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(54) **STRUCTURE**

(57) There is provided a structure (2) including sheet material (4) supported by and connected to a series of frame members (6). The frame members are each connected to a common location means (10), wherein the location means includes a base (12) to which the frame members are connected and movement means (16) as-

sociated with the base. Relative movement of the movement means and base allows the frame members, and hence the sheet material, to move between the storage and erected conditions. The movement means is actuable by a user and includes locking means to allow the structure to be locked in at least the erected condition.

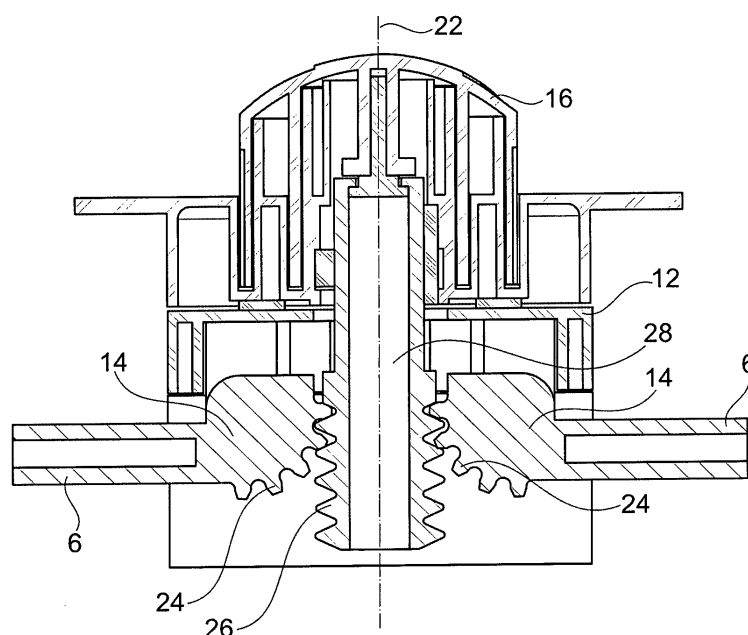


Fig. 2b

Description

[0001] The invention to which this application relates is a structure which can be used for a number of potential uses such as a tent, a play structure, a storage structure, accommodation structure or the like and which is hereonin referred to as a structure.

[0002] The structure to which the invention relates is of the type which includes a series of frame members which act to support one or more portions of sheet material in a relatively taut condition in order to form the structure in a condition for use and which condition is hereonin referred to as the erected condition. While the structure is required to be in the erected condition for use there is a common desire for the structure to be capable of being moved to a collapsed or storage condition for storage purposes when the structure is not required. This can be achieved, in its simplest form, by removing the frame members from the sheet material and folding up the sheet material. However there has been an increasing desire for the structure parts to be retained intact in both the storage and erect conditions so as to allow ease and the time for movement of the structure between the two conditions to be improved. In order to achieve this it is known to provide the frame members of a resilient deformable material which has sufficient resilience to maintain the structure in the erected condition but which can be manipulated by the user, typically by twisting and forming the frame members into smaller loops, to move the frame members and the sheet material still associated therewith into the storage condition.

[0003] While this format has been extremely successful it is known that users have problems in being able to manipulate the frame members. Another form of movement of structures of this type which is known is to provide the frame members in a manner similar to that of an umbrella frame in which the frame members depend outwardly from a common peak. While systems are known in order to be able to move the frame members between a mutually extended position about the peak, in which the structure is in the erected condition and, to lie substantially parallel in which the structure is in the storage condition, the known systems are found to be difficult to manipulate and/or create safety concerns, especially when the structures are for use by children, as some are known to use a cord and pulley system to change the structure condition.

[0004] As a result of these problems, an aim of the invention is to provide a structure which can be moved between erected and storage conditions with the sheet material connected to the frame members in both conditions and during movement between the same and to allow the movement to be achieved in an efficient and safe manner.

[0005] In a first aspect of the invention there is provided a structure including sheet material supported by and connected to a series of frame members, said frame members each connected to a common location means,

wherein said location means includes a base to which the frame members are connected and movement means associated with the base such that relative movement of the movement means and base allows the frame members, and hence the sheet material, to move between the storage and erected conditions, said movement means actuatable by a user and including locking means to allow the structure to be locked in at least the erected condition.

[0006] In one embodiment the relative movement includes a linear movement component and which linear movement causes the frame members to be moved between the storage and erected conditions. In one embodiment once the frame members have been moved to the erected condition, rotational movement allows a locking of the frame members in the erected condition.

[0007] In one embodiment the relative movement includes a rotational movement component of the movement means with respect to the base and typically rotation about an axis which is substantially parallel with the frame members when the same are in the storage condition.

[0008] In one embodiment there is provided a mechanical drive connection between the frame members and the base, and in one embodiment, between the frame members and the movement means.

[0009] In one embodiment the location means is mounted with respect to the structure such that the same forms a peak of the structure when it is erected.

[0010] In one embodiment the frame members are manufactured from a resilient material, and in one embodiment are formed of a single unitary member. Alternatively the frame member can be formed of a number of portions which are relatively movable to allow the same to be moved to a reduced length storage position. In one embodiment the movement is achieved by relative pivotal movement of the portions and/or relative linear movement.

[0011] In one embodiment the shape and/or movement of the frame members is constrained by the location of the same with the sheet material. In one embodiment the location is achieved by passing the frame member along an envelope formed by the sheet material or by passing the same through a series of loops at spaced intervals.

[0012] In one embodiment the frame member, typically via the end which opposes the end at the location means, is prevented from moving in a substantially linear direction away from the location means.

[0013] In one embodiment the location means is provided as an assembly which is located with, and supported by, the frame members and can be actuated from externally of the structure when the same is in both storage and erected conditions. This therefore avoids the need for the user to gain access to the interior of the structure at any stage to move the structure between conditions, and also avoids the need for any movement or actuation means and/or support means to be located

internally of the structure. This therefore avoids any potential safety concerns and makes all of the interior of the structure available for use with no obstructions.

[0014] In a second aspect of the invention there is provided a method of moving a structure between erected and storage conditions, said structure including sheet material supported by, and connected to, a series of frame members, said method comprising the steps of connecting said frame members to a common location means, wherein said location means includes a base to which the frame members are connected and movement means associated with the base such that relative movement of the movement means and base allows the frame members, and hence the sheet material, to move between the storage and erected conditions, said movement means actuable by a user and including locking means to allow the structure to be locked in at least the erected condition.

[0015] Specific embodiments of the invention are now described with reference to the accompanying drawings wherein;

Figures 1a and b illustrate in schematic manner a structure in accordance with one embodiment of the invention in storage and erected conditions respectively;

Figure 1c illustrates a further form of the structure of Figure 1b;

Figures 2a-c illustrate a location means assembly in accordance with one embodiment of the invention; and

Figures 3a and b illustrate a further embodiment of a location means assembly in accordance with the invention.

[0016] Referring firstly to Figures 1a and b there is illustrated a structure 2 in accordance with the invention in a storage condition, shown in Figure 1a, and in an erected condition, shown in Figure 1b. The structure includes sheet material 4 which is connected with, and supported by, a number of frame members 6, shown in broken lines and which are typically located in the interior of the structure and pass through loops and/ or envelopes which serve to allow movement of the frame members in predefined directions and restrict movement in other directions so as to allow the structure to move between the erected and storage conditions. The frame members are formed of one or more elongate members and in one embodiment each frame member is formed from one elongate member formed from a single resilient and flexible material.

[0017] When in the erected condition the structure defines an internal cavity 8 which acts as a play, accommodation and/or storage area.

[0018] In Figure 1c there is illustrated a variation of the

structure of Figure 1b and in this case the frame members 6 are each formed of first and second portions 6a, 6b. The portions can be moved and held in a locked position via locking means 7 so as to allow the structure to take the form shown in Figure 1c. However, when the structure is to be provided in the storage position shown in Figure 1a, then, and especially if the structure is of a relatively large size such as an accommodation structure, there is often a need for the length of the frame members to be reduced. This can be achieved by releasing the locking means 7 and then, in one embodiment, pivotally moving the said portions as indicated by arrow 9 or, in another embodiment, linearly moving the portions 6a, b telescopically, as shown by arrow 11, to thereby allow the frame members to be reduced in length for storage purposes.

[0019] In accordance with the invention, the structure can be manipulated between the storage and erected conditions by user manipulation of location means 10 located at the peak of the structure. Two forms of location means are now described in more detail with the sheet material removed for ease of illustration.

[0020] Referring firstly to Figures 2a-c there is illustrated a location means 10 of a first embodiment. The location means include a base 12 with which the ends 14 of respective frame members 6 are located. Also provided is a movement means 16 which can be manipulated by a user to be moved in a linear direction 18 and rotational direction 20 along and about axis 22 for purposes which will now be described.

[0021] Cross sectional elevations along the axis 22 are shown in Figures 2a and b and illustrate the location means in position, in Figure 2b when the structure is erected, and in Figure 2c when the structure is in the storage condition. It will be seen that at the ends 14 of the frame members 6 there is provided a series of teeth 24 in an arc which are provided to engage with teeth 26 on a member 28 provided as part of the movement means 16. A comparison of Figures 2b and c shows that the movement means 16 and hence member 28 is relatively linearly movable with respect to the base 12 along axis 22. This movement causes relative movement of the meshed teeth 24,26 and so, when the movement means is in the position shown in Figure 2b relative to the base, the frame members are moved to a position in which the ends 14 are substantially perpendicular to the axis 22 and the action of the sheet material causes the frame members to bend towards the opposing ends of the same so as to move the structure to the erected condition shown in Figure 1b. When the movement means 14 is in the position as shown in Figure 2c with respect to the base 12 this causes the frame members 6 to move to a position substantially in line with the axis 22 and so the structure is moved to the storage condition.

[0022] Typically the movement means 16 can also be rotated about the axis 22 to prevent movement of the movement means and thereby lock the structure in one of the storage or erected conditions until the movement means is rotated back to a release position.

[0023] Figures 3a and b illustrate an alternative embodiment of the location means and in this case the movement means 116 are connected to be relatively moveable to the base 112 via screw thread 142 provided on an elongate member 144 provided as part of the movement means 116 and an aperture 146 provided in the base 112. The frame members 106 are provided with their ends 114 located with the base 112. The movement means also includes gripping means 148 located at the end of the elongate member 144. A cross section along the axis of rotation 122 is shown in Figure 3b with the structure in an erected condition. A plate 150 is also provided and the operation of this location means is now described.

[0024] In order to move the structure from the storage condition to the erected condition, the gripping portion 148 is pulled and then turned and this acts to move the plate 150 upwardly towards the base 112 and is it does so it pushes the end portions 114 and hence the frame members 106 upwardly and the restriction of the sheet material causes the frame members to splay outwardly. When fully erected a spigot pin 152 moves under a biasing force to lock the elongate member 144 in position to lock the mechanism. To move the structure to the storage condition a release mechanism is first pressed downwardly to release the spigot pin and the elongate member 144 can be rotated to move the plate 150 and frame members 106 downwardly.

Claims

1. A structure including sheet material supported by and connected to a series of frame members, said frame members each connected to a common location means, wherein said location means includes a base to which the frame members are connected and movement means associated with the base, such that relative movement of the movement means and base allows the frame members, and hence the sheet material, to move between the storage and erected conditions, said movement means actuable by a user and including locking means to allow the structure to be locked in at least the erected condition.
2. A structure according to claim 1, wherein the relative movement includes a linear movement component and which linear movement causes the frame members to be moved between the storage and erected conditions.
3. A structure according to claim 1, wherein once the frame members have been moved to the erected condition, rotational movement of said movement means allows a locking of the frame members in the erected condition.
4. A structure according to claim 1, wherein the relative movement includes a rotational movement component of the movement means with respect to the base.
5. A structure according to claim 4, wherein said rotational movement is rotation about an axis which is substantially parallel with the frame members when the same are in the storage condition.
6. A structure according to claim 1, wherein there is provided a mechanical drive connection between the frame members and the base.
7. A structure according to claim 1, wherein there is provided a mechanical drive connection between the frame members and the movement means.
8. A structure according to claim 1, wherein the location means is mounted with respect to the structure such that the same forms a peak of the structure when it is erected.
9. A structure according to claim 1, wherein the frame members are formed from two or more portions which are relatively movable to allow the same to be moved to a reduced length storage position.
10. A structure according to claim 9, wherein the relative movement is achieved by relative pivotal movement of the two or more portions and/or relative linear movement.
11. A structure according to claim 1, wherein the shape and/or movement of the frame members is constrained by the location of the same with the sheet material.
12. A structure according to claim 11, wherein the said location is achieved by passing each frame member along an envelope formed by the sheet material or by passing the same through a series of loops at spaced intervals.
13. A structure according to claim 1, wherein the frame members, typically via an end which opposes a second end at the location means, is prevented from moving in a substantially linear direction away from the location means.
14. A structure according to claim 1, wherein the location means is provided as an assembly which is located with, and supported by, the frame members.
15. A structure according to claim 14, wherein the location means is actuated from externally of the structure when the same is in both storage and erected conditions.

16. A method of moving a structure between erected and storage conditions, said structure including sheet material supported by, and connected to, a series of frame members, said method comprising the steps of connecting said frame members to a common location means, wherein said location means includes a base to which the frame members are connected and movement means associated with the base such that relative movement of the movement means and base allows the frame members, and hence the sheet material, to move between the storage and erected conditions, said movement means actuatable by a user and including locking means to allow the structure to be locked in at least the erected condition.

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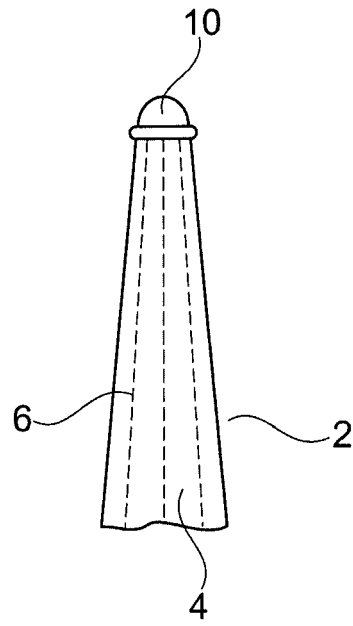


Fig. 1a

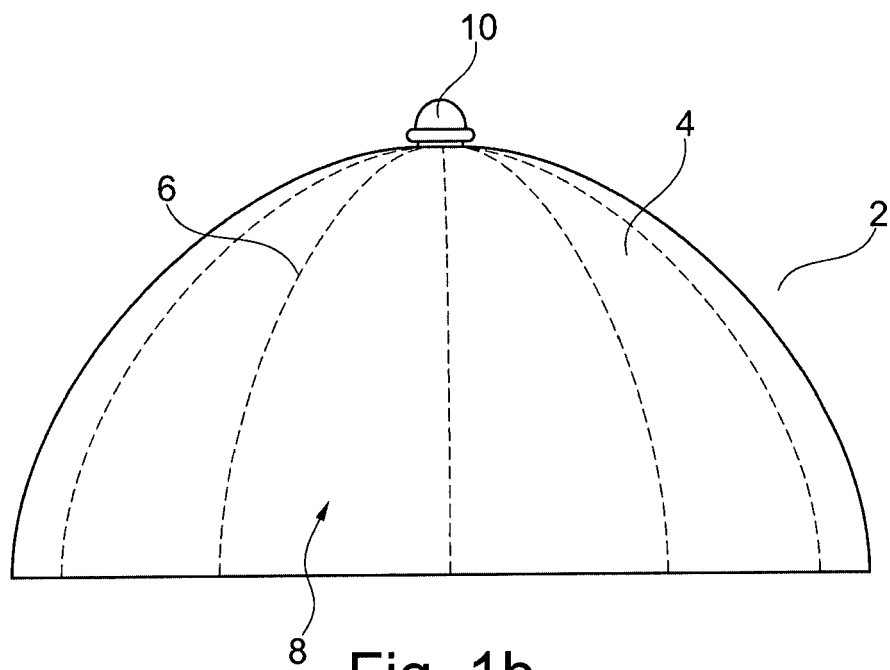


Fig. 1b

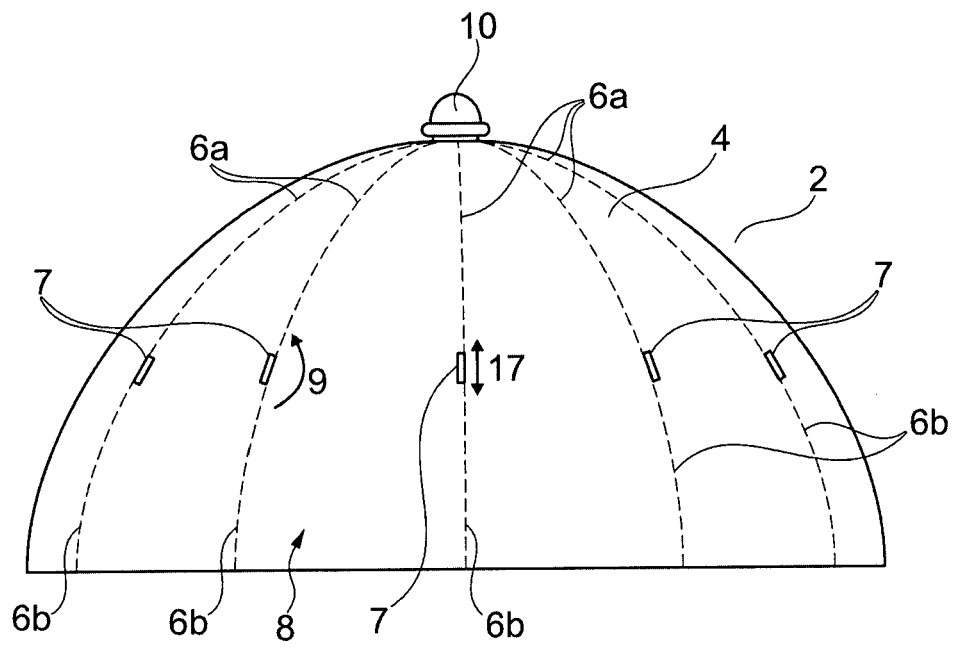


Fig. 1c

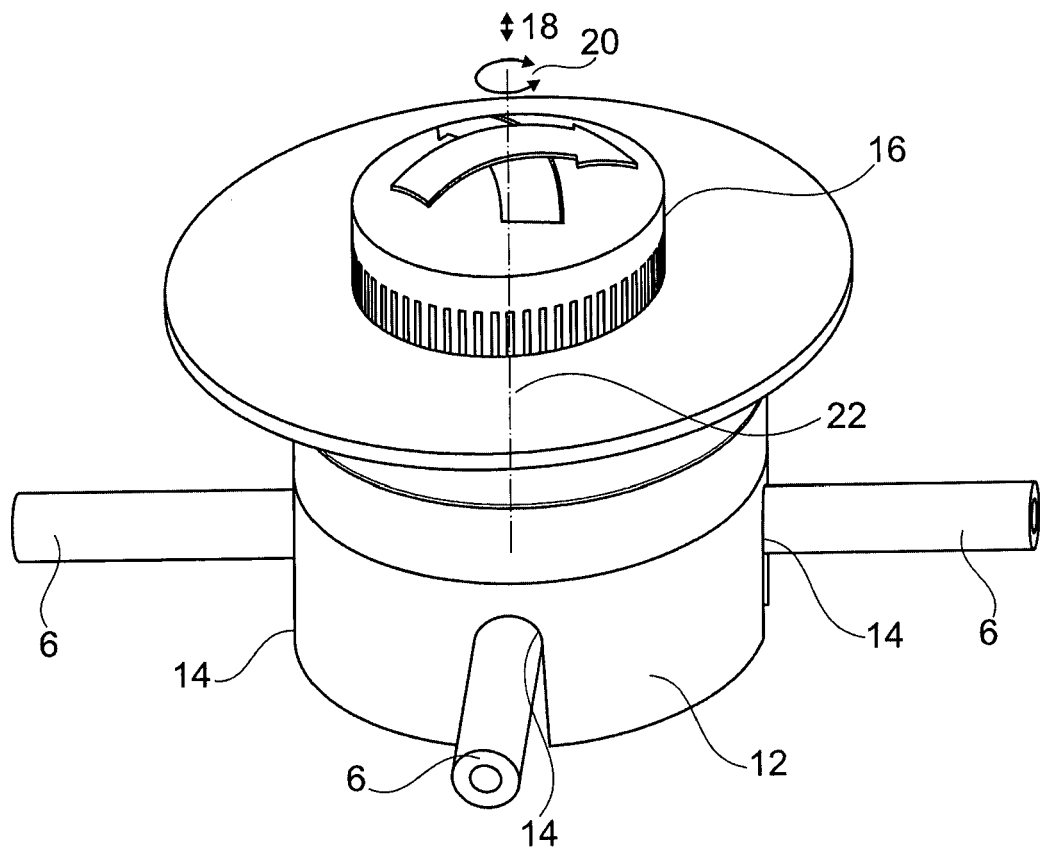


Fig. 2a

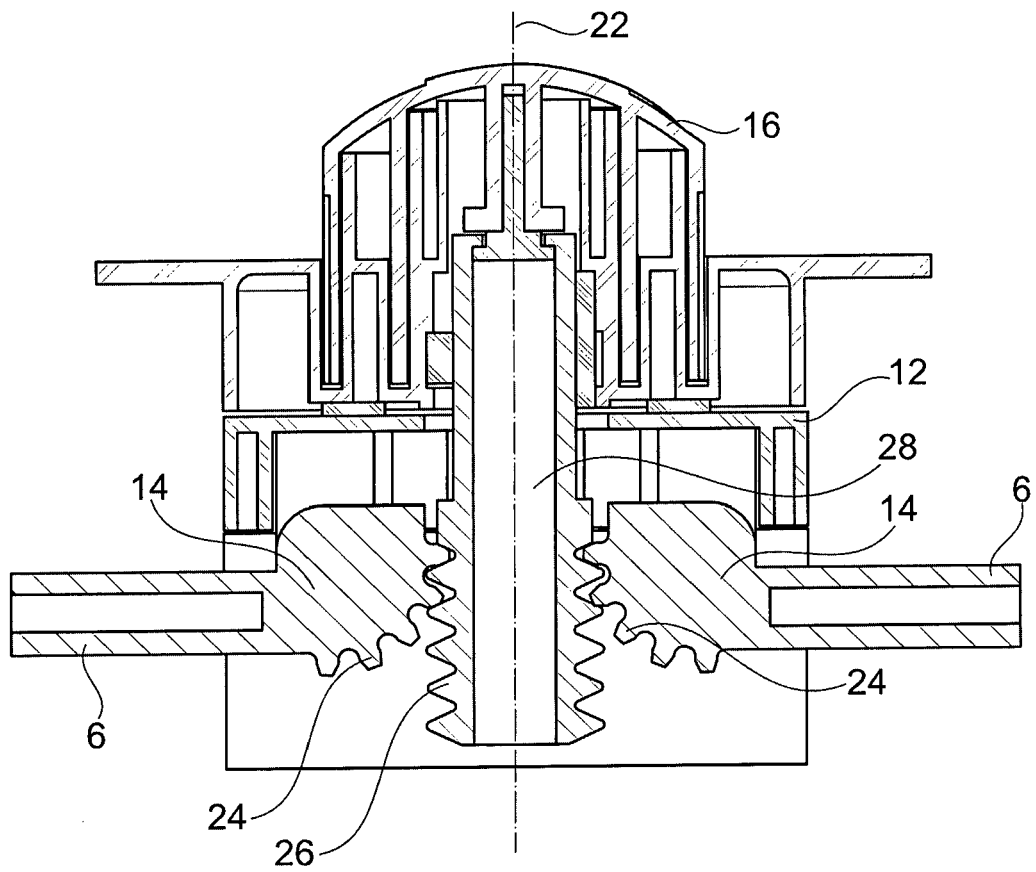


Fig. 2b

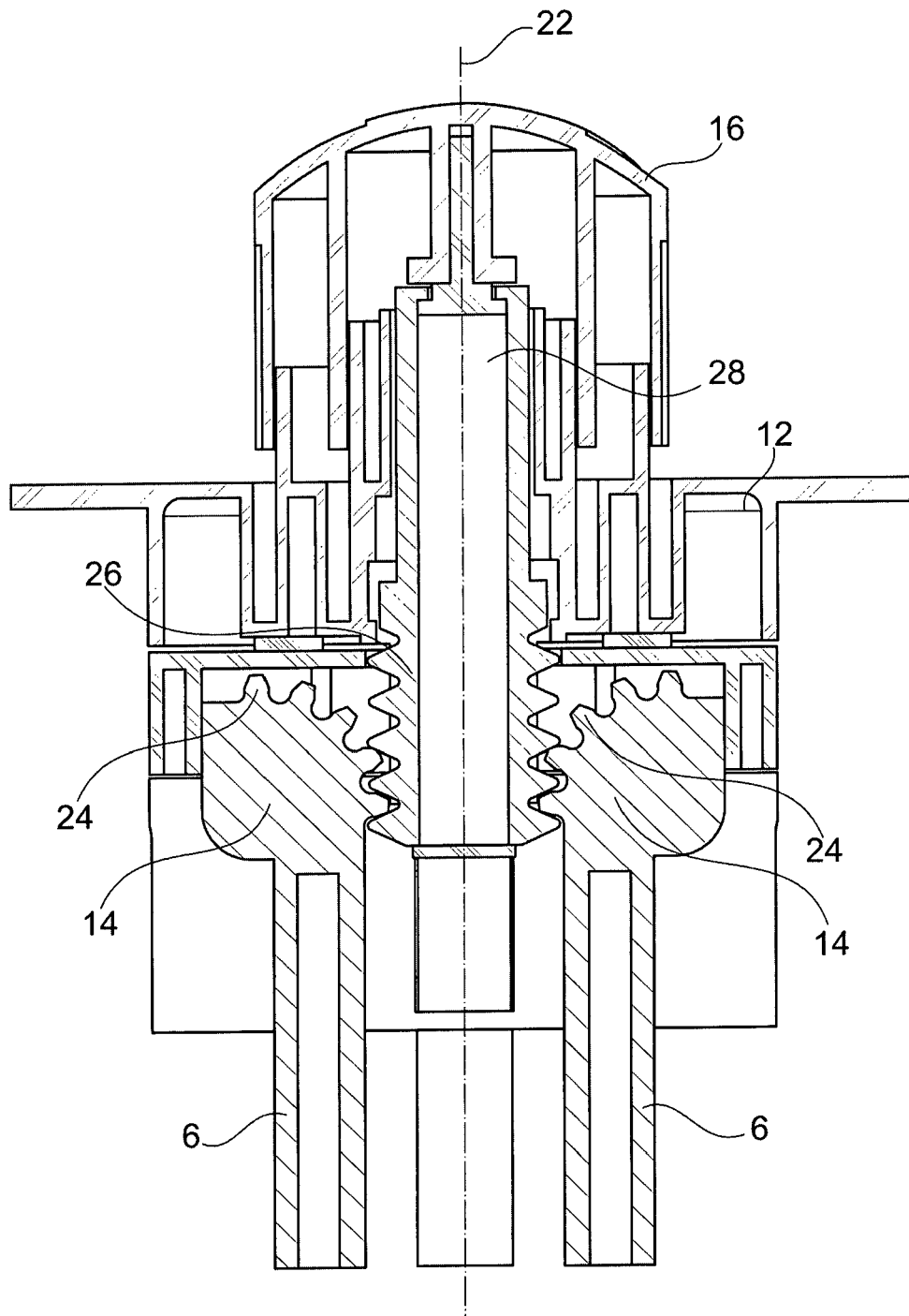


Fig. 2c

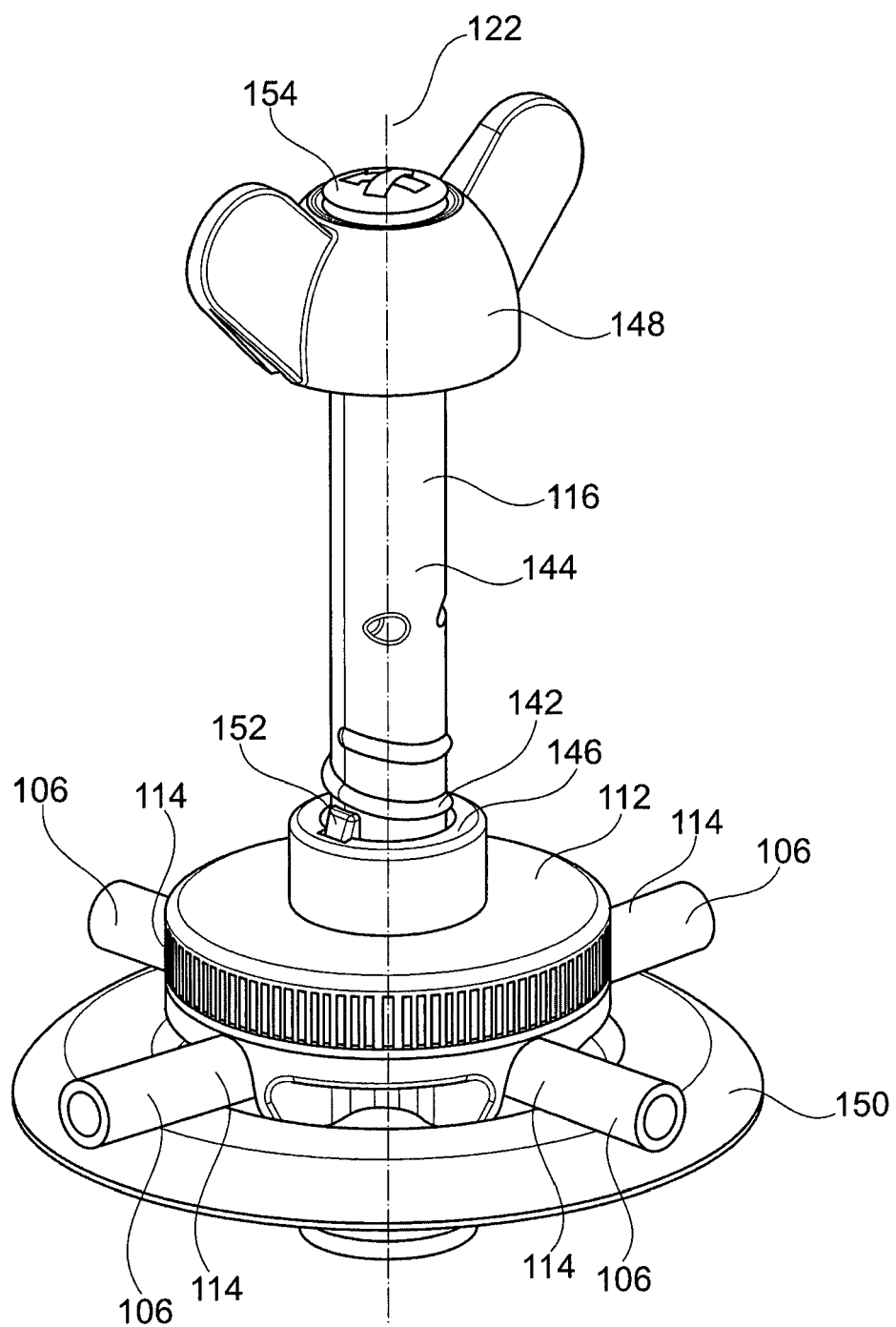


Fig. 3a

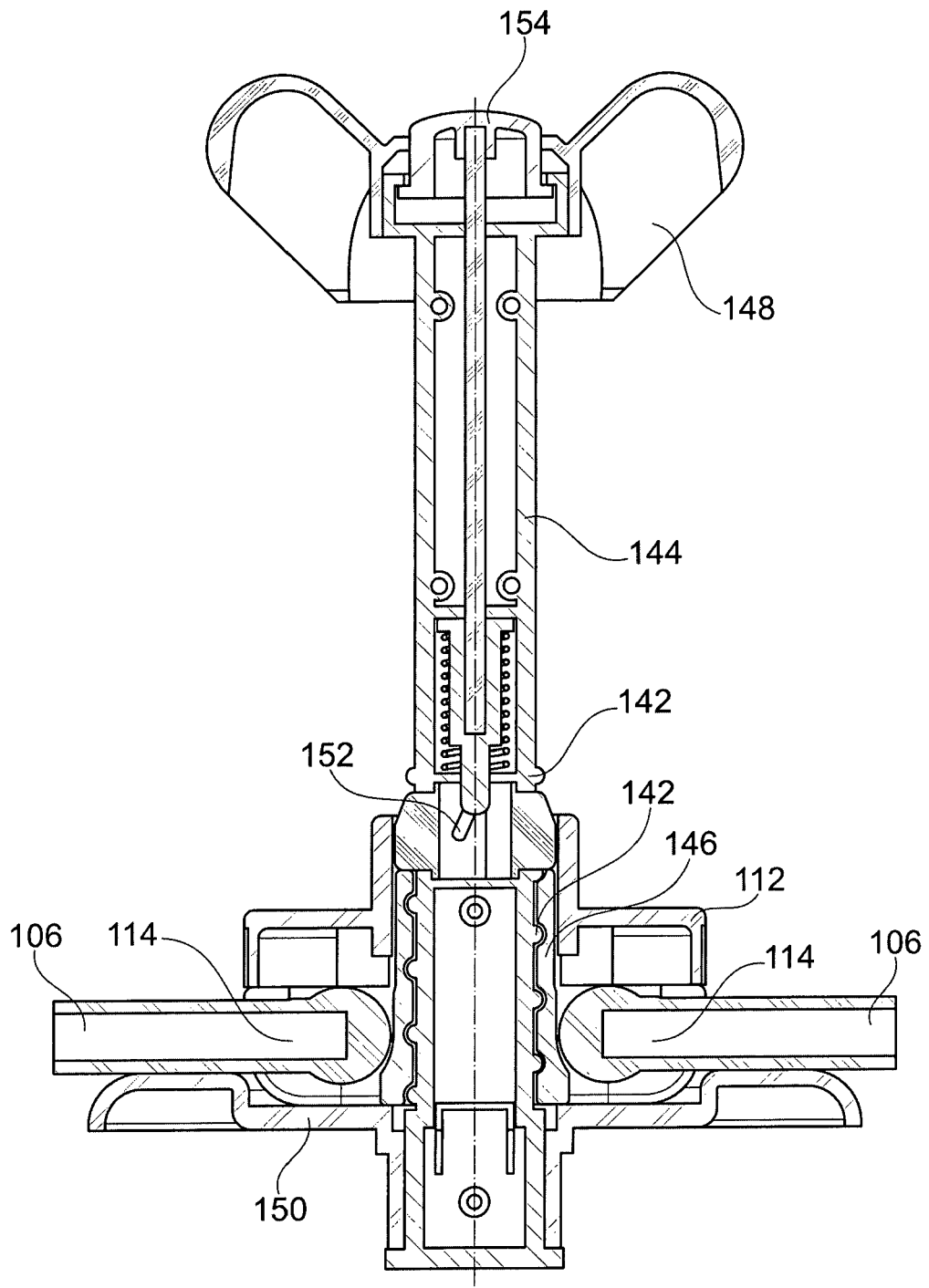


Fig. 3b



EUROPEAN SEARCH REPORT

Application Number
EP 15 18 0949

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 816 286 A2 (HARDY & GREYS LTD [GB]) 8 August 2007 (2007-08-08) * paragraphs [0013] - [0017]; claims 1-9; figures 1-6 *	1-16	INV. E04H15/28
X	CA 1 281 607 C (FOURNIER, A.) 19 March 1991 (1991-03-19) * page 2 - page 4; claims 1,9; figures 1-5 *	1-16	
X	WO 2014/094253 A1 (XIAMEN RONGXINGWANG CAMPING APPLIANCE CO LTD [CN]) 26 June 2014 (2014-06-26) * abstract; figures 1-5 *	1-16	
X	US 2 953 145 A (MOSS CHARLES W ET AL) 20 September 1960 (1960-09-20) * column 2, line 8 - column 4, line 5; figures 1-9 *	1-16	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 12 January 2016	Examiner Decker, Robert
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 15 18 0949

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1816286	A2	08-08-2007	NONE
CA 1281607	C	19-03-1991	NONE
WO 2014094253	A1	26-06-2014	NONE
US 2953145	A	20-09-1960	NONE

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