

(19)



(11)

EP 2 933 004 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

21.10.2015 Bulletin 2015/43

(51) Int Cl.:

A63B 9/00 (2006.01)

A63G 31/14 (2006.01)

A63G 31/00 (2006.01)

A63H 33/00 (2006.01)

E04F 11/02 (2006.01)

A63B 71/02 (2006.01)

(21) Application number: **15447007.4**

(22) Date of filing: **10.04.2015**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

Designated Validation States:

MA

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(30) Priority: **17.04.2014 BE 201400269**

(54) CLIMBING STRUCTURE TO BE USED IN A PLAYGROUND

(57) A climbing structure to be used in a playground for children comprising at least three subunits whereof at least one subunit being a climbing subunit. The climbing subunit comprises a pillar with an upper and a lower part, and platforms with holes along at least a part of the platform edge. The upper part of the pillar comprises a first set of fastening means to fasten a series of ropes, the lower part comprises a second set of fastening means

to fasten a series of ropes, and the series of ropes run through the holes of the platforms from the first set of fastening means to the second set of fastening means. The subunits are connected to at least one other subunit. Thus, the climbing structure has a relatively simple structure which facilitates the manufacturing and installation process.

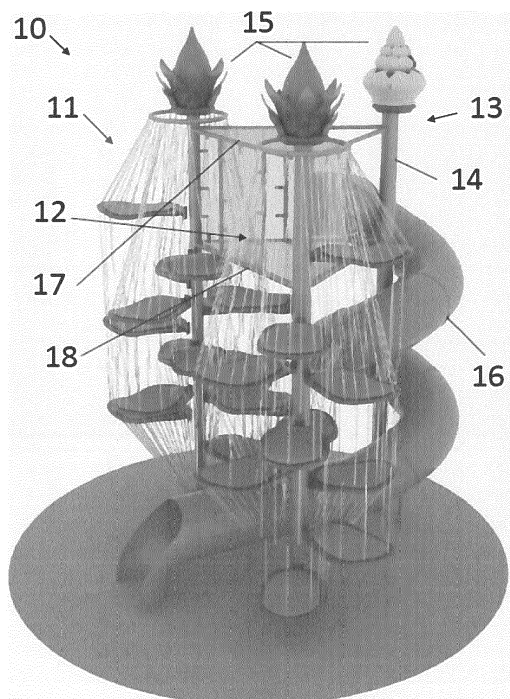


FIG. 1

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Description

[0001] The present invention relates to a climbing structure and more particularly, to a climbing structure that can be used in indoor and outdoor playgrounds

[0002] Climbing structures are used as leisure facilities in both indoor and outdoor playgrounds for children. Children are stimulated to use their own force in order to climb from one position to another. Their force is needed if they want to move in the gravitational field of the Earth. Climbing promotes human's strength, agility, concentration, self-control, as well as its balance and coordination capacities. Different climbing structures are known in accordance with the prior art, e.g. climbing walls as described in US 7,056,266, and climbing nets as described in DE19914192. Nets guarantee the safety of children when they fall. Other types of climbing structures known in the state of the art, e.g. DE10161966, disclosing the combination of platforms attached to a supporting grid or mesh like structure. The platforms have several access points. The later means offer children the opportunity to move from one surface to another. The use of grid structures at the outer edge of the aforementioned background art guarantees the safety of the children, i.e. the grid can prevent that children fall from the climbing structure. The large variety of shapes of the individual platforms, the orientation of the individual platforms, and the shape of the gridded surfaces are responsible for a large variety of climbing structures. A disadvantage of these climbing structures is the rather complex integration of each unit within the climbing structure whereby the manufacturing and installation processes of these climbing structures are complicated and time-consuming.

[0003] Therefore, the objective of the present invention is to provide a climbing structure, consisting of individual platforms, pillars and ropes, attached to each other in a relatively simple configuration, which streamlines the process of manufacturing and installation.

[0004] In accordance with the present invention, there is provided a climbing structure to be used in a playground for children comprising at least three subunits whereof at least one subunit being a climbing subunit, the climbing subunit comprises a pillar with an upper part and a lower part, and several platforms with holes, and a series of ropes characterized in that the upper part comprises a first set of fastening means to fasten the series of ropes, the lower part comprises a second set of fastening means to fasten the series of ropes, the platforms comprising holes along at least a part of the platform edge, the series of ropes of the climbing subunit is attached to the first set of fastening means and to the second set of fastening means of the same climbing subunit and run through the holes of the platforms of the same climbing subunit to connect the first set of fastening means with the second set of fastening means, and the subunits are connected with at least one other subunit.

[0005] This allows to obtain such a climbing structure with a relatively simple structure which facilitates the

manufacturing and installation process. Indeed, the climbing subunits can be manufactured independently of each other.

[0006] A preferred embodiment of the present invention comprises at least two subunits being climbing subunits.

[0007] According to a preferred embodiment of the present invention, the first set of fastening means comprises a frame, in particular a round-shaped object, connected to the upper part of the pillar by means of a series of connectors, in particular rods.

[0008] Using such a frame, in particular a round-shaped object to fasten the series of ropes instead of attaching the series of ropes directly to the pillar, creates more space to stand on the platforms and to move from one platform to another, especially for the highest platforms. Moreover, in comparison with a polygon-shaped object, the use of a round-shape object better distributes the pulling forces of the series of ropes over the object and guarantees a better stability of the climbing structure.

[0009] According to a preferred embodiment of the present invention, the climbing structure is characterized in that the series of ropes comprising a first set of ropes and a second set of ropes, whereby the first set of ropes comprises structural ropes and the second set of ropes are interconnected to form a net.

[0010] Using such a first set of structural ropes offers added stability to the platforms. Besides others, the first set of ropes supports the weight of the platforms in addition to the weight of the children. The second set of ropes prevents that children could fall from the platforms and guarantees the safety of the children when using the climbing structure.

[0011] A preferred embodiment of the climbing structure is characterized in that the climbing structure comprises an anchoring unit which comprises at least three sub-anchoring units of which at least one sub-anchoring unit being a climbing sub-anchoring unit, whereby aforesaid climbing sub-anchoring comprises a tube and supporting means.

[0012] Using such anchoring units facilitates the installation process since the sub-anchoring units could be anchored to the soil independently of each other, following the anchoring of the subunits using the sub-anchoring units. In order to guarantee the stability of the climbing structure, the subunits are connected with at least one other subunit.

[0013] Another aspect of the present invention, according to a preferred embodiment of the climbing structure, comprises at least two sub-anchoring units being climbing sub-anchoring units.

[0014] A preferred embodiment of the present invention discloses that only a portion of less than 25% of the platforms side surface is connected to the pillar of the same climbing subunit by means of platform fixation means.

[0015] Advantageously, this configuration reduces the pulling force of a platform on the pillar in comparison with

platforms for which the side surface is entirely in contact with the pillar since a portion of the weight caused by the mass of the platform and the mass of children on that platform is supported by the series of ropes.

[0016] Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

[0017] In the drawings:

Fig. 1 depicts a climbing structure in accordance with a first embodiment of the invention

Fig. 2 is a side-view illustration of a climbing subunit in accordance with a preferred embodiment of the current invention

Fig. 3 is a plan side-view of a platform of the climbing structure in accordance with a preferred embodiment of the present invention

Fig. 4 is a plan top-view of a platform of the climbing structure in accordance with the present invention

Fig. 5 illustrates an embodiment of the first set of ropes and of the second set of ropes of the climbing structure in accordance with the present invention

Fig. 6 depicts an embodiment of an anchoring unit in accordance with the present invention

[0018] Referring to Fig. 1, a climbing structure **10** in accordance with a preferred embodiment of the present invention comprises three subunits **11**, **12** and **13**. If (imaginary) straight horizontal connection lines could be drawn in between the pillars of these subunits, the connection lines would form a triangle. This configuration is not the only possible configuration of the subunits, e.g. the (imaginary) straight connection lines between the pillars of the subunits could also form a line segment. Moreover, the climbing structure may comprise more than one subunit. In that case, the (imaginary) straight connection lines between the pillars of the subunits could form a segment, a triangle or a polygon.

[0019] The preferred embodiment of the climbing structure comprises two subunits being climbing subunits. These climbing subunits are indicated as **11** and **12** in Fig. 1. Other climbing structures comprising three subunits, whereof one subunit being a climbing subunit, can also be covered by the present invention. Moreover, according to the present invention, the climbing structure can comprise more than one subunit whereof at least one subunit being a climbing subunit.

[0020] Fig. 2 depicts a climbing subunit **11** in accordance with a preferred embodiment of the present invention. The climbing subunit comprises a pillar **20**. This pillar is a cylinder of height h . The pillar is preferably made of steel. However, the shape and construction material of

the pillar are not restricted to aforementioned shape and construction material. For example, the pillar can be made of synthetic or natural organic fibres. Furthermore, the pillar comprises a lower part **21** and an upper part **22**. The lower part of the pillar is considered as the part of the pillar starting at height 0, i.e. the base of the pillar, up to a height h/n . The upper part of the pillar is considered as the part starting at height $h(1-1/n)$ up to height h , i.e. the top of the pillar. In this description is n a reel number larger or equal to 2. Preferably, n equals 4.

[0021] Furthermore, the climbing subunit comprises several platforms **23**. The several platforms are preferably attached on different heights to the pillar. Fig. 3 illustrates a plan side-view of a platform **23** in accordance with a preferred embodiment of the present invention. The platform is attached to the pillar **20** of a climbing subunit using (third) fastening or fixation means **30**. These fixation means are, by example without restrictions to the objective, platforms fixation means welded to the pillar. For example, the fixation means can be U-shaped fixation means. Furthermore, these platform fixation means have holes allowing the platform to be attached to the pillar by means of bolts. The lower surface **31** and the upper surface **32** of the platform are wavy. Fig. 4 depicts a top view of a platform **23** in accordance with a preferred embodiment of the present invention. The top view of platform **23** demonstrates the elliptical-shaped contour **40** of the platform, like the contour of the lower surface (not illustrated). The platform is preferably manufactured from laminated wood. The shape and material of the platform are not restricted to aforementioned shape and material. For example, the platform can also be made of synthetic fibres. The platform comprises several holes **41** for at least along a part of its edge, as illustrated in Fig. 4. These holes are circular and have diameters which are larger than the diameters of the ropes (these ropes can also be wire ropes) of the climbing structure. However, the shape of the holes is not restricted to aforementioned shape. The entire edge of the platform comprises preferably several holes whereby the distance between consecutive holes is fixed. Other embodiments of the platform can have a variable distances between consecutive holes. It is not required that the several platforms of the climbing structure are equally shaped. The platforms can be different in terms of shape, dimensions, material and configuration of the holes.

[0022] The climbing subunit comprises a series of ropes **24**, as illustrated in Fig. 2. The upper part of the pillar comprises a first set of fastening means **25** to fasten the series of ropes. These fastening means comprises a frame, in particular a round-shaped object, preferably a steel ring, to which the series of ropes are attached. The lower part of the pillar comprises second set of fastening means **26** to attach the series of ropes. These fastening means comprises a frame, in particular a round-shaped object, preferably a second steel ring, to which the series of ropes is attached. The series of ropes is attached to the first set of fastening means of the climbing subunit

and to the second set of fastening means of the same climbing subunit, and the series of ropes runs through the holes in the platforms of the same climbing subunit from the first set of fastening means towards to the second set of fastening means. It is not required that the series of ropes runs through the holes of every climbing subunit.

[0023] A preferred embodiment of the present invention discloses a first series of ropes **50** and a second series of ropes **51**, as shown in Fig. 5. The ropes of the first series of ropes are structural ropes. However, it is possible that platforms having the same position (i.e. platforms positioned on top of each other) are sharing the same structural ropes. Supporting means are attached to the structural ropes to support the platforms. These supporting means can be any means located preferably below and near each hole of the platform through which structural ropes run. Therefore, part of the platform can slightly move with respect to its initial position. Using this configuration, the weight of the platforms and the weight of the children is also captured by the structural ropes. Hence, the structural ropes provide stabilization of the platforms, together with the fixation of the platforms to the pillars. The structural ropes are preferably made of stainless steel. However, the structural ropes can also be manufactured of other material like synthetic or natural organic fibres, or metal wires, provided that the structural ropes are strong enough to support the weight of the platforms and the weight of the children. The ropes of the second series of ropes are net ropes, i.e. ropes to form a net. A net will be formed by knotting the net ropes as illustrated in Fig. 5. This net prevents that children in the climbing structure will fall from a platform and it guarantees in this way the safety of the children in the climbing structure. The second series of ropes comprises typically a number of net ropes that is sufficient according the EN 1176 Standard conform fall protection. The net ropes are preferably made of stainless steel. However, the net ropes can also be manufactured of other materials, like synthetic or natural organic fibres, provided that they are strong enough to guarantee the fall protection.

[0024] In case the climbing structure in accordance to present invention comprises more than one climbing subunit, the invention is in no way limited to a climbing structure with identical climbing subunits. For example, the climbing subunits can differ in terms of shape, dimensions and the material of the pillars, the platforms and the ropes.

[0025] The subunit **13** which is not a climbing subunit comprises a pillar **14**. This pillar is a cylinder of height h' that is by preference equal to the height h of the pillars of the climbing subunit. The pillar of subunit 13 is preferably made of steel. However, the shape and the material of the pillar are not restricted to aforementioned shape and material.

[0026] In case the climbing structure in accordance to a preferred embodiment of the present invention comprises more than one subunit which is not a climbing sub-

unit, the invention is in no way limited to a climbing structure with identical subunits that are not climbing subunits. For example, these subunits can differ in terms of shape, dimensions and the material of the pillars, the platforms and the ropes.

[0027] As an option, the subunits can comprise decorative elements. As illustrated in Fig.1, decorative elements **15** are added to the top portion of the pillars of the subunits. In addition, recreational means like a slide **16** can be added to the climbing structure.

[0028] The subunits are connected with at least one other subunit. The connections are needed to guarantee the stability of the climbing structure. The subunits in accordance with a preferred embodiment of the present invention are connected by means of two tubes **17** and **18**. These tubes are attached to the pillars of the subunits. The tubes are cylinders with a length that equals the distance between the pillars of the subunits. The tubes are preferably made of steel. The shape, the dimensions and the material of the tubes are not restricted to the aforementioned shape, dimensions and material. Besides, other types of connections can be used in other embodiments to connect the subunits with at least one other subunit.

[0029] Fig. 6 depicts an anchoring unit **60** of the climbing structure in accordance with a preferred embodiment of the present invention. The anchoring unit comprises three sub-anchoring units **61**, **62** and **63**. The configuration of the sub-anchoring units is preferably equal to the configuration of the subunits. Moreover, the number of sub-anchoring units preferably equals the number of subunits.

[0030] In accordance with a preferred embodiment of the anchoring units of the climbing structure, two sub-anchoring units being climbing sub-anchoring units. These climbing sub-anchoring units are indicated as **61** and **62** in Fig. 6. The number of climbing sub-anchoring units preferably equals the number of climbing subunits.

[0031] The climbing sub-anchoring unit comprises a tube **64**. This tube is a cylinder preferably made of steel. However, the shape and material of the tube are not restricted to aforementioned shape and material. The properties of the tube are strongly dependent on the properties of the climbing subunit. This said, the diameter of the tube of the climbing sub-anchoring units has to be larger, in accordance with the preferred embodiment, than the diameter of the pillar of the climbing subunit. I.e., the pillar is shifted into the tube. The tube itself is attached to the ground.

[0032] The climbing sub-anchoring unit comprises supporting means **65**. These supporting means are preferably three round rods **66**, **67**, **68**, slanting mounded to the tube attached to the ground. These rods are preferably made of steel. Aforementioned rods are not required to be identical. E.g., the rods can differ in length. The type and number of supporting means, as well as the shape and the material are not limited to aforementioned type, number, shape and material. The characteristics of

the supporting means do largely depend on the characteristics of the climbing subunits, as well as on the characteristics of the ground.

[0033] In case that an anchoring unit in accordance with the present invention comprises more than one climbing sub-anchoring unit, is the invention not limited to anchoring units with identical climbing sub-anchoring units. The climbing sub-anchoring units can for example differ in terms of shape, dimensions and material of the tubes and supporting means.

[0034] The sub-anchoring unit **63**, which is not a climbing sub-anchoring unit, comprises a tube **69**. This tube is a cylinder which is preferably made of steel. The shape and material of the tube are not restricted to the aforementioned shape and aforementioned material. For example, the tube can also be made of synthetic or natural fibres. The characteristics of the tube depend largely on the characteristics of the subunits which are not climbing subunits. This said, the diameter of the tube of the sub-anchoring unit **63** has to be larger, in accordance with the preferred embodiment, than the diameter of the pillar of the subunit which is not a climbing subunit. The pillar is shifted into the tube. The tube itself is attached to the ground.

[0035] In case that an anchoring unit in accordance with the present invention comprises more than one sub-anchoring unit which is not a climbing sub-anchoring unit, the invention is not limited to anchoring units with identical sub-anchoring units being none climbing sub-anchoring units. The sub-anchoring units can for example differ in terms of shape, dimensions and material of the tubes and supporting means.

[0036] Each platform comprises a platform side surface **70**. A portion of less than 25% of this platform side surface is connected to the pillar of the same climbing subunit by means of platform fixation means **30**. Additionally, a platform is also connected to a pillar of a climbing unit by means of series of ropes, i.e. series of ropes run through the holes in the platform from the first set of fastening means to the second set of fastening means. The first and second set of fastening means are attached to the pillar of the same climbing subunit. Hence, part of the platform is attached to the pillar by means of series of ropes.

[0037] The climbing structure in accordance to the present invention is relatively simple to construct, simplifying the installation and manufacturing process. The subunits of the climbing structure can be manufactured and installed independently of each other. Therefore, the climbing structure in accordance with present invention is suitable to be installed on uneven grounds, e.g. grounds with steps. The sub-anchoring units can namely be anchored independently of each other to the steps in a relatively simple way. The pillars of the subunits which are manufactured independently of each other, can be slide into the tubes of the sub-anchoring units. Finally, in order to guarantee the stability of climbing structure, the subunits are connected with at least one other subunit.

Claims

1. A climbing structure (**10**) to be used in a playground for children comprising at least three subunits (**11**, **12**, **13**) whereof at least one said subunit being a climbing subunit (**11**), said climbing subunit comprises a pillar (**20**) with an upper part (**22**) and a lower part (**24**), and several platforms (**23**) with holes (**41**), and a series of ropes (**24**) **characterized in that** said upper part comprises a first set of fastening means (**25**) to fasten said series of ropes, said lower part comprises a second set of fastening means (**26**) to fasten said series of ropes, said platforms comprising said holes along at least a part of the platform edge, said series of ropes of said climbing subunit is attached to said first set of fastening means and to the said second set of fastening means of the same said climbing subunit and run through said holes of the said platforms of the same said climbing subunit to connect said first set of fastening means with said second set of fastening means, and said subunits are connected with at least one other said subunit.
2. A climbing structure in accordance with claim 1, wherein at least two said subunits are climbing subunits (**11,12**).
3. A climbing structure in accordance with claim 1, wherein said first set of fastening means comprises a frame, in particular a round-shaped object, connected to said upper part of said pillar by means of a series of connectors, in particular rods.
4. A climbing structure in accordance with one of the previous claims, **characterized in that** said series of ropes comprising a first series of ropes (**50**) and a second series of ropes (**51**), wherein said first series of ropes comprises structural ropes and said second series of ropes are interconnected into a net.
5. A climbing structure in accordance with one of the previous claims, **characterized in that** said climbing unit comprises an anchoring unit (**60**), said anchoring unit comprises at least three sub-anchoring units (**61**, **62**, **63**) of which at least one said sub-anchoring unit being a climbing sub-anchoring (**61**), whereby said climbing sub-anchoring comprises a tube and supporting means (**65**).
6. A climbing structure in accordance with claim 5, whereby at least two said sub-anchoring units being climbing sub-anchoring units (**61**, **62**).
7. A climbing structure in accordance with one of the previous claims **characterized in that** only a portion of less than 25% of the platform side surface (**70**) of said climbing subunit is connected to said pillar of

said climbing subunit by means of platform fixation means (30).

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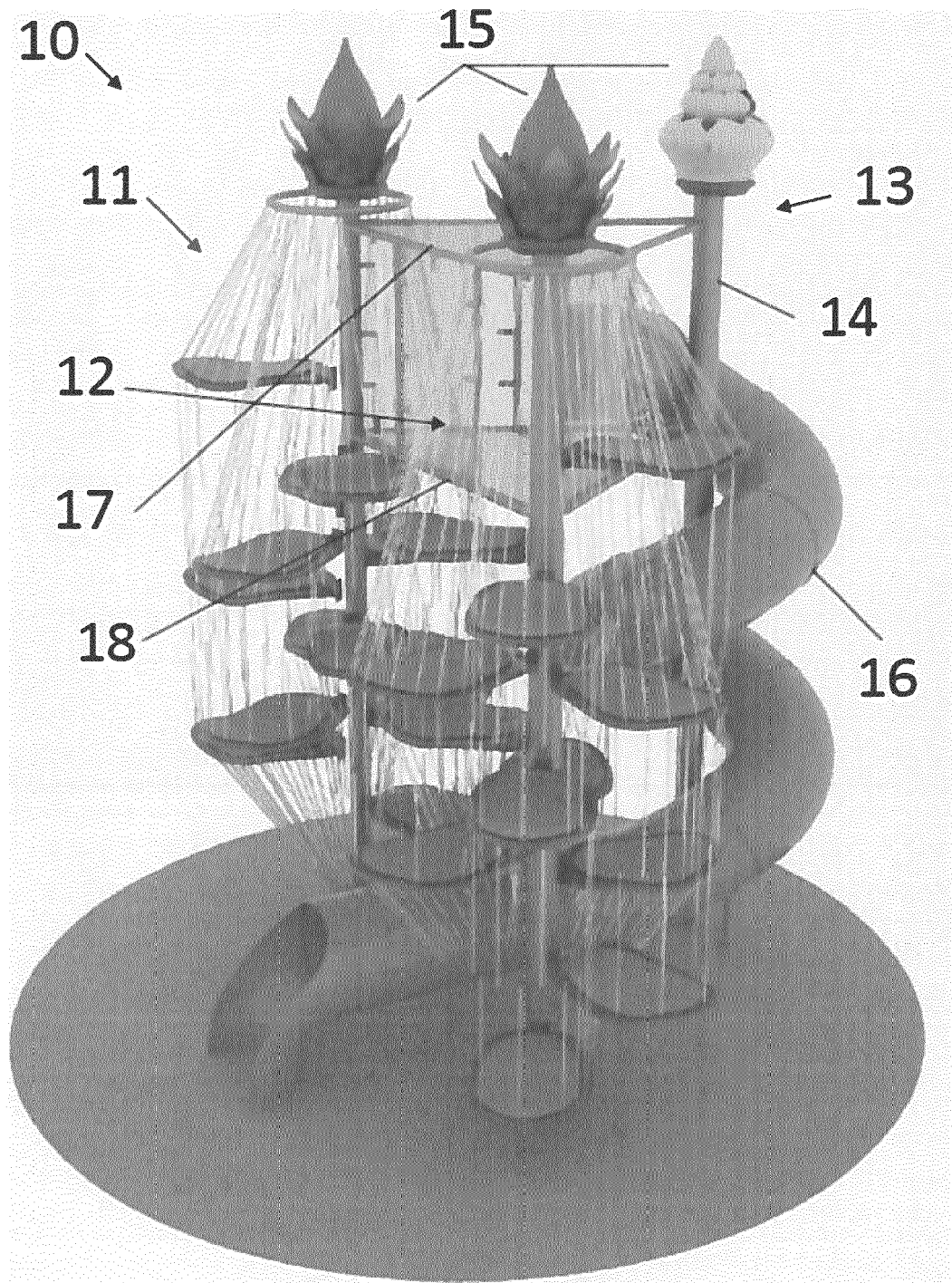


FIG. 1

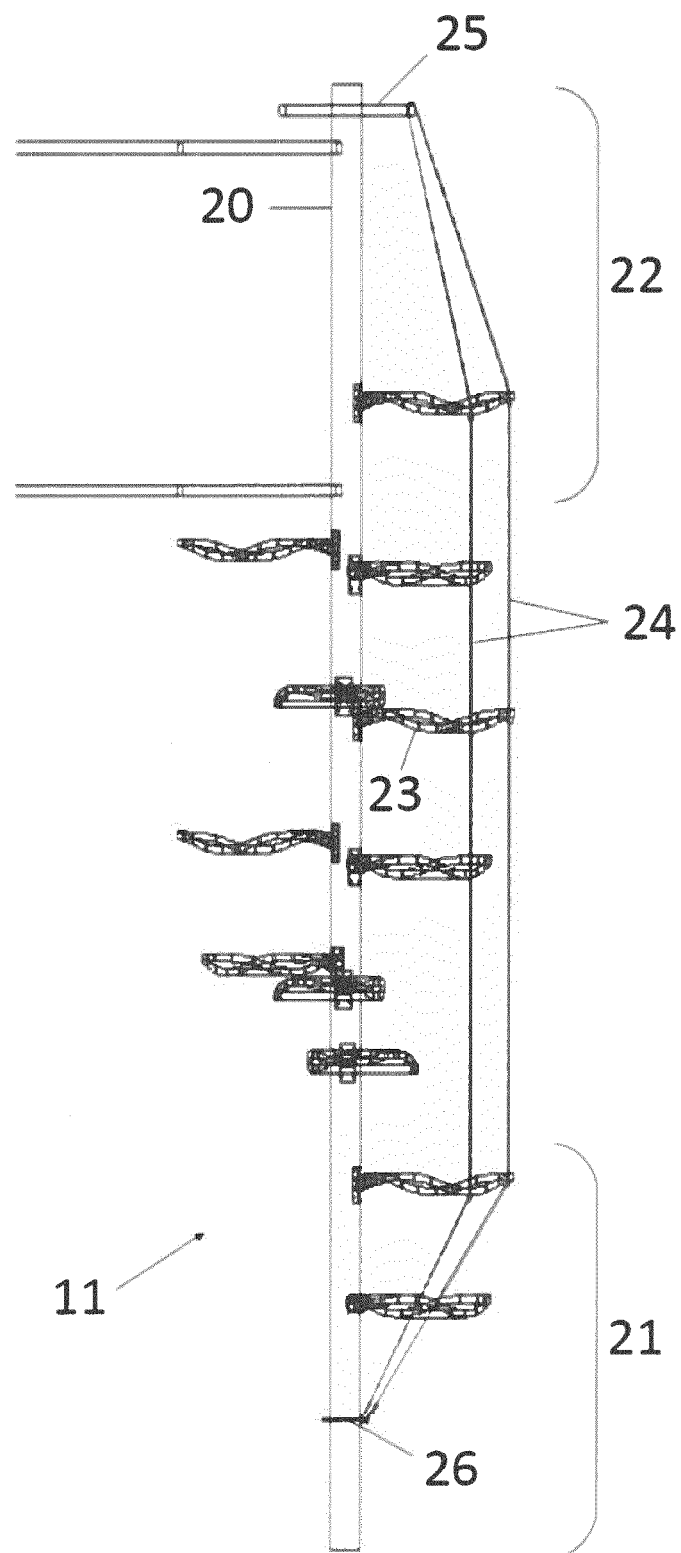


FIG. 2

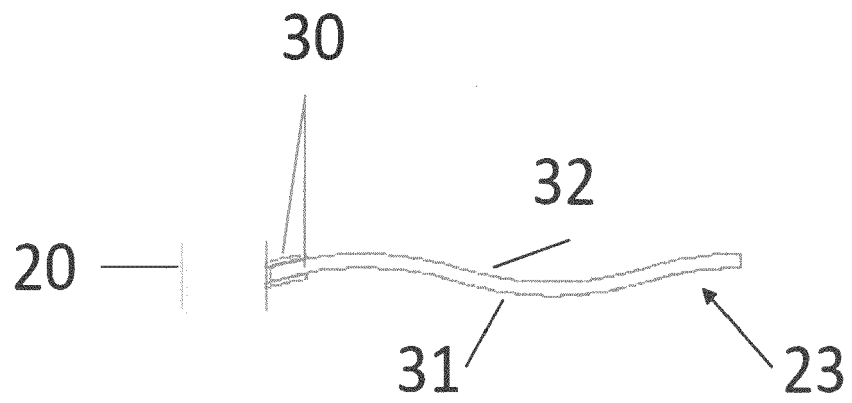


FIG. 3

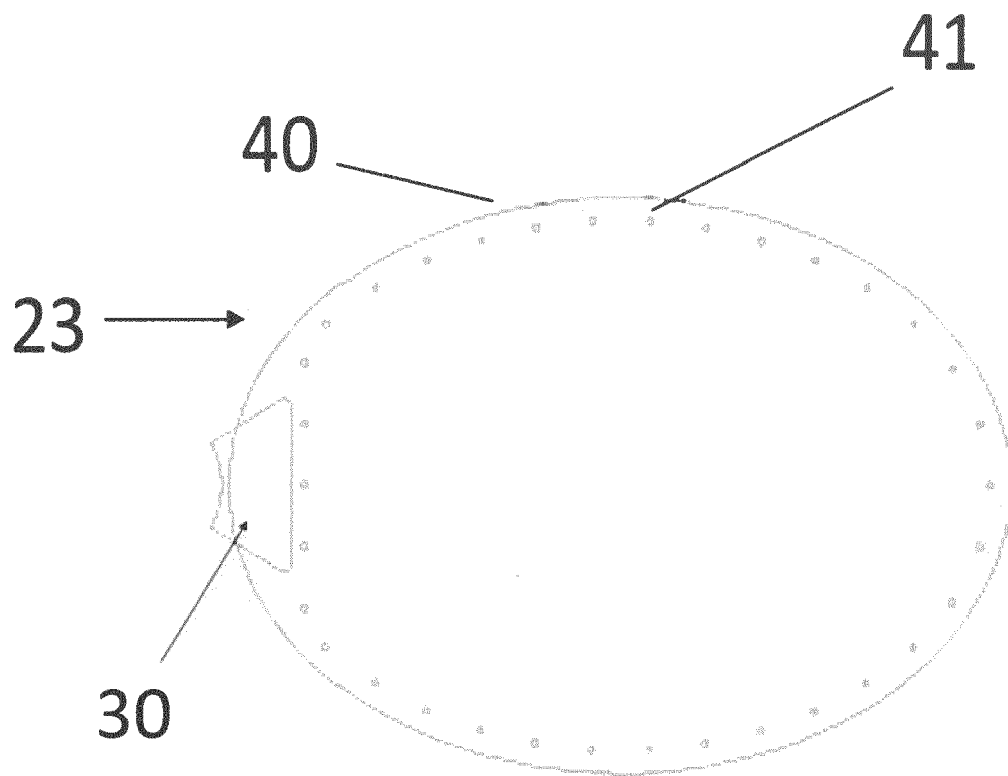


FIG. 4

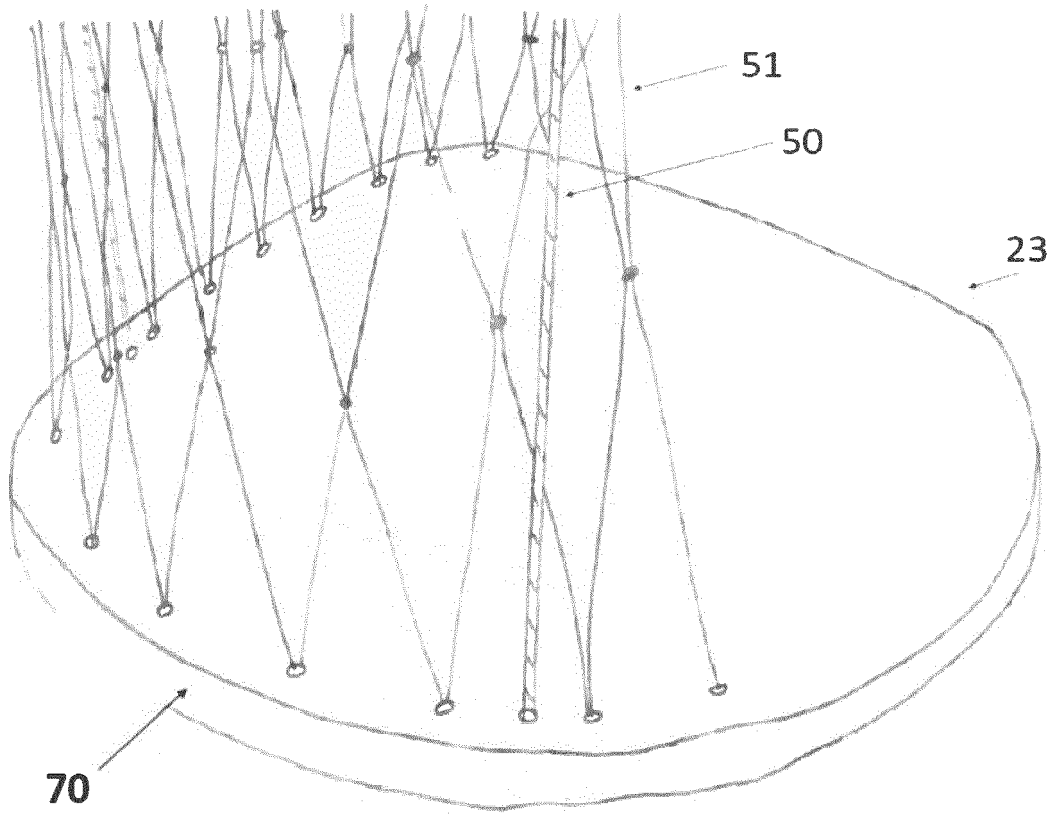


FIG. 5

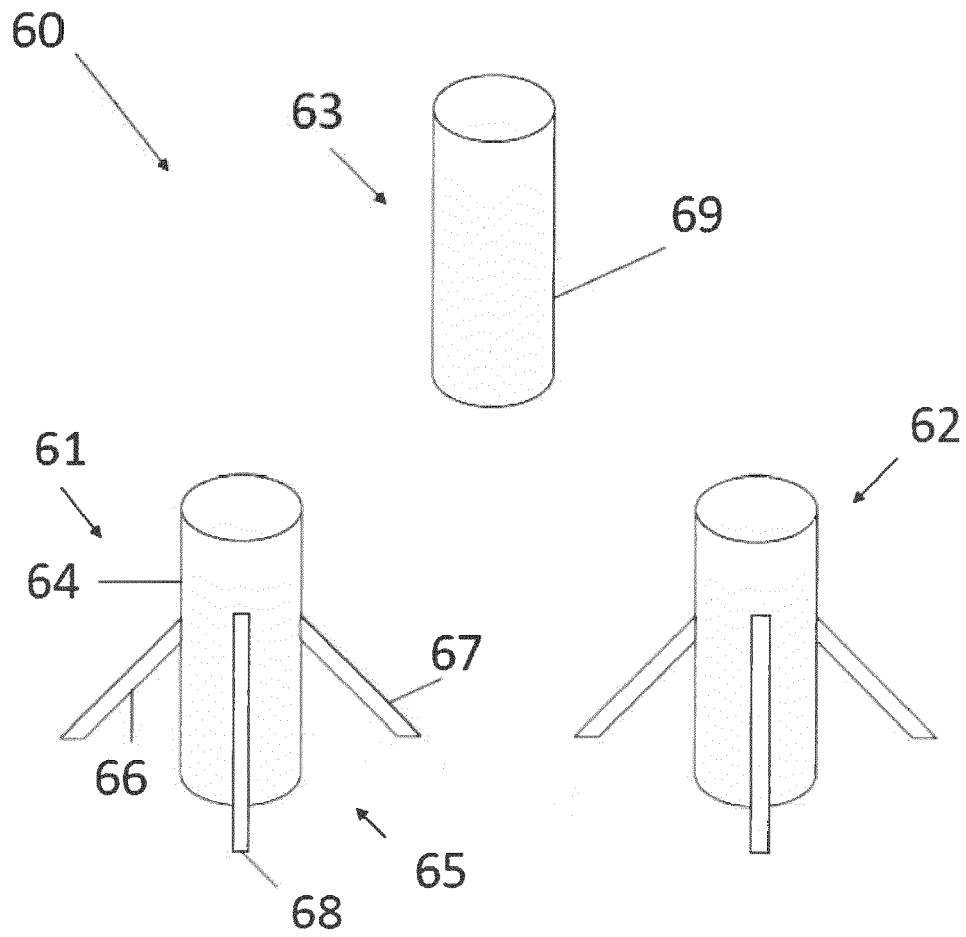


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 August 2015	Examiner Tejada Biarge, Diego
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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