] Fig. 8 includes four flaps 6, with two flaps 6 lying in a second plane 24 at each their side of the extension spring member 4 and two flaps 6 lying in a third plane 25 at each their side of the extension spring member 4, wherein the two planes 24 and 25 are parallel. The flaps 6 located in the second plane 24 include joining means 11 facing the third plane 25, whereas the flaps 6 located in the third plane 25 include joining means 11 facing away from the second plane 24.

[0072] Fig. 9 includes two flaps 6, both lying in a first plane 23 at each their side of the extension spring member 4, the flaps 6 including joining means 11 on either side of the plane 23.

[0073] Fig. 10 includes two flaps disposed at right angles to each other, one flap including joining means 11

at either side of the flap 6, whereas the other flap 6 includes joining means 11 at the side of the flap 6 facing away from the other flap 6.

[0074] Fig. 11 includes four flaps 6, with two flaps 6 located in a first plane 23 at each their side of the extension spring member 4 and two flaps 6 located in a second plane 24 and third plane 25, respectively, at the same side of the extension spring member 4 and at the same side of the plane 23, wherein the two planes 24 and 25 are parallel and perpendicular to the first plane 23. The flaps 6 located in the plane 23 include joining means 11 at the same side of the plane 23 and at the side of the plane 23 where the remaining two flaps 6 are located. The flap 6 located in the second plane 24 includes joining means 11 facing away from the third plane 25, whereas the flap 6 located in the third plane 25 includes joining means 11 facing away from the second plane 24.

[0075] Fig. 12 includes four flaps 6, with two flaps 6 located in a first plane 23 on each their side of the extension spring member 4 and two flaps 6 located in a second plane 24 and third plane 25, respectively, at the same side of the extension spring member 4 and at the same side of the plane 23, wherein the two planes 24 and 25 are parallel and perpendicular to the first plane 23. The flaps 6 located in the plane 23 include joining means 11 at the same side of the plane 23 and at the side of the plane 23 facing away from the flaps 6 located in the second plane 24 and the third plane 25. The flap 6 located in the second plane 24 includes joining means 11 facing away from the third plane 25, whereas the flap 6 located in the third plane 25 includes joining means 11 facing away from the second plane 24.

[0076] Fig. 13 includes four flaps 6, with two flaps 6 located in a second plane 24 at each their side of the extension spring member 4 and two flaps 6 located in a third plane 25 at each their side of the extension spring member 4, wherein the two planes 24 and 25 are parallel. The flaps 6 located in the second plane 24 include joining means 11 facing away from the third plane 25, whereas the flaps 6 located in the third plane 25 include joining means 11 facing away from the second plane 24.

[0077] Fig. 14 includes four flaps 6, with two flaps 6 located in a second plane 24 at each their side of the extension spring member 4 and two flaps 6 located in a third plane 25 at each their side of the extension spring member 4, wherein the two planes 24 and 25 are parallel. The flaps 6 located in the second plane 24 include joining means 11 facing the third plane 25, whereas the flaps 6 located in the third plane 25 include joining means 11 at either side of the plane 25.

[0078] Fig. 15 shows a transition device 11 in an embodiment with an extension spring member 4 including an inflatable chamber 26, wherein the inflatable chamber 26 is inflatable by means of a valve 27 mounted in connection with the chamber 26, where joining parts 5 in the form of flaps 6 are indicated as well.

[0079] Fig. 16 shows a transition device 11, but in an embodiment with an extension spring member 4, includ-

ing two inflatable chambers 26 and two valves 27 in perspective view, where also joining parts 5 in the form of flaps 6 are indicated. By using two coaxial chambers there may e.g. be a higher pressure in one inflatable chamber 26 than in the other. Another possibility is to use an inflatable chamber 26 which is divided into a number of contiguous channels disposed in axial direction of the chamber and/or in radial direction of the chamber.

Claims

1. A transition device with joining means for use in joining athletic appliances, **characterised in that** the transition device at least includes a length and a longitudinal direction, an extension spring member and a joining part with joining means, the joining part including at least two flaps, each flap including at least a first side, a second side, a first edge and a second edge, where at least the first edge of each flap is connected with the extension spring member and where at least the first side or second side of each flap includes joining means.
2. Transition device according to claim 1, **characterised in that** the extension spring member further includes at least one inflatable chamber and at least one valve.
3. Transition device according to any of claims 1 and 2, **characterised in that** the extension spring member further includes at least one foam element.
4. Transition device according to any of claims 1 and 2, **characterised in that** the extension spring member further includes at least one rubber band.
5. Transition device according to any of claims 1 and 2, **characterised in that** the extension spring member further includes at least one spring.
6. Transition device according to any of claims 1 to 5, **characterised in that** the first side and second side of the at least one flap of the joining part includes joining means.
7. Transition device according to any of claims 1 to 6, **characterised in that** the joining means on each flap include Velcro tapes, either with hooks only or with loops only.
8. Transition device according to any of claims 1 to 6, **characterised in that** the joining means on either side of a flap include Velcro tapes with hooks as well as loops.
9. An athletic appliance including at least one transition

device according to any of claims 1 to 8, the athletic appliance being the type typically used in connection with performing jumping, trampoline or tumbling, the athletic appliance including at least a first appliance and a second appliance, wherein at least one of the said appliances, e.g. an elastic mat or body, includes a top side, a bottom side and a number of edge sides, and further includes joining means on or along at least part of the top side, bottom side and/or edge sides of the appliance, **characterised in that** the first and the second appliance via the joining means are adapted for mutual joining by transition devices, wherein this joining is effected by complementary joining means arranged on respective appliances and transition devices that together constitute an athletic appliance.

10. A method for using a transition device according to any of claims 1 to 8 for joining athletic appliances of the type typically used in connection with performing jumping, trampoline or tumbling, wherein at least one athletic appliance, e.g. an elastic mat or body, includes a top side, a bottom side and a number of edge sides, and further includes joining means on or along at least part of the top side, bottom side and/or edge sides of the appliance, **characterised in that** the first and the second appliance via the joining means are adapted for mutual joining by transition devices, wherein this joining is effected by complementary joining means arranged on respective appliances and transition devices that together constitute an athletic appliance, and that the method at least includes the following steps:

- providing a first athletic appliance with joining means;
- providing a second athletic appliance with joining means;
- providing a transition device with joining means;
- providing and mounting at least one transition device with joining means including Velcro tape between the athletic appliances.

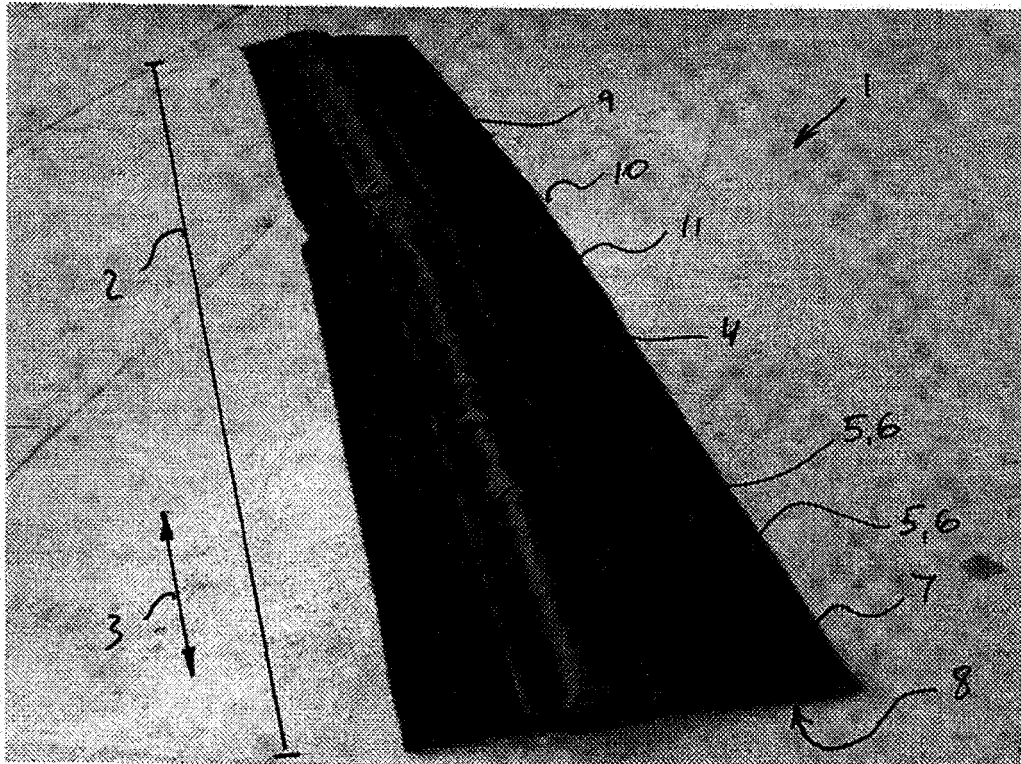


Fig 1

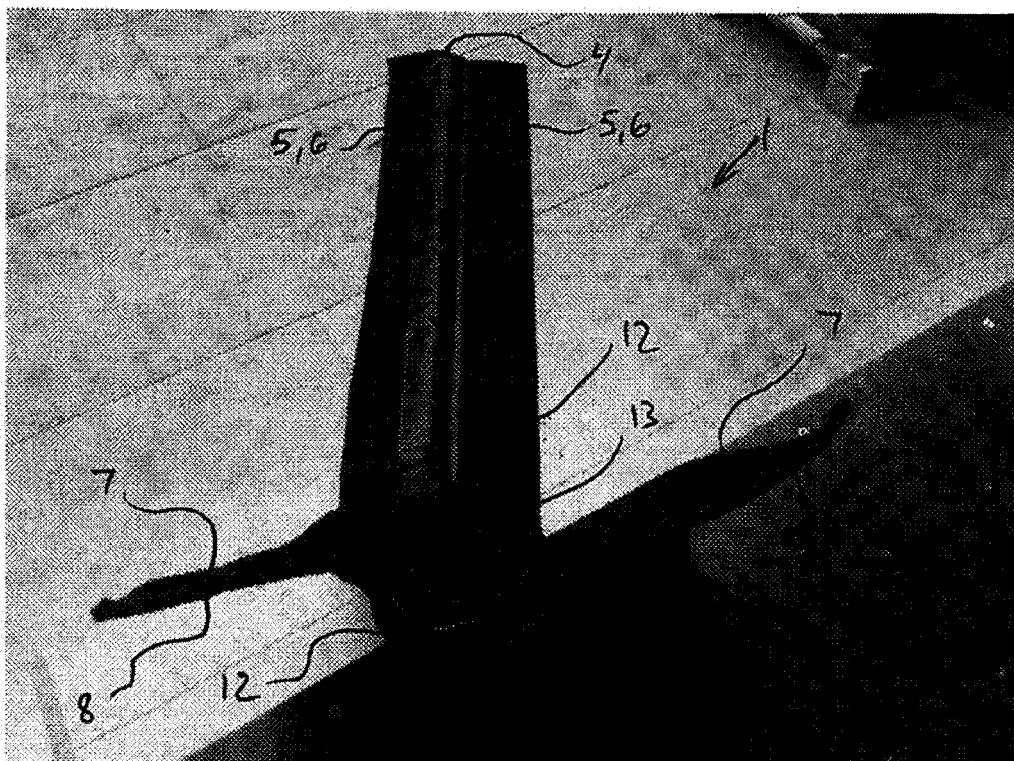


Fig 2

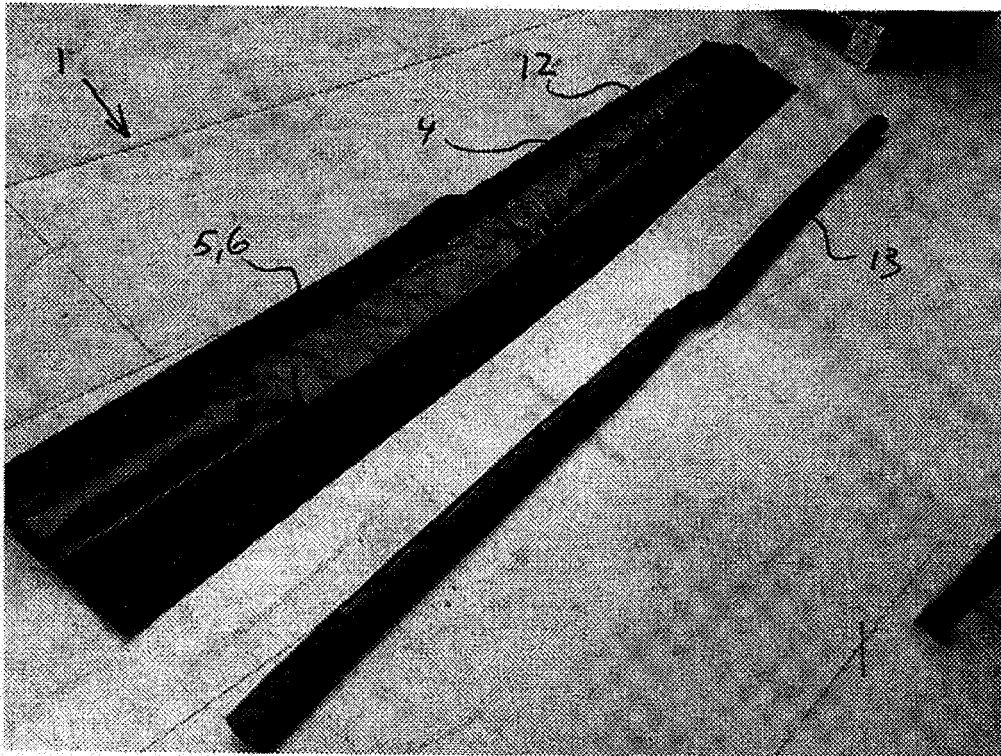


Fig 3

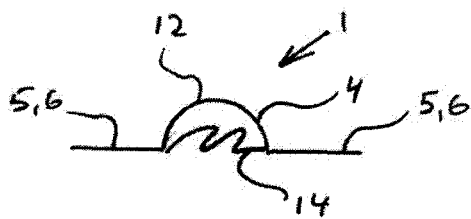


Fig 4

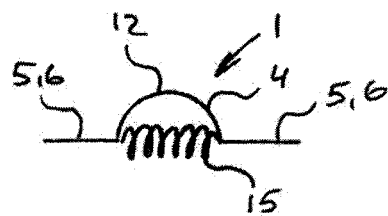


Fig 5

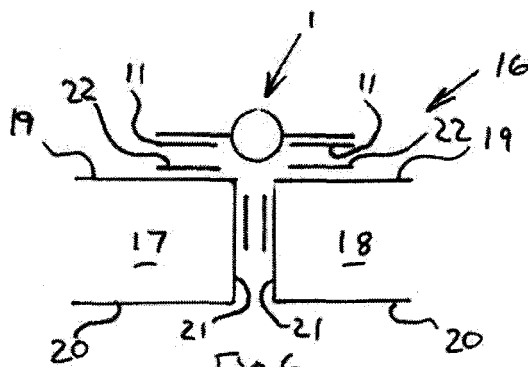


Fig 6

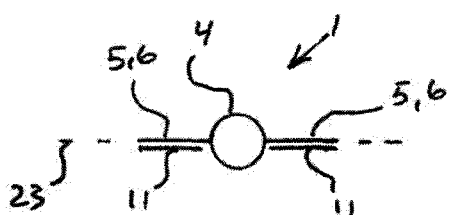


Fig 7

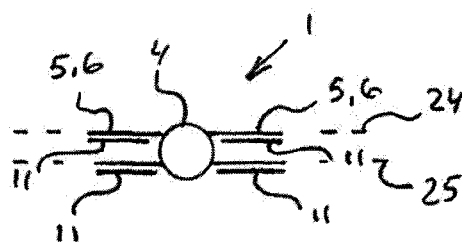


Fig 8

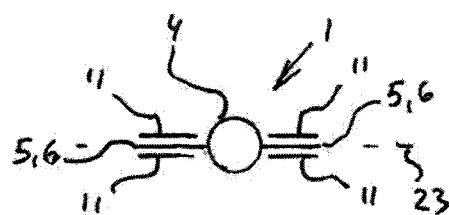


Fig 9

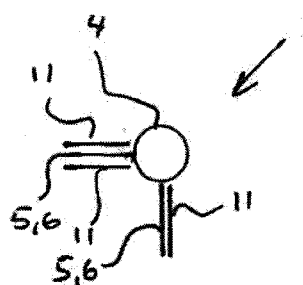


Fig 10

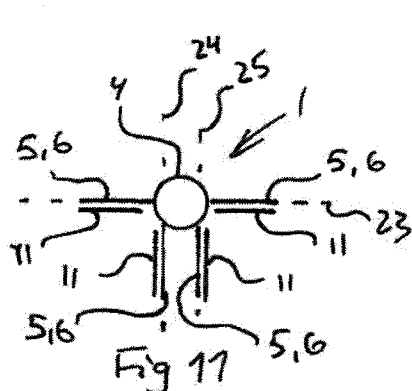


Fig 11

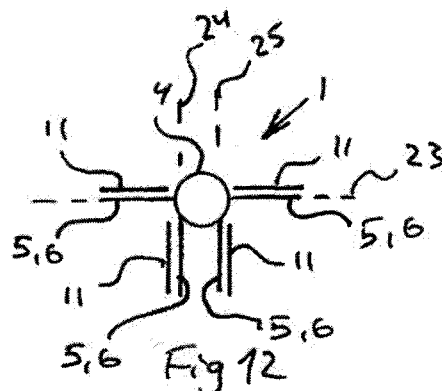


Fig 12

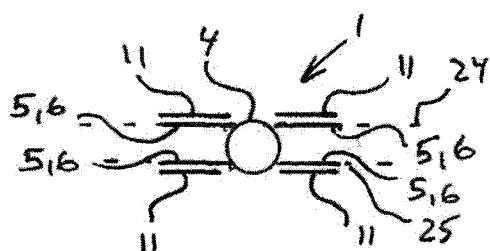


Fig 13

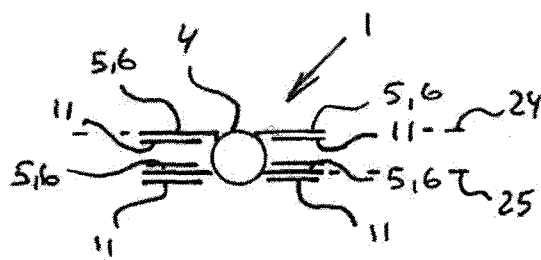
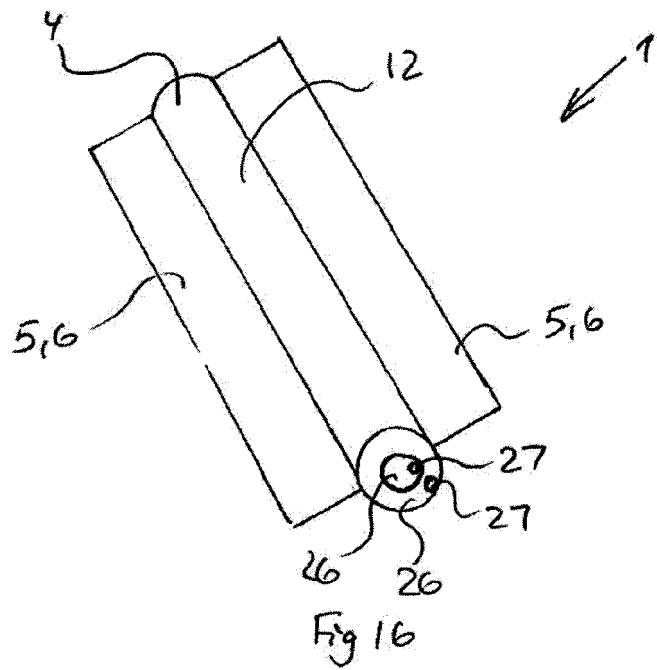
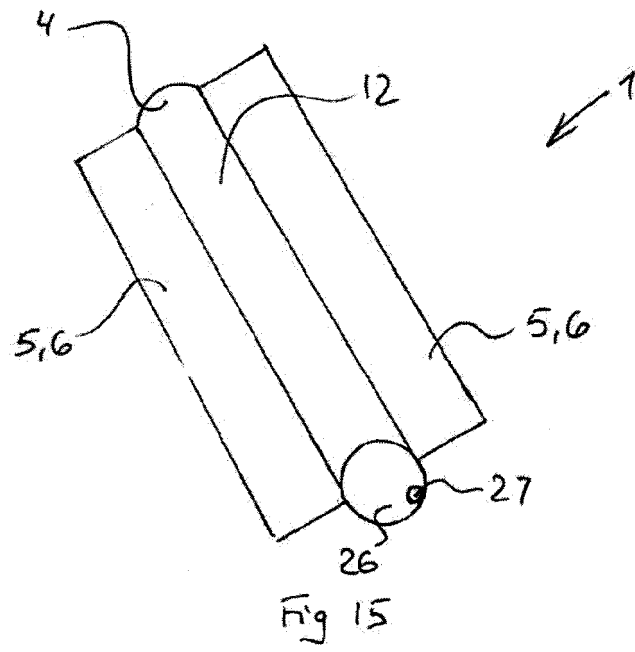


Fig 14





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Application Number
EP 16 16 6416

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Place of search Munich		Date of completion of the search 21 September 2016	Examiner Jekabsons, Armands
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			

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