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(54) **FOLDABLE STAND**

(57) The present disclosure relates to a foldable stand (1) with a banner (3) and a framework (5) including a top plate (7) and a base plate (9) coupled via at least one folding segment (11), consisting of at least three folding frames (13), each constructed from two frame parts

(15) coupled via a folding hinge (17). The folding hinges (17) are positioned in such a way that when two frame parts (15) of each folding frame (13) are folded together, a sideways movement of the respective folding hinge (17) is forced outwards.

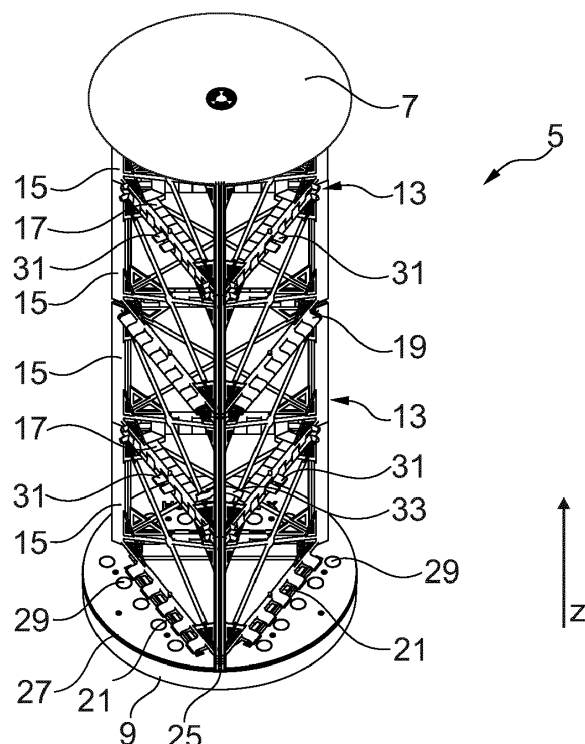


Fig. 4

Description

[0001] The present disclosure relates to a foldable stand with a banner and a foldable framework.

Background of the disclosure

[0002] Stands and especially presentation stands are widely used in large parts of the economy and especially at trade fairs and exhibitions. The presentation stands usually contain or can be equipped with a banner, which is generally provided with information, graphic representations or the like.

[0003] Such banners should be as easy to recognize and read as possible for potential customers and are therefore designed in an appropriate size and shape. Specifically, such banners are often designed as banners extending in a vertical height direction to create a large display area on a narrow footprint. Such banners must be attached to an appropriate framework for this purpose.

[0004] A large number of requirements are placed on such a framework. On the one hand, the scaffold must be stable, on the other hand, the scaffold must be transportable and light. Therefore, especially foldable frameworks for such presentation stands are widespread.

Related art

[0005] For example, DE 20 2008 002 450 U1 discloses a mobile foldable counter having a front panel that is located in the front viewing area of the counter and can be used as a display surface. The counter includes foldable side panels that fold toward an interior side of the counter to place the counter in a transport position.

[0006] The disadvantage of such a design is that the counter requires a large footprint and, due to the two opposing side walls, the counter has little stability without a stiffener. Specifically, torsional rigidity of the counter is reduced and overloading the counter can cause it to fold inadvertently, which compromises safety.

[0007] It is therefore an object of the present disclosure to eliminate or at least reduce the disadvantages of the prior art. Specifically, it is the object of the present disclosure to provide a foldable stand that has a large display area despite a small footprint. Furthermore, the presentation stand should be compactly transportable and protected against unintentional folding.

[0008] This object is solved by a foldable stand of independent claim 1. Advantageous aspects of the present disclosure are claimed in the dependent claims and/ or are described herein below.

[0009] The present disclosure relates to a foldable (presentation) stand, which has or which can be equipped with a banner and which has a framework including a base plate and a top plate coupled via at least one (three-dimensional) folding segment, consisting of or comprising at least three (two-dimensional) folding frames, each constructed from two (two-dimensional)

frame parts coupled via a folding hinge, preferably arranged at or along a lateral edge of the frame parts, respectively. The folding hinges are positioned in such a way (preferably parallel offset to the lateral edge) that when two frame parts of each folding frame are folded together (collapsed position), a sideways movement of the respective folding hinge (linking to frame parts to one folding frame of the at least one folding segment) is forced outwards (away from the other folding frames).

[0010] In other words, the foldable (presentation) stand comprises or is providable with the banner and comprises the framework, which is configured to hold and display the banner in a defined arrangement. The framework comprises a base plate and a top plate. The base plate and the top plate preferably have a (circular) round shape, further preferably with an identical diameter to each other. Alternatively, other shapes of the base plate and the top plate, such as square or polygonal, are also possible.

[0011] The base plate is configured to stand on the ground. Preferably, the base plate can be designed with feet, in particular adjustable feet with a thread or the like. In an expanded/ unfolded state, the top plate is coaxially spaced above the base plate. At least one folding segment is arranged between the top plate and the base plate, which connects the top plate and the base plate with each other. The folding segment includes at least three folding frames. Each of the folding frames comprises two at least substantially identical and/ or symmetrical frame parts preferably in rectangular shape, which are connected to each other via the folding hinge. The folding hinge can be made of the same material as the frame parts.

[0012] The folding hinges are configured and positioned in such a way that when the foldable stand is folded, i.e. when the top plate is moved towards the bottom plate, the folding hinges of the different folding frames move away from each other, in particular in a star shape. In yet other words, the folding frames fold outward when the foldable stand is vertically folded.

[0013] Such a design of the foldable stand can significantly reduce the footprint of the stand, as the individual folding frames can be positioned closer to each other. Furthermore, the outward folding direction ensures that the foldable stand will not collapse if one of the folding frames is accidentally bumped from the outside. By providing at least three folding frames, a torsional stiffness of the foldable stand can further be significantly increased.

[0014] The stand is preferably a presentation stand, with the banner filled with information or graphics. Alternatively, the banner can be monochrome or multicolored and the display can be a lamp.

[0015] In a first aspect, the folding hinges may be located inside with respect to the respective folding frame.

[0016] In other words, the folding hinges and especially a pivot axis of the folding hinges may be positioned on a side of the folding frame, which is oriented towards a

center axis of the top plate and the bottom plate. In still other words, the folding hinges may be arranged so that the folding hinges of the different folding frames of a folding segment face each other.

[0017] Such a design allows a smooth outer surface of the folding segment to be achieved. Furthermore, the folding hinges can be protected from damage in this way.

[0018] In another aspect, the folding hinge may be a knee joint/ toggle joint.

[0019] A knee joint has the advantage that an increased force must first be applied to release the folding frame from an upright/ opened position, but after overcoming this first increased force, further folding requires less force. This ensures that an unintentional folding of the stand is prevented and that it can still be folded together and be unfolded with a manageable amount of force.

[0020] In another aspect, the knee joint in the upright state of the foldable stand may be overextended, preferably to 190°.

[0021] In other words, the knee joint may be overshot by approximately 10°, based on an aligned orientation.

[0022] Such a configuration makes unintentional collapse even more difficult and less likely to occur. In addition, the extended position can safely be maintained even in case a security or locking element for keeping the segment in the extended position is missing.

[0023] In another aspect, each of the frame parts may be formed with two pillars extending parallel in a height direction in an upright condition of the stand. The pillars of the two frame parts of a folding frame are arranged in such a way that the pillars stand on each other in the upright state and absorb a vertically acting force. This relieves the load on the folding hinges.

[0024] In another aspect, the three folding frames may form an equilateral triangle in a top view of the stand and the base plate and the top plate may form a round circle. The triangle may be positioned off-centre with respect to the round circle in such a way, that a tip of the triangle is positioned on the (edge of the) circle.

[0025] In other words, the folding segment in the upright position may form a cylinder with a triangular base. The triangular base may be equilateral. Two folding frames meet in each of the apexes/ tips of the triangle. The folding segment is arranged/aligned off-center to the top plate and the base plate, so that exactly one corner of the folding segment lies on the edge of the base plate and the top plate. In still other words, a (single) pillar of the frame part may extend between the edges of the top plate and the base plate.

[0026] As described above, the base plate and the top plate can also have shapes other than a circle/ a round shape. In this case, the tip of the triangle is located on the edge of the shape of the top plate and base plate.

[0027] Furthermore, the folding segments may also have other geometries, such as a square. Then a corner of the square may be located on the edge of the top plate and base plate.

[0028] Such a design allows the banner to be attached to the one pillar so that the banner is fixed and at the same time there is as little contact as possible between the framework and the banner, since such contact would result in an undesirable visual impression, for example shadows, on the banner.

[0029] In another aspect, each folding segment may comprise hinges at its upper- and lower-most lateral edges being adapted to be linked to the top and base plates, respectively. In addition, the upper- and lower-most hinges are also adapted to get linked to each other, such that at least two folding segments may be arranged on top of each other between the base plate and the top plate and connected to each other via thru axles.

[0030] In other words, any number of folding segments may be stacked on top of each other and connected to each other, for example, by thru axles/ plug-in axles. The thru axles can be provided on the edges of the frame parts on which no pillar is formed.

[0031] Such a design of the folding segment allows a variety of different heights of the foldable stand to be formed with only one type of folding segment. Optionally, this design also allows subsequent adaptation of the foldable stand to different banner sizes/ banner heights. Examples of heights are 60 cm, 110 cm, 160 cm, 210 cm or 260 cm.

[0032] In another aspect, the adjacent folding frames of one single folding segment are connected to each other by retaining elements that accommodate the thru axles.

[0033] In other words, retaining elements may be arranged in the corner sections of the folding segment, connecting two thru axles to each other. The retaining element may be a substantially angular element having two axis receptacles in the form of holes arranged at 90 degrees to each other.

[0034] By fixing the thru axles to each other, a ring-shaped connection is formed between the two folding segments at a point/ line of contact, and a concertina-shaped folding outwards and inwards of the foldable stand is implemented.

[0035] In another aspect, the folding frames may contain at least one vertical groove formed along at least one side edge of each folding frame, which vertical groove, in the upright state of the foldable stand, preferably in corner sections of the folding segment, extend vertically between the base plate and the top plate.

[0036] In other words, the pillars each comprise at least one vertical groove extending in a longitudinal direction of the pillar. In particular, the groove may be directed towards an outer side of the foldable stand. Here it is preferable to position the vertical groove with respect to the top and base plates such that it is substantially in line with the outer edge of the top and base plates, respectively, especially because of the decentral position of the at least one segment with respect to the top and base plates.

[0037] The vertical groove (being in line with the outer

edge of the plates) may be configured to fix the banner with a force fit. Alternatively, a Velcro fastener or similar can be formed in/ on the groove. In this way, the banner can be securely fixed to the framework.

[0038] In another aspect, the folding frames may have at least one, preferably two, handles on an outwardly directed side of the folding hinges, which handles act as an actuating mechanism for folding the folding segment.

[0039] In other words, each of the frame parts may comprise the handle, which extends vertically outward away from the folding frame. The handles may be arranged/ formed in an area of the hinges.

[0040] Such handles facilitate folding of the foldable stand.

[0041] In another aspect, the base plate and the top plate may include a horizontal circumferential groove on a circumferential outer surface.

[0042] In other words, both the base plate and the top plate may be formed with a circumferential groove at the periphery, the groove being formed close to the at least one folding segment, i.e. an intermediate space between the top plate and the base plate.

[0043] The horizontal circumferential grooves can receive and secure the banner in the same way as the vertical groove.

[0044] In another aspect, the banner may surround the framework in the form of a sleeve or be detachably wrapped around the framework.

[0045] In another aspect, the banner may have a substantially circumferential piping and the vertical and horizontal grooves may be configured to receive the piping in a force-fitting manner.

[0046] In other words, the banner may comprise a preferably rubberized edge, which is configured to be gripped by the grooves of the framework in a force-fit manner.

[0047] Such a piping or rubberized edge can ensure that the banner is firmly attached to the framework and can be assembled and disassembled without tools.

[0048] In another aspect, the piping may be bent in the horizontal groove in a longitudinal direction.

[0049] In other words, the piping may be aligned parallel to the top plate and the base plate.

[0050] Aligning the piping in this manner allows tension to be created in the banner, fixing the banner more tightly over the framework.

[0051] In another aspect, the base plate and the top plate may comprise LEDs, which may be arranged outside the folding segment in the top view.

[0052] In other words, both the top plate and the base plate contain LEDs that radiate in facing directions. In still other words, the LEDs of the base plate radiate in the direction of the top plate and the LEDs of the top plate radiate in the direction of the base plate.

[0053] Of course, other illuminants such as neon tubes or halogen lamps may also be conceivable.

[0054] In another aspect, the banner may be partially transparent. In other words, the banner can be translucent and lighting placed behind the banner, for example,

the LEDs can make the banner glow.

[0055] Such a configuration of banner, LEDs and top and base plate can achieve uniform illumination of the banner from a back side of the banner.

[0056] In another aspect, the folding frames in a folded state of the foldable stand may be substantially parallel to the base plate and the top plate.

[0057] In other words, in the folded state, the frame parts may lie stacked on top of each other. This enables compact transport and storage of the framework.

[0058] In another aspect, a locking element may be formed between adjacent frame parts of two mutually different folding frames, which reversibly connects the adjacent frame parts to one another and prevents folding of the frame parts and thus folding of the foldable stand.

[0059] In other words, the locking element, preferably in the form of a hook, latch or strap, may be configured to be fixed between two adjacent folding frames. By fixing the adjacent folding frames to each other, a relative movement of the folding frames to each other and thus a folding of the frame is prevented.

[0060] In another aspect, each of the frame members may be formed as a truss. Preferably, a cross brace is formed in each of the frame members.

[0061] In another aspect, the framework may be formed from plastic material, in particular injection molded parts.

[0062] In another aspect, a control device and/ or a transformer of the LEDs may be provided in the base plate.

[0063] In another aspect, the top plate LEDs may be connected to the bottom plate LEDs or the control device via a cable. The cable preferably runs within the at least one folding segment.

[0064] In another aspect, cable retainers may be formed on the folding segment.

[0065] In another aspect, a diameter of the top plate and the base plate may be at least 400 mm.

[0066] In another aspect the foldable stand may comprise a table top on/ as the top plate and may function as a foldable high table.

[0067] It is intended to claim the above aspects individually or in any combination with each other. In other words, the above aspects and their order does not mean a specific dependency from each other but shall be understood as a list of individual and isolated features of the presentation stand according to the present disclosure.

Brief description of figures

[0068] The disclosure is explained in more detail below using preferred embodiments and referring to the accompanying figures.

Fig. 1 shows a perspective view of a foldable stand according to the present disclosure.

Fig. 2 shows a first side view of a framework of the foldable stand according to the present disclosure.

Fig. 3 shows a second side view of the framework of the foldable stand according to the present disclosure.

Fig. 4 shows a perspective view of the framework of the foldable stand according to the present disclosure.

Fig. 5 shows a sectional view of the framework of the foldable stand according to the present disclosure.

Fig. 6 shows a perspective view of the framework of the foldable stand according to the present disclosure, wherein the framework is in a folded state.

Detailed description of preferred embodiments

[0069] Fig. 1 shows a foldable stand in the shape of a foldable presentation stand 1 with a banner 3 and a framework 5. The presentation stand 1 has an essentially circular cylindrical shape. In other words, the presentation stand 1 of this embodiment has a barrel shape. However, other shapes such as cuboid are also conceivable. The banner 3 forms an outer surface of the presentation stand 1 and surrounds the frame 5 essentially completely in a height direction Z. The framework includes a top plate 7 and a base plate 9, which limit the banner 5 in the height direction Z. In other words, the top plate 7 and the base plate 9 form end plates of the presentation stand 1 in the height direction Z. In an unrolled state, the banner 3 has a rectangular shape and includes a piping (not shown) that surrounds the banner 3 in a frame-like manner. The banner 5 is reversibly fixed to the top plate 7 and the base plate 9, preferably by frictional locking.

[0070] Fig. 2 shows the framework 5 of the presentation stand 1 in a first side view. Fig. 3 shows the framework 5 in a second side view, which is oriented 90 ° rotated to the first side view. The framework 5 comprises the top plate 7 and the base plate 9. The top plate 7 and the base plate 9 are connected via two folding segments 11, which are stacked on top of each other. Alternatively, of course, only one folding segment 11 or a number of folding segments 11 can be formed between the top plate 7 and the base plate 9.

[0071] Each of the folding segments 11 comprises three folding frames 13, which are arranged in a triangular shape in the upright state of the framework 5 shown here. Each of the folding frames 13 comprises two frame parts 15, which are connected by folding hinges 17 in the form of knee joints. The folding hinges 17 are each formed on the folding frame 13 oriented towards a center of the folding segment 11. The frame part 15 is designed as a truss which is formed with a central cross.

[0072] The folding segments 11 are connected to each other via thru axles 19. In particular, adjacent frame parts 15 of the various folding segments 11 are connected to each other via edges facing away from the folding hinge 17 by means of thru axles 19. On the opposite side of the thru axle 19, the folding frames 13 are hinged to the top plate 7 or the base plate 9 by means of a connection 21. The connection 21 is similar in structure to the thru axle 19. The connection 21, the folding hinges 17 and the thru axle 19 are not aligned in the height direction Z. The folding hinge 17 is offset inwards compared to the connection 21 and the thru axle 19 (see also Fig. 4).

[0073] Each of the frame parts 15 includes a pillar 23 at vertical edges, that is, the edges at which neither the connection 21 nor the thru axle 19 is formed. Each of the pillars 23 includes a vertical groove 25, which extends along the entire longitudinal extent of the pillar 23. The vertical groove 25 has essentially a rectangular cross-sectional shape and is configured and designed to frictionally secure the banner 3 via the piping. The vertical grooves 25 of the pillars 23 arranged one above the other are aligned in the upright state of the presentation stand 1.

[0074] Furthermore, the top plate 7 and the base plate 9 are each formed with a circumferential horizontal groove 27. The horizontal groove 27 is also configured to secure the banner 3 via the piping.

[0075] Fig. 3 and Fig. 4 as well as Fig. 5, which is a horizontal section through the framework 5, show that the two stacked folding segments 11 are arranged eccentrically with respect to the base plate 9 and the top plate 7. One pair of the pillars 23, which forms a corner region of the triangle formed by the folding segment 11, is aligned with the edge of the top plate 5 and the base plate 9. In a contact area of the pillar 23 and the edge of the top plate 7 and the base plate 9, the vertical groove 25 merges into the horizontal groove 27. This arrangement allows the banner 3 to be securely fixed both in the vertical direction by the vertical groove 25 and in the horizontal direction by the horizontal groove 27.

[0076] Fig. 4 and Fig. 5 further shows that LEDs 29 are formed in the base plate 9. The LEDs 29 radiate in the direction of the top plate 7. The LEDs are arranged so that they surround the folding segment 11 in the direct vicinity of the connection 21. LEDs are also formed in the top plate 7 and radiate in the direction of the base plate 9. The LEDs provide an evenly distributed amount of light in the space between top plate 7 and base plate 9, which shines out through the banner 5, which is semi-transparent, and makes the banner 5 itself shine.

[0077] Two handles 31 are formed in the areas of each of the folding hinges 17. The handles 31 allow a user to deflect the folding hinges 17 outward and collapse the presentation stand 1. Furthermore, a locking element 33 is shown in both Fig. 3 and Fig. 4. The locking element 33 is configured to be fixed between two horizontally adjacent folding frames 13 and to block a horizontal movement between them. In this way, unintentional folding of

the presentation stand 1 can be reliably prevented.

[0078] Fig. 6 shows the framework 5 of the presentation stand 1 in a folded state. The folding process is described below with reference to Fig. 2 through Fig. 6.

[0079] In a first step, the locking element 33 is released. Specifically, the form-fit connection, which is established by the locking element 33, is released. In a second step, the user pulls the folding hinges 17 outward using the handles 31, whereby an increased initial force must be overcome due to the design of the folding hinges 17 as knee joints. The folding hinges 17 move outward in a star shape with inner surfaces of the folding frames 13 moving toward each other. The thru axles 19 of adjacent folding frames 13 are connected to each other via retaining elements 35 in such a way that the thru axles 19 can only perform a movement in the vertical direction Z. This results in a concertina-shaped folding of the framework 5 or the number of folding segments 11 on top of each other.

[0080] When the framework 5 is in the folded state shown in Fig. 6, the frame parts 15 are aligned substantially parallel to each other and substantially parallel to the top plate 7 and the base plate 9. The folding hinges 17 are arranged horizontally adjacent to each other. Furthermore, the connection 21 in the top plate 7, the thru axle 19 and the connection 21 in the base plate 9 are arranged vertically one above the other in direct proximity.

Reference signs

[0081]

1	presentation stand
3	banner
5	framework
7	top plate
9	base plate
11	folding segment
13	folding frame
15	frame part
17	folding hinges
19	thru axle
21	connection
23	pillar
25	vertical groove
27	horizontal groove
29	LED
31	handle
33	locking element
35	retaining element
Z	height direction

Claims

1. A foldable stand (1) with

a banner (3) and

a framework (5) including a top plate (7) and a base plate (9) coupled via at least one folding segment (11), consisting of at least three folding frames (13), each constructed from two frame parts (15) coupled via a folding hinge (17), **characterized in that** the folding hinges (17) are positioned in such a way that when two frame parts (15) of each folding frame (13) are folded together, a sideways movement of the respective folding hinge (17) is forced outwards.

2. The foldable stand (1) according to claim 1, **characterized in that** the folding hinges (17) are located inside with respect to the respective folding frame (13).
3. The foldable stand (1) according to claim 1 or claim 2, **characterized in that** the folding hinge (17) is a knee joint.
4. The foldable stand (1) according to claim 3, **characterized in that** the knee joint in an upright state of the foldable presentation stand (1) is overextended, preferably to 190°.
5. The foldable stand (1) according to one of claims 1 to 4, **characterized in that** the three folding frames (13) form an equilateral triangle in a top view of the presentation stand (1) and the base plate (9) and the top plate (7) each form a round circle, the triangle being positioned off-centre with respect to the round circle in such a way that a tip of the triangle lies on the (edge of the) circle.
6. The foldable stand (1) according to one of claims 1 to 5, **characterized in that** at least two folding segments (11) are arranged on top of each other between the base plate (9) and the top plate (7) and connected to each other via thru axles (19).
7. The foldable stand (1) according to claim 6, **characterized in that** adjacent folding frames (13) are connected to each other by retaining elements (35) that accommodate the thru axles (19).
8. The foldable stand (1) according to one of the claims 1 to 7, **characterized in that** the folding frames (13) contain at least one vertical groove (25) which, in the upright state of the foldable presentation stand (1), preferably in corner sections of the folding segment (11), extend vertically between the base plate (9) and the top plate (7).
9. The foldable stand (1) according to one of the claims 1 to 8, **characterized in that** the folding frames (13) have at least one, preferably two, handles (31) on an outwardly directed side of the folding hinges (17),

which handles (31) act as an actuating mechanism for folding the folding segment (11).

10. The foldable stand (1) according to one of the claims 1 to 9, **characterized in that** the base plate (9) and the top plate (7) include a horizontal circumferential groove (27) on a circumferential outer surface. 5
11. The foldable stand (1) according to claim 8 or 10, **characterized in that** the banner (3) has a substantially circumferential piping and the vertical and horizontal grooves (25, 27) are configured to receive the piping in a force-fitting manner. 10
12. The foldable stand (1) according to claim 11, **characterized in that** the piping is bent in the horizontal groove (27) in a longitudinal direction. 15
13. The foldable stand (1) according to claim 1 to 12, **characterized in that** the base plate (9) and the top plate (7) comprise LEDs (29), which are arranged outside the folding segment (11) in the top view. 20
14. The foldable stand (1) according to claim 1 to 13, **characterized in that** the folding frames (13) in a folded state of the foldable presentation stand (1) are substantially parallel to the base plate (9) and the top plate (7). 25
15. The foldable stand (1) according to claim 1 to 14, **characterized in that** a locking element (33) is formed between adjacent frame parts (15) of two mutually different folding frames (13), which reversibly connects the adjacent frame parts (15) to one another and prevents folding of the frame parts (15) and thus folding of the foldable presentation stand (1). 30 35

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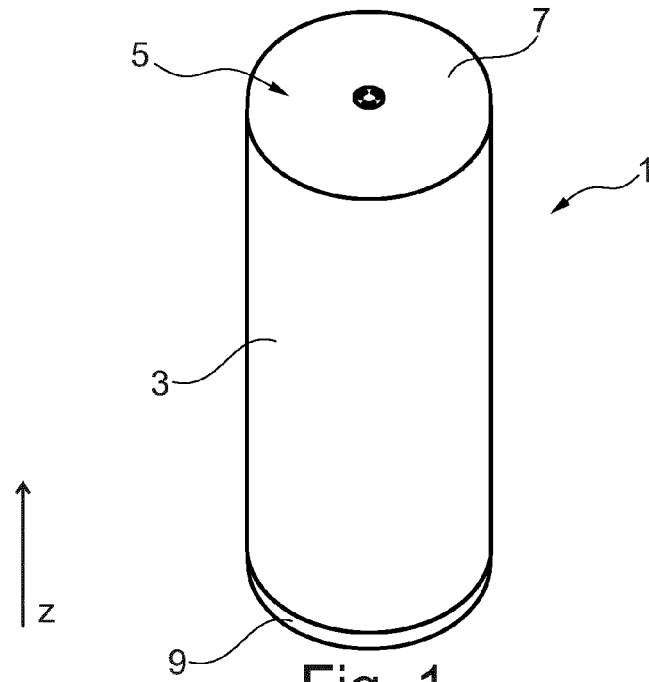


Fig. 1

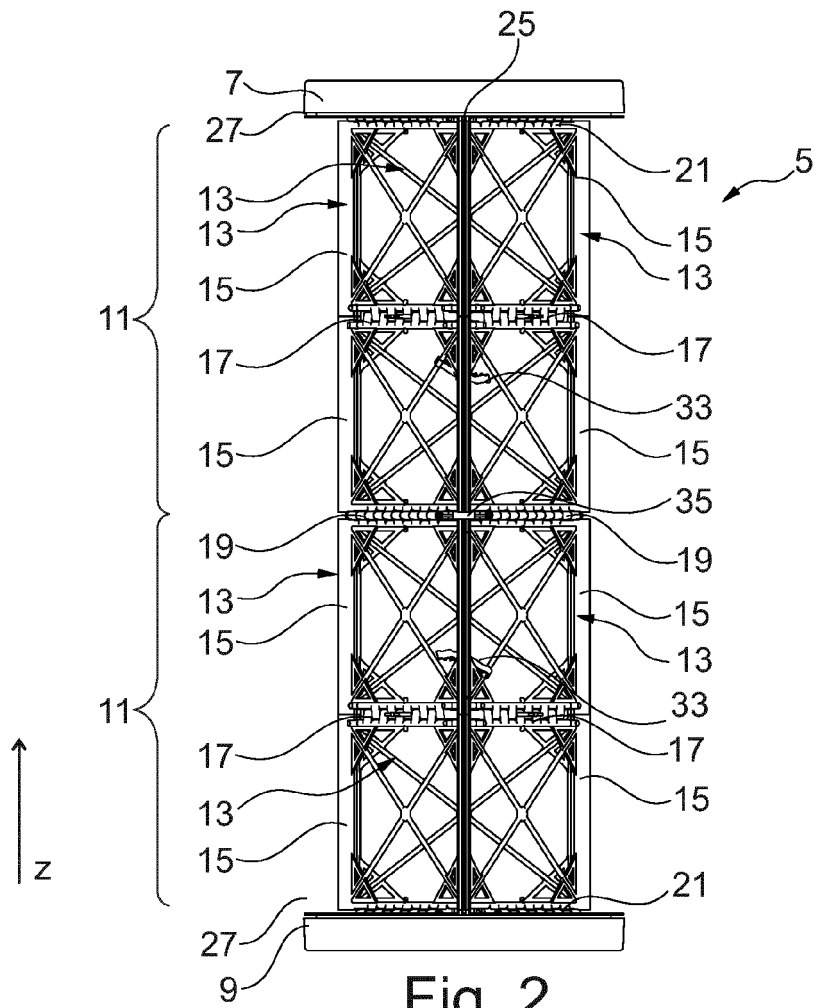
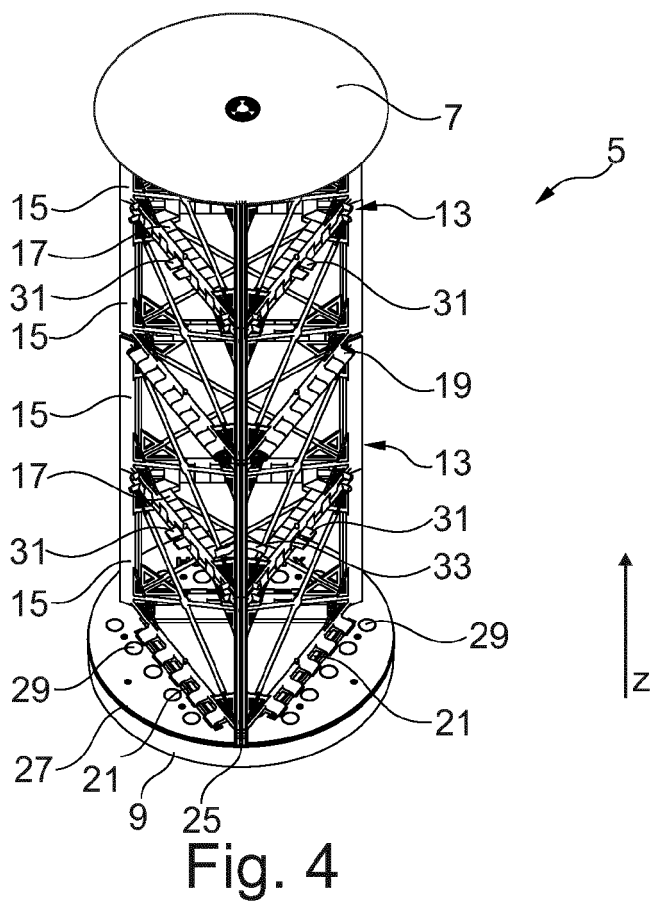
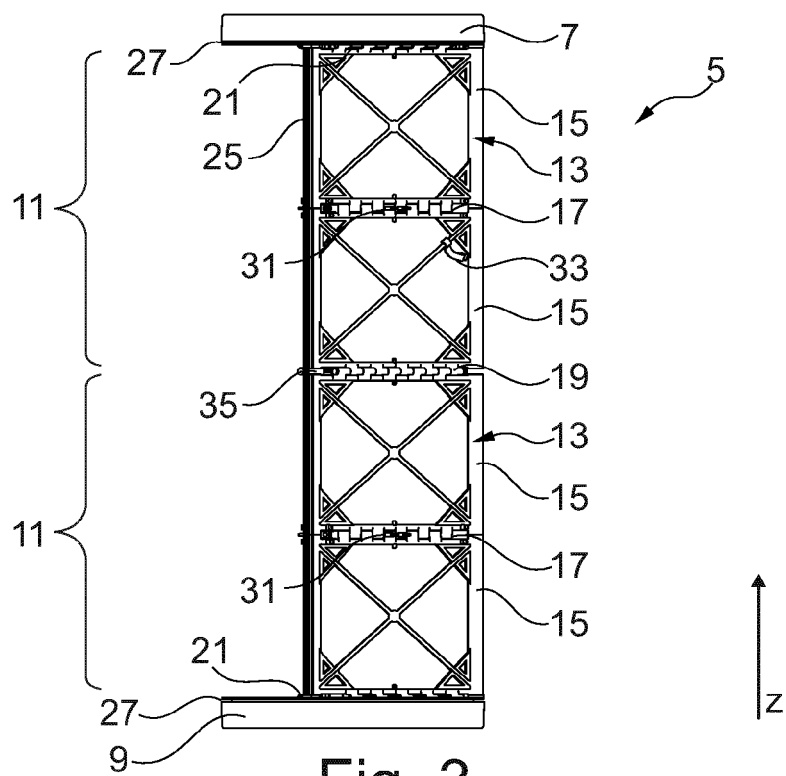


Fig. 2



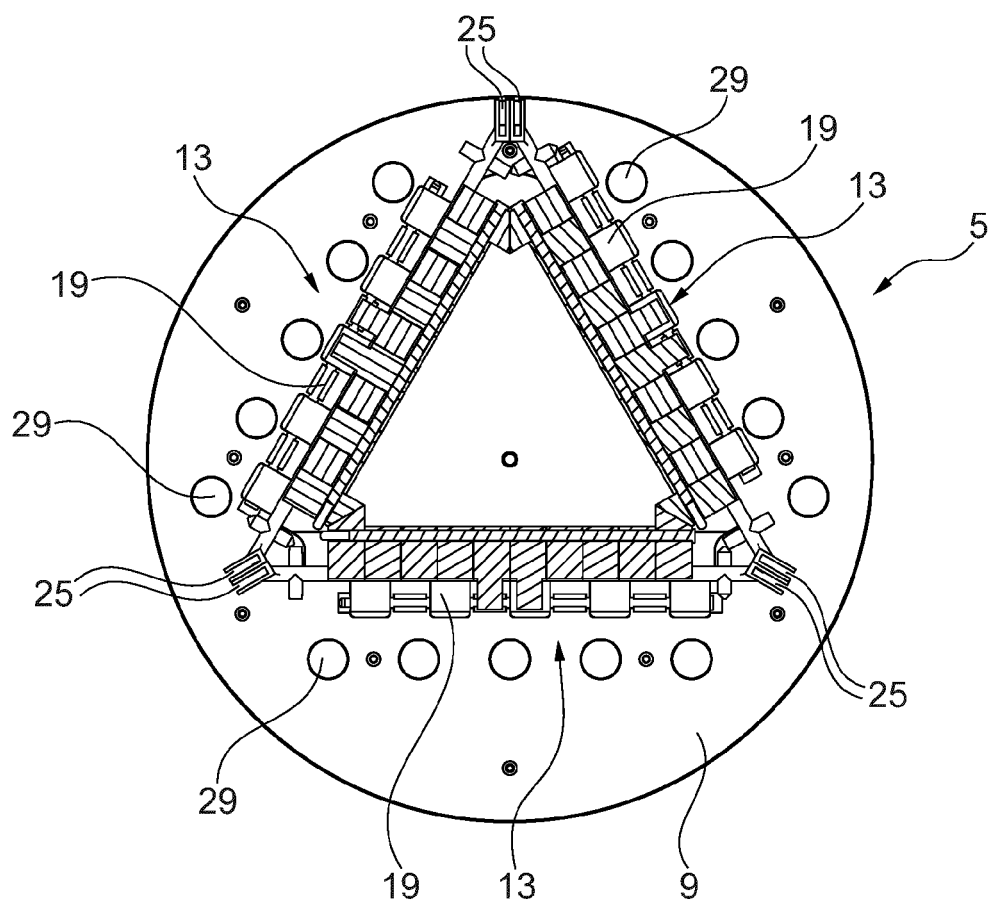


Fig. 5

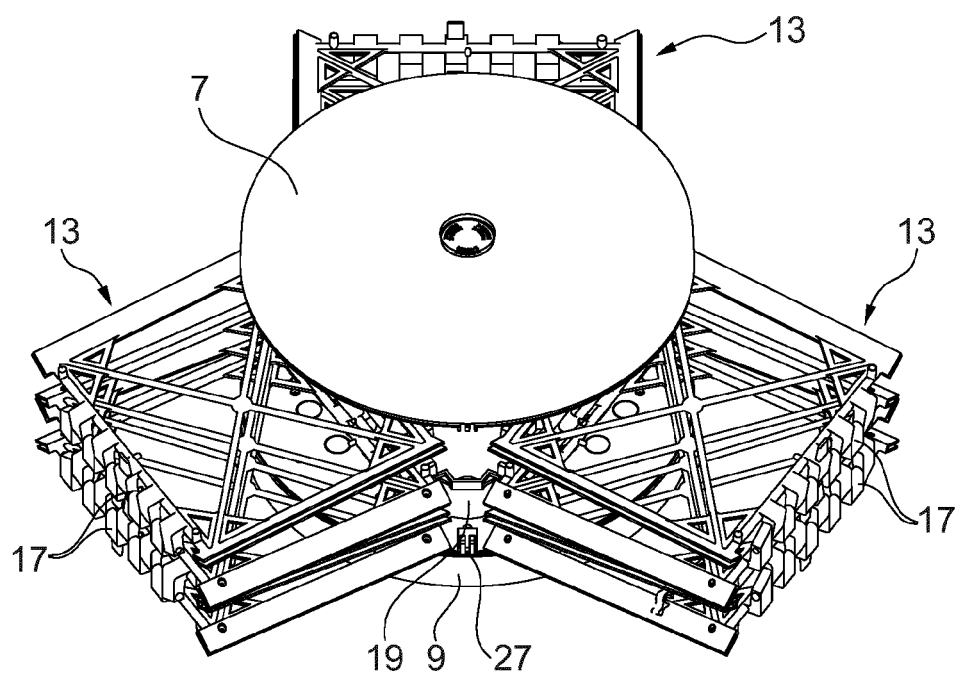


Fig. 6



EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			G09F A47F E04H B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 August 2023	Examiner Pantoja Conde, Ana
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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04-08-2023

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