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(54) Title: CONNECTING ELEMENT FOR CONNECTING TWO ADJACENT BOUNCE MATS IN COMPOSITE TRAMPOLINE BEDS

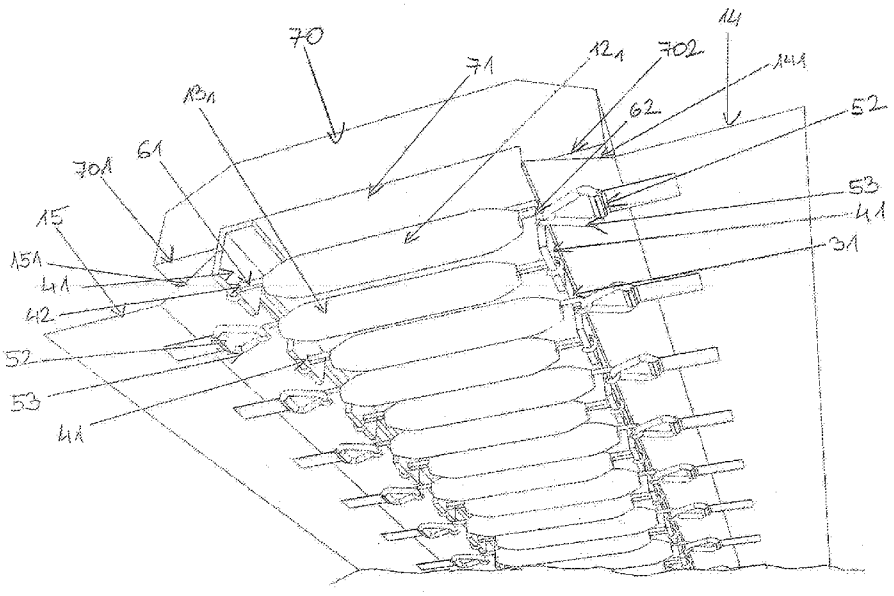

Fig. 1

(57) Abstract: The invention refers to a connecting element (10) which is a part of the trampoline frame and connects two adjacent bounce mats (14, 15) with elastic elements (12_1, 12_2,... 12_n and 13_1, 13_2,... 13_n) and a beam (11) when the trampoline is composed of multiple trampoline beds. The connecting element (10) includes a beam (11), elastic elements (12_1, 12_2,... 12_n) for connecting the first bounce mat (14) to the beam (11) and elastic elements (13_1, 13_2,... 13_n) for connecting the second bounce mat (15) to the beam (11), whereby the elastic elements (12_1, 12_2,... 12_n and 13_1, 13_2,... 13_n) are located beneath the beam (11) and the elastic elements (12_1, 12_2,... 12_n) that connect the first bounce mat (14) to the beam (11) and the elastic elements (13_1, 13_2,... 13_n) that connect the second bounce mat (15) to the opposite facing side of the beam (11) follow one another

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alternately crosswise and the elastic elements (12_1, 12_2,... 12_n and 13_1, 13_2,... 13_n) are of equal length. The beam (11) is formed with legs (23, 24) which face towards the surface of the respective bounce mat (14, 15) and the legs (23, 24) have cut-out sections (31) and full sections (41), whereby the full sections (41) are equipped with holes. On the edges of the individual bounce mat (14, 15) female fasteners (52) in the form of loops are attached for attaching the elastic elements (12_1, 12_2,... 12_n and 13_1, 13_2,... 13_n). The elastic elements (12_1, 12_2,... 12_n and 13_1, 13_2,... 13_n) are springs which have fastening means (61, 62) at both ends in the form of a hook. The connecting element can also include a safety pad (70) with a channel (71) that lies on the beam (11) and fits snugly along its entire length.

CONNECTING ELEMENT FOR CONNECTING TWO ADJACENT BOUNCE MATS IN COMPOSITE TRAMPOLINE BEDS

The invention refers to a connecting element which is a part of the trampoline frame and connects two adjacent bounce mats with elastic elements and beams when the trampoline is composed of multiple trampoline beds.

Individual trampolines are usually made with a single bed, which is composed of a bounce mat attached to the frame using various elastic elements such as elastic cords, bands and springs. The frame is usually set on legs so that the bounce mat is raised off the ground, thus allowing use of the trampoline. However, trampolines can be composed of several bounce mats, whereby the individual bounce mats are connected in such a way that several users can use the trampoline at once, with each user having their own trampoline bed.

In designs to date, two adjacent bounce mats have been connected via a connecting element which is part of the frame and which runs along the centre between the two bounce mats, which are connected to the connecting element along their entire length using elastic elements. The connecting element is designed as an elongated, preferentially tubular element and is made of metal, and can therefore withstand the required forces when the trampoline is used. The connecting element has evenly-spaced holes along both outside edges, i.e. the sides facing the bounce mats, which are connected. The individual bounce mats have evenly-spaced loops along the sides facing the connecting element, in the same distance as the spaces between the holes in the connecting element. The individual elastic elements, preferentially springs, usually have hooks at both ends, with one hook leading through a hole in the connecting element and the other hook leading through the corresponding loop on the bounce mat. The springs are thus attached at one end to the connecting element and at the other to the individual bounce mat. The springs are slightly stretched when connected, in order to ensure equal tension on the bounce mat and to prevent the springs from falling out of either the holes in the connecting element or the loops on the bounce mat. The distance between two adjacent bounce mats is therefore equal to at least two times the length of an attached spring, i.e. the length of the attached springs on the left and right sides and the width of the connecting element. The legs of the trampoline are connected to the bottom connecting element, i.e. the side facing the surface on which the trampoline is erected, in an established manner.

In order to protect the users of the trampoline, the surface between the two bounce mats, i.e. the attached springs on the left side of the connecting element, the connecting element and the attached springs on the right side of the connecting element, has to be protected. It is preferred that the connecting element be as narrow as possible, in order to minimise the surface area, but at the same time it must be sufficiently hard

and rigid to withstand the forces when the trampoline is used. The protection is usually executed in the form of a safety pad which is installed along the entire length, whereby the safety pad lies directly on the springs. The safety pad has no support, and falls through the springs if the user lands on it. The narrower the connecting element between the two bounce mats, the less stable the safety pad and therefore the less support it offers. This results in faster wear of the safety pad and increased likelihood of injury. Due to the described connection method, the connecting surface between the two bounce mats is wide, and thus the safety pad is also wider, and users who wish to jump from one bounce mat to the other must avoid landing on the safety pad.
All of the aforementioned deficiencies are resolved by the connecting element pursuant to the invention.

The invention will be described below and presented in diagrams and using design options.

Figure 1 shows the attachment of the elastic elements of two bounce mats to the connecting elements pursuant to the invention, bottom view;
Figure 2 shows the attachment of the elastic elements of two bounce mats to the connecting element pursuant to the invention, bottom view; elastic elements tensioned;
Figure 3 shows the attachment of the elastic elements of two bounce mats to the connecting element pursuant to the invention, front view.

Figures 1-3 show the attachment of the elastic elements of two bounce mats to the connecting element pursuant to the invention. The connecting element 10 for connecting two adjacent bounce mats 14, 15 is part of the trampoline frame and includes a beam 11 and elastic elements 12_1 and 12_2, ... 12_n for connecting the first bounce mat 14 to the beam 11 and elastic elements 13_1, 13_2, ... 13_n for connecting the second (adjacent) bounce mat 15 to the beam 11, whereby elastic elements 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n are located beneath the beam 11 and elastic elements 12_1, 12_2, ... 12_n that connect the first bounce mat 14 to the beam 11 and elastic elements 13_1, 13_2, ... 13_n that connect the second bounce mat 15 to the beam 11 follow one another alternately crosswise. This means that elastic elements 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n are attached alternately between the first bounce mat 14 and the opposite-facing side of the beam 11 and between the second bounce mat 15 and the opposite-facing side of the beam 11. The first elastic element 12_1 connects the first bounce mat 14 to the side of the beam 11 which faces the second bounce mat 15, and is followed by elastic element 13_1, which connects the second bounce mat 15 to the side of the beam 11 facing the first bounce mat 14, which is followed by elastic element 12_2, which connects the first bounce mat 14 to the side of the beam 11 facing the second bounce mat 15, which is followed by elastic element 13_2, which connects the second bounce mat 15 to the side of the beam 11 facing the first bounce mat 14, and so alternately along the entire length of the beam 11, i.e. along the entire edge of the first bounce mat 14 and

the second bounce mat 15. Elastic elements 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n are preferentially identical. In this manner, the same surface area taken up by the alternately crosswise attached elastic elements 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n is used to connect the two adjacent bounce mats 14 and 15, so that the connecting surface is significantly narrower than that found in the state of the art and is essentially defined by the width of the beam 11 or by the length of the individual attached elastic element 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n.

Beam 11 is designed as an elongated flat element with angular L-profiles 21, 22 fixedly attached along both its longer outside edges according to the known ways, whereby on each angular L-profile 21, 22 along its longer side, on a leg 23, 24 which is facing the respective bounce mat 14, 15, cut-out sections 31 spaced at the distance one from another are formed in such a way that each cut-out section 31 is followed by a full section 41 and the cut-out sections 31 and the full sections 41 alternate along the entire length of the respective leg 23, 24 of angular L-profile 21, 22. The width of the cut-out section 31 is always adjusted to the type of elastic element 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n used, in order to ensure the unrestricted movement of each elastic element 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n through the corresponding cut-out section 31. The cut-out sections 31 and the full sections 41, which are formed on legs 23, 24 of the angular L-profiles 21, 22 on both sides of the beam 11 are shifted, meaning that if one of the legs 23, 24 on the beam 11 begins with the full section41, the other of the legs 23, 24 on the beam 11 begins with the cut-out section 31. This enables the elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n to be attached in an alternating manner from the first bounce mat 14 and the second bounce mat 15 to the opposite-facing legs 23, 24 of the angular L-profiles 21, 22.

In one embodiment, a beam 11 can be formed as a single U-shaped element whose width defines the width of the beam 11, and both of its short legs which are facing the respective bounce mats 14, 15 have full sections 41 and cut-out sections 31 formed in the above-described manner.

The full sections 41 have preferably in their middle fasteners 42 for attaching elastic elements 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n to the beam 11. In a preferred embodiment the fastener 42 is a hole.

Each individual bounce mat 14, 15 has attached female fasteners 52 for attaching elastic elements 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n, whereby said female fasteners 52 are equally spaced one from another along the entire edge of the individual bounce mat 14, 15. The female fasteners 52 are attached to the edges at the same intervals and at the same positions as the cut-out sections 31 are formed on legs 23, 24 of the angular L-profiles 21, 22 and are preferably in the form of loops. This allows that after each individual elastic element 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n is with its one end attached into the loop of the bounce mat 14, 15 and is with

its other end attached into the hole of the opposite lying full section 41 formed on the leg 23, 24 of the angular L-profile 21, 22 on the beam 11, when the trampoline is used, and when the elastic element 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n stretches in its longitudinal direction it can move freely within the cut-out section 31. In one embodiment, the female fasteners 52 for attaching elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n are attached at a distance from the edge of the bounce mat 14, 15, thus a border section 141, 151 is formed which covers the contact between the bounce mat 14, 15 and the elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n and thus provides the user with additional protection against injury. In one embodiment, carabiners 53 are inserted into the loops on the bounce mats 14, 15 in order to make it easier to attach the individual elastic element 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n to the bounce mat 14, 15.

The elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n can be executed in a variety of known ways, such as elastic bands, elastic cords and springs. On one end, the elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n have fastening means 61 for attaching to the full section 41 on the leg 23, 24 of the beam 11, and on its other end the elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n have fastening means 62 for attaching to the respective bounce mat 14, 15. Fastening means 61, 62 can be executed in established variety of known ways, such as carabiners, rings, hooks. Preferably, the elastic elements 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n are identical and designed as springs with fastening means 61, 62 at both ends in the form of a hook.

Optionally, the connecting surface between the two bounce mats 14, 15 can be covered with safety pad 70. The safety pad 70 has on its bottom side, i.e. the side that lies on the beam 11, a channel 71, which is of the same dimensions as are the external dimensions of the beam 11, so that said safety pad 70 with the channel 71 lies on the beam 11 and fits snugly along its entire length. The safety pad 70 with its outside edges 701, 702 covers the border section 141, 151 of the bounce mats, thus providing additional protection of the contact between the respective bounce mats 14, 15 and the beam 11.

Embodiment

Two adjacent bounce mats 14, 15 are connected via a connecting element 10, which is part of the frame and which runs along the centre between the two bounce mats 14, 15. Connecting element 10 includes a beam 11 and springs 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n for connecting the first bounce mat 14 to the beam 11 and the adjacent bounce mat 15 to the beam 11, whereby springs 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n are attached so that they are located beneath the beam 11 and springs 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n follow one another alternately crosswise. Beam 11 has angular L-profiles 21, 22 fixedly attached along both its longer outside edges. On each leg 23, 24 of each individual angular L-profile 21, 22 which is facing the respective bounce

mat 14, 15, equally-spaced cut-out sections 31 are formed, such that the cut-out section 31 is followed by a full section 41, and the cut-out sections 31 and the full sections 41 alternate along the entire length of the respective leg 23, 24 of the respective angular L-profile 21, 22. The width of the cut-out section 31 is slightly wider than the width of spring 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n thus unrestricted movement of each of the springs 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n through the corresponding cut-out section 31 is enabled when the trampoline is in use The cut-out sections 31 and the full sections 41, which are formed on legs 23, 24 of the angular L-profiles 21, 22 on both sides of the beam 11 are shifted, meaning that leg 23 begins with a full section 41 and leg 24 begins with a cut-out section 31. This allows the springs 12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n to be attached in an alternating manner from the first bounce mat 14 and the second bounce mat 15 to the opposite-facing legs 23, 24 of the angular L-profile 21, 22. In the centre of the full sections 41 on legs 23, 24 fasteners 42 for springs 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n are formed in the form of holes. Each individual bounce mat 14, 15 has along its entire length at a distance from the edges attached female fasteners 52 for attaching elastic elements 12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n, in the form of loops into which carabiners 53 are inserted. The loops 52 are attached at the same intervals and at the same positions as the cut-out sections 31 on legs 23, 24 of the angular L-profiles 21, 22. Springs 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n have fastening means 61, 62 at both ends in the form of hooks. The first spring 12_1 is with a hook 62 on one end attached to the carabiner 53 inserted into the loop 52 on the bounce mat 14, and is with the hook 61 on the other end attached to the hole 42 in the full section 41 of the angular L-profile 23 on the beam 11, and in this way connects the first bounce mat 14 to the side of beam 11 which faces the second bounce mat 15. In the same manner, the second spring 13_1 connects the second bounce mat 15 to the side of beam 11 facing the first bounce mat 14, and so forth alternating along the entire length of the beam 11 i.e. along the entire length of the edges of the bounce mats 14, 15. In the described manner of attachment, springs 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n are located beneath the beam 11 and springs 12_1, 12_2, ... 12_n that connect the first bounce mat 14 to the beam 11 and springs 13_1, 13_2, ... 13_n that connect the second bounce mat 15 to the beam 11 follow one another alternately crosswise. Thus, the same surface area taken up by the springs 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n is used to connect the two adjacent bounce mats 14 and 15, so that the connecting surface is significantly narrower than that found in the state of the art and is defined by the width of the beam 11 or by the length of the individual attached spring 12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n. The connecting surface between the two bounce mats 14, 15 is covered with a safety pad 70. The safety pad 70 has on its bottom side, i.e. the side that lies on beam 11, a channel 71, which is of the same dimensions as are the external dimensions of beam 11, so that the underside of the safety pad 70 lies on the beam 11 and fits snugly along its entire length. The safety pad 70 with its outside edges 701, 702 covers the border section 141, 151 of the bounce mats 14, 15, thus providing additional protection of the contact between the respective bounce mat 14, 15 and the beam 11.

The advantage of the connecting element according to the invention is the significantly narrower connecting surface between the two bounce mats. This also makes the safety pad narrower and gives it good support, as it lies on the beam and is pressed snugly onto it. Since the safety pad does not lie on the springs but on the beam, and since the springs are hidden under the beam, the lifetime of the safety pad is extended. Since the safety pad lies on and fits snugly on the beam, the possibility of movement of the safety pad during the use of the trampoline is reduced, which increases the user safety. Since the connecting surface between the adjacent bounce mats is narrower, it is easier for the user to jump from one mat onto the other. This proposed solution also increases the bouncing surface of the trampoline facility, on average by around 11 percent, which means increased capacity and increased cost-effectiveness. The proposed solution can be used in all cases where several trampoline beds are intended to be installed together.

Patent claims

1. A connecting element (10) for connecting two adjacent bounce mats (14, 15) in composite trampoline beds, whereby the bounce mats (14, 15) are connected to each other via a connecting element (10) which is a part of a frame of the trampoline with legs attached to the lower part of the frame, characterised in that the connecting element (10) includes a beam (11) and elastic elements (12_1, 12_2, ... 12_n) for connecting the first bounce mat (14) to the beam (11) and the elastic elements (13_1, 13_2, ... 13_n) for connecting the second bounce mat (15) to the beam (11), whereby the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) are located beneath the beam (11) and the elastic elements (12_1, 12_2, ... 12_n) that connect the first bounce mat (14) to the opposite facing side of the beam (11) and the elastic elements (13_1, 13_2, ... 13_n) that connect the second bounce mat (15) to the opposite facing side of the beam (11) follow one another alternately crosswise and the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) are of equal length.

2. The connecting element according to claim 1, characterised in that the beam (11) is designed as an elongated flat element with angular L-profiles (21, 22) fixedly attached along both its longer outside edges, whereby on each angular L-profile (21, 22) along its longer side, on a leg (23, 24) which is facing the respective bounce mat (14, 15), cut-out sections (31) spaced at the distance one from another are formed such that each cut-out section (31) is followed by a full section (41) and the cut-out sections (31) and the full sections (41) alternate along the entire length of the respective leg (23, 24) of said angular L-profile (21, 22), whereby the width of the cut-out section (31) is adjusted to the type of elastic element (12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n) used, in order to ensure the unrestricted movement of each elastic element (12_1, 12_2, ... 12_n and 13_1, 13_2, ... 13_n) through the corresponding cut-out section (31).

3. The connecting element according to claim 2, characterised in that the cut-out sections (31) and cut-out sections (41), which are formed on the legs (23, 24) of the angular L-profiles (21, 22) on both sides of the beam (11) are shifted, meaning that if one of the legs (23, 24) on the beam (11) begins with the full section (41), the other of the legs (23, 24) on the beam (11) begins with the cut-out section (31).

4. The connecting element according to claims 2 and 3, characterised in that the beam (11) is formed as a single U-shaped element, and the cut-out sections (31) and the full sections (41) are formed on both of its short legs facing the respective bounce mats (14, 15), whereby the cut-out sections (31) and the full sections (41) are shifted.

5. The connecting element according to claims 2 to 4, characterised in that the full sections (41) have in their middle fasteners (42) for attaching the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) to the beam (11).

6. The connecting element according to claim 1, characterised in that each individual bounce mat (14, 15) has along its edges attached female fasteners (52) for attaching the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) which are equally spaced one from another along the entire edge of the bounce mat (14, 15), whereby the female fasteners (52) are attached at the same intervals and at the same positions as the cut-out sections (31) are formed on the legs (23, 24) of the angular L-profiles (21, 22).

7. The connecting element according to claim 6, characterised in that the female fasteners (52) for attaching the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) to the bounce mats (14, 15) are attached at a distance from the edge of the bounce mat (14, 15) thus a border section (141, 151) of the bounce mat (14, 15) covers the contact between the bounce mat (14, 15) and the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n).

8. The connecting element according to claim 1, characterised in that the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) have on one end, fastening means (61) for attaching to the full section (41) on the leg (23, 24) of the beam (11), and on its other end the elastic elements (12_1, 12_2, ... 12_n, 13_1, 13_2, ... 13_n) have fastening means (62) for attaching to the respective bounce mat (14, 15).

9. The connecting element according to previous claims, characterised in that the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) are springs which have fastening means (61, 62) at both ends in the form of hooks, the female fasteners (52) for attaching the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) to the bounce mats (14, 15) are in the form of a loop and the fasteners (42) for attaching the elastic elements (12_1, 12_2, ... 12_n,13_1, 13_2, ... 13_n) to the beam (11) are in the form of a hole.

10. The connecting element according to previous claims, characterised in that carabiners (53) are inserted into the loops attached on the bounce mat (14, 15).

11. The connecting element according to previous claims, characterised in that it additionally includes a safety pad (70) which has on its bottom side, i.e. the side that lies on the beam (11), a channel (71), which is of the same dimensions as are the external dimensions of the beam (11), so that the safety pad (70) with the channel (71) lies on the beam (11) and fits snugly along its entire length, and the safety pad (70) with its outside edges 701, 702 covers the border section 141, 151 of the bounce

mats (14, 15).

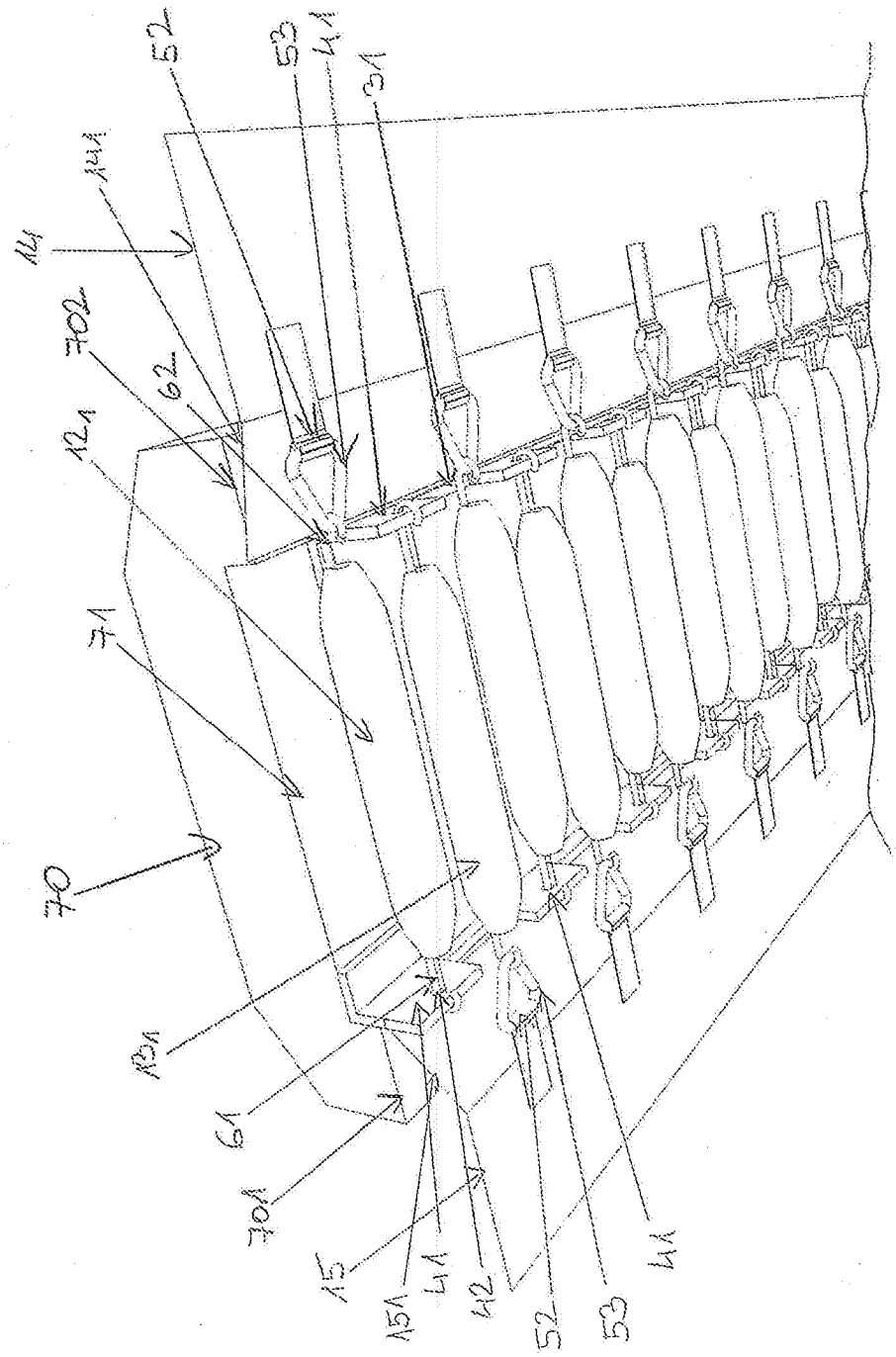

Fig. 1

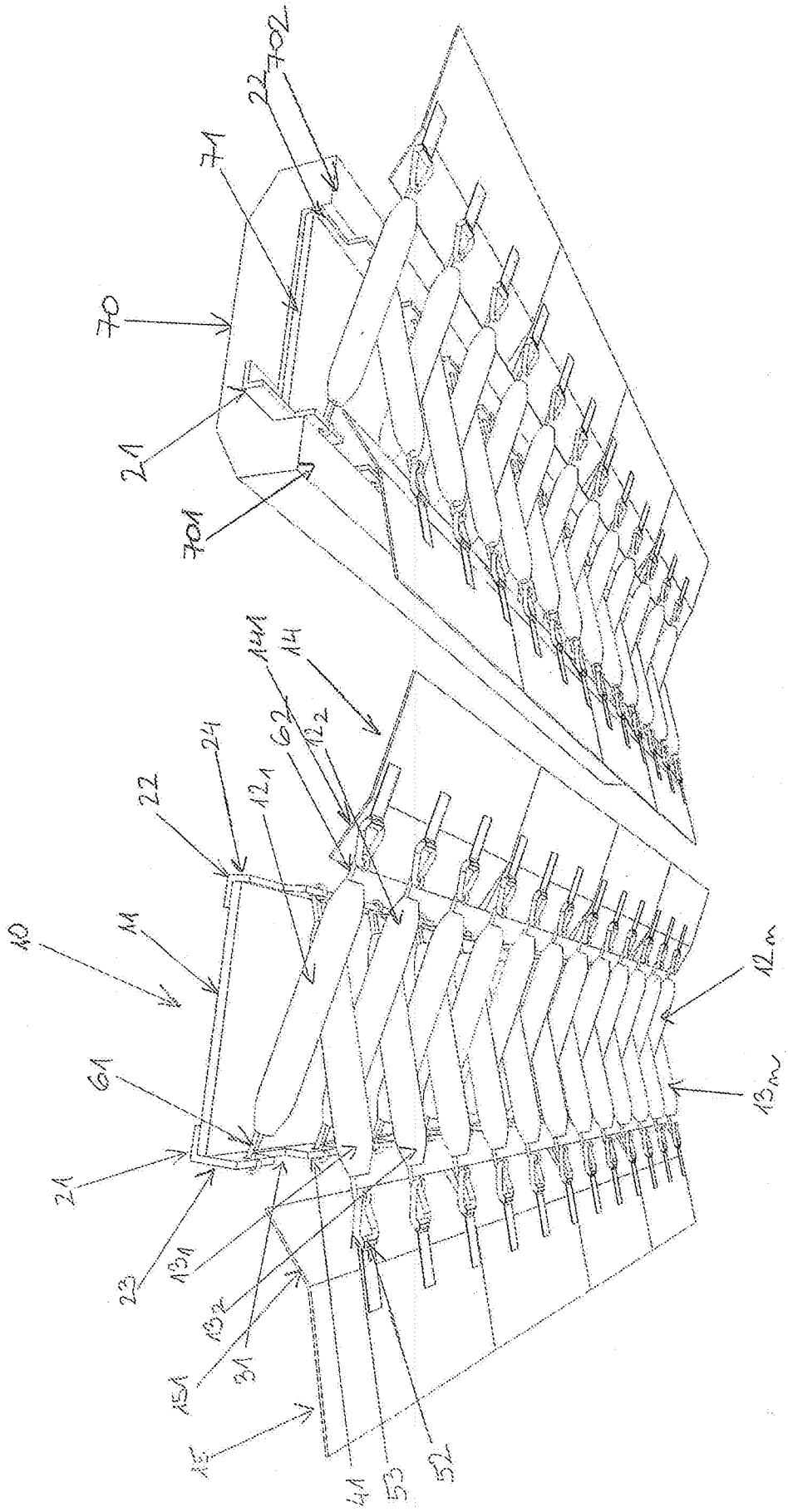
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Fig. 2

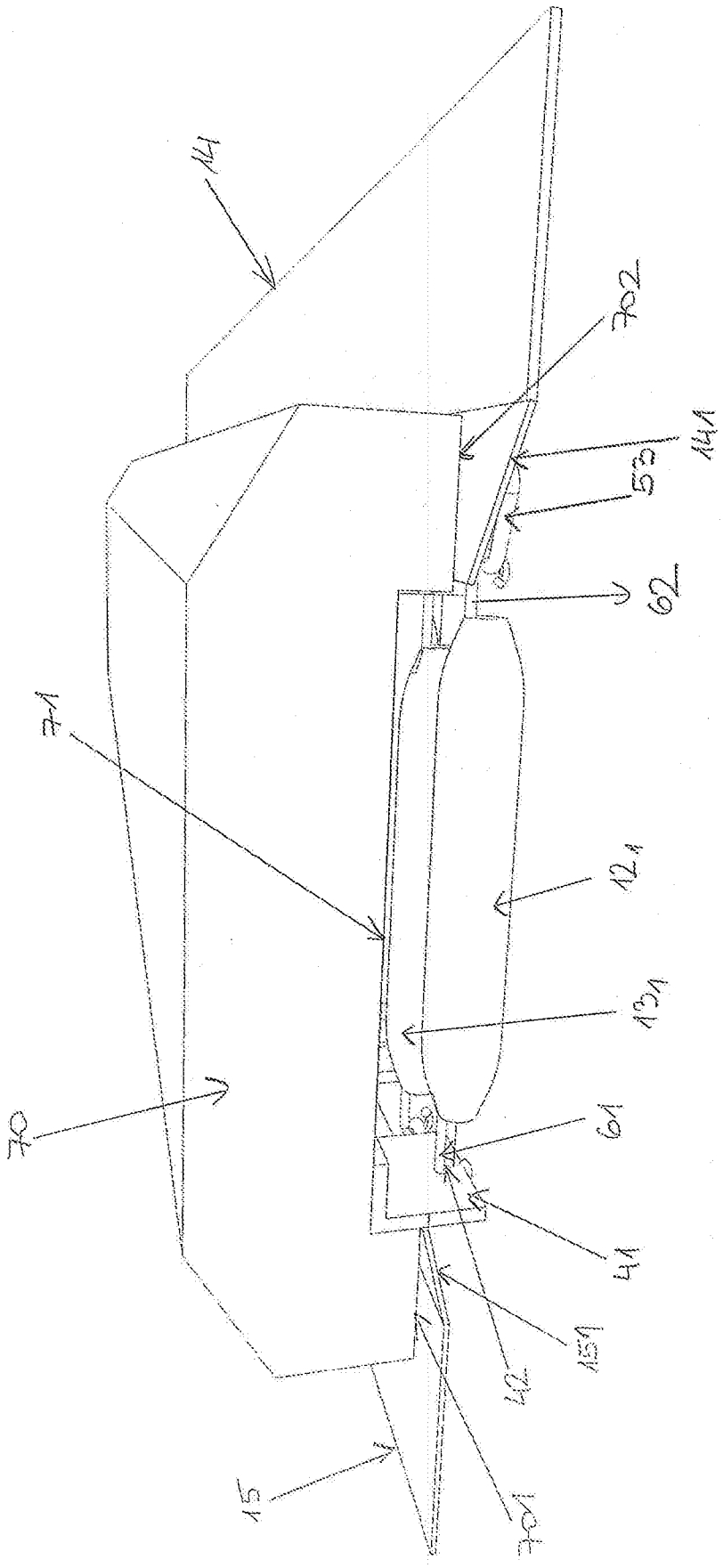

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/SI2018/050005

A. CLASSIFICATION OF SUBJECT MATTER
INV. A63B5/11 A63B71/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 2016 100064 U1 (CROMM PETER [DE]) 27 January 2016 (2016-01-27) paragraph [0019] paragraph [0040]; figures	1-11
A	US 2011/287899 A1 (WEST KARL J [US]) 24 November 2011 (2011-11-24) figure 3	1
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

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