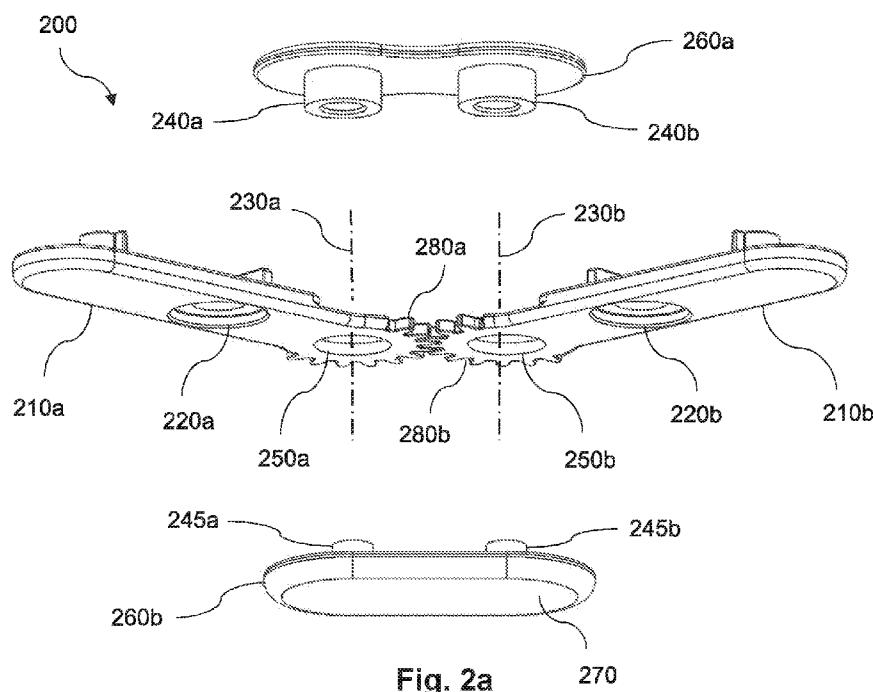




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(54) Title: HINGE ARRANGEMENT



(57) **Abstract:** A hinge arrangement (200) for rotatably connecting a first member to a second 5 member, the hinge arrangement comprising a first arm (210a) configured to be attached to the first member and rotate about a first axis (230a), a second arm (210b) configured to be attached to the second member and rotate about a second axis (230b), and a hinge housing (260) configured to cover a first shaft (240a) corresponding to the first axis and a second shaft (240b) corresponding to the 10 second axis, wherein at least part of the hinge housing is configured to act as a foot (260b, 100) for the first and second members.

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HINGE ARRANGEMENT

Technical field

5 This disclosure relates to hinge arrangements.

Background

10 In urban society, there is an increasing need for utilizing office areas as efficiently as possible. In homes, compact living has also become a trend, especially in major cities, and there is an increasing need to utilize the living area in apartments as efficiently as possible.

15 Foldable room dividers are often used this purpose, to allow for flexible and efficient usage of the overall space. Such room dividers are typically made up of a number of panels attached side-by side. An example of such a room divider is described in US 4,310,995. Panel systems for room dividers are well known in the art. Panels can be assembled in different configurations, which allow different types of room divider to be implemented. For example, panels may be assembled in a zig-zag, a U-shape, or other
20 configurations. Panels in such a room divider system may be joined by hinges to enable these different configurations.

However, currently known hinges can cause damage to the floor on which the system rests during rearrangement. Such hinges do not allow easy rearrangement of the
25 panels, which can lead to instability of the final arrangement. Furthermore, such hinges include complex interacting parts that are exposed, and therefore have a danger that a user's fingers may be caught in the working parts of the hinge mechanism. An example is shown in FR2605660A, which discloses partitioning systems comprising a succession of panels assembled in a chain and articulated together by connecting rods.

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A solution is therefore required that addresses at least some of these issues.

Summary

35 This present disclosure attempts to solve the problems noted above by providing a hinge arrangement including a hinge housing that acts as a foot for the system. The

hinge housing may also be used to locate the axes of rotation of a pair of hinge arms, and therefore maintain the relative position of adjacent panels.

The hinge housing may be configured to locate two rotation shafts. The first shaft corresponds to an axis or rotation of a first arm and the second shaft corresponds to an axis or rotation of a second arm. The hinge housing may be configured to maintain a fixed distance between the first and second axes, such that the relative position of adjacent panels is maintained.

The hinge housing also acts as a foot, meaning that no separate feet are required. The hinge housing can be formed such that it does not damage the floor during rearrangement of the panels. For example, the hinge housing may be flat or dome-shaped to ensure it glides across the floor when it is moved. The hinge housing may be formed of plastic, such that it does not damage the floor during movement.

The hinge arrangement comprises a set of interacting teeth, which causes the panels to turn in tandem and reduces the tendency for two panels to wobble in relation to each other. This also provides a rotation or turning range of each panel up to 180°, which enables a number of different panel configurations to be adopted. The hinge housing encloses the moving parts of the hinge, which prevents a user's fingers being pinched in the mechanism and means that these parts cannot be accessed or damaged. Furthermore, as the hinge housing maintains a fixed distance between the shafts and a vertical alignment of the arms, the two sets of teeth are kept in contact with each other, which provides tolerances for panels of different heights without comprising the functionality of the hinge arrangement.

The hinge arrangement can be applied at the top and bottom of adjacent panels, rather than at intermediate positions along the length of the panels. This provides a simple arrangement, as the panels are only joined at two places, and further ensures that the panels turn in tandem to reduce the tendency for the panels to wobble.

The hinge arrangement is formed to be of low overall thickness, so that only a narrow gap is formed between the panels and the floor. Furthermore, this low thickness means that the hinge arrangement can be placed on the top or bottom of the panels, so that no cut-out is required in the panels to receive the hinge. The arms of the hinge arrangement may have a varying thickness, which provides tolerances for deviations in the length of panels or an uneven floor.

According to an aspect, there is provided a hinge arrangement for rotatably connecting a first member to a second member, the hinge arrangement comprising a first arm configured to be attached to the first member and rotate about a first axis, a second arm configured to be attached to the second member and rotate about a second axis, and a hinge housing configured to cover a first shaft corresponding to the first axis and a second shaft corresponding to the second axis, wherein at least part of the hinge housing is configured to act as a foot for the first and second members.

Optionally, the hinge housing is configured to locate the first shaft and the second shaft. Optionally, the hinge housing is configured to maintain a fixed distance between the first and second shafts. Optionally, the hinge housing comprises the first and second shafts.

Optionally, the hinge housing comprises a first cover element configured to be assembled on an upper side of the first and second arms, and a second cover element configured to be assembled on a lower side of the first and second arms. Optionally, the second cover element is configured to act as a foot for the first and second members. Optionally, at least one of the first and second cover elements comprises at least part of at least one of the first and second shafts, preferably at least a part of each of the first and second shafts. Optionally, at least one of the first and second cover elements comprises first and/or second locating studs configured to be received by the first and/or second shafts respectively. Preferably, the first or second cover element comprises the first and second shafts, and the other of the first and second cover elements comprises the first and second locating studs.

Optionally, the part of the hinge housing configured to act as a foot has a smooth surface configured to slide on a floor. Optionally, the part of the hinge housing configured to act as a foot is flat or dome-shaped.

Optionally, each arm comprises a set of teeth configured to interact with the set of teeth of the other arm, such that the first and second members are caused to turn in tandem. Optionally, the hinge housing is configured to at least partially enclose the teeth of the first and second arms. Optionally, the hinge housing is configured to maintain contact between the sets of teeth.

Optionally, each arm has a first thickness t_1 towards an attachment end, and a second t_2 thickness towards an axis end, wherein the second thickness t_2 is less than the first thickness t_1 . Optionally, the first thickness t_1 is less than 10mm, and is preferably 3.5-6 mm. Optionally, the second thickness t_2 is less than 3.5mm, and is preferably 1.5-3 mm. Optionally, the thickness t_3 of the arrangement is less than 15mm, preferably less than 12mm, and more preferably is 6-10mm.

Optionally, the hinge arrangement is further configured to be mounted on substantially flat lower surfaces of the first and second members. Optionally, the first and second members are respectively first and second panels of a room divider system.

Optionally, the part of the hinge housing configured to act as a foot is made of plastic. Optionally, the entire hinge housing is made of plastic. Optionally, the first and second arms are made of plastic.

Optionally, each arm is configured to rotate in a range of 180° about its respective axis.

According to an aspect, there is provided a room divider system comprising a first panel, a second panel, and a hinge arrangement, the hinge arrangement being a first hinge arrangement configured to rotatably connect the first panel to the second panel and to function as a foot for the room divider system. Optionally, the first hinge arrangement is mounted on substantially flat lower surfaces of the first and second panels. Preferably, when the room divider system is mounted on a floor, the distance t_4 between the substantially flat lower surfaces of the first and second panels and the floor is less than 15mm, preferably less than 12mm, and more preferably is 6-10mm. Optionally, the hinge arrangement is configured to be mounted to a connector of the first panel and/or to a connector of the second panel. Optionally, the room divider system further comprises a second hinge arrangement mounted on substantially flat upper surfaces of the first and second panels. Preferably the first hinge arrangement and the second hinge arrangement are of identical design.

Brief Description of the Drawings

Exemplary embodiments of the disclosure shall now be described with reference to the drawings in which:

Fig. 1a shows a room divider system arranged in a zig-zag configuration;

Fig. 1b shows a room divider system arranged in a U configuration;

Fig. 2a shows an exploded view of a hinge arrangement according to an embodiment;

Fig. 2b shows an assembled view of a hinge arrangement according to an embodiment;

Fig. 2c illustrates a bottom view of a hinge arrangement mounted to first and second members;

Fig. 2d shows a cross-sectional view of a hinge arrangement mounted to first and second members;

Figs. 3a to 3f show a hinge arrangement with arms oriented at a series of different angles; and

FIG. 4 shows an example panel of a room divider system;

Throughout the description and the drawings, like reference numerals refer to like parts.

Detailed Description

Figs. 1a and 1b show a room divider system 100 comprising a number of panels 110a-c. The panels 110a-c are attached side-by-side to provide a foldable room divider system. That is to say, the panels 110a-c can be turned to provide different configurations, which allow different types of room divider effects to be implemented. Fig. 1a shows the room divider system 100 arranged in a zig-zag configuration. Fig. 1b shows the room divider system 100 arranged in a U configuration. It will be appreciated that other configurations of the panels 110a-c are possible. Figs. 1a and 1b show three panels 110a-c connected such that they together form a room divider system 100. It is to be understood that any number of panels 110 could be connected to each other, including two panels, three panels, and more than three.

The panels 110a-c in the room divider system 100 may be joined by hinges to enable these different configurations. Figs. 1a and 1b show hinge arrangements 200 provided between adjacent panels. The hinge arrangements 200 are configured to rotatably connect adjacent panels, such that the panels can be turned relative to each other to provide different room divider configurations. The hinge arrangements 200 may be provided at both the top and the bottom of the interface between adjacent panels. In the embodiments of Figs. 1a and 1b, a first hinge arrangement 200a is provided at the top of the interface between the first and second panels 110a-b, and a second hinge arrangement 200b is provided at the bottom of the interface between the first and

second panels 110a-b. Also, a third hinge arrangement 200c is provided at the top of the interface between the second and third panels 110b-c, and a fourth hinge arrangement 200d is provided at the bottom of the interface between the second and third panels 110b-c. Whilst hinge arrangements 200 are shown at both the top and bottom of the interface between adjacent panels in these configurations, it will be appreciated that hinge arrangements 200 could be provided only at the top or only at the bottom of an interface to provide the required hinge functionality.

An exploded view of a hinge arrangement 200 is shown in Fig. 2a. The hinge arrangement 200 is configured to provide a hinged connection between two members. For example, the hinge arrangement 200 may provide a hinged connection between two adjacent panels of a room divider system, such as the room divider system 100. Whilst the present disclosure relates principally to room divider systems, it will be appreciated that the disclosed hinge arrangement 200 is also able to provide a hinged connection in other implementations, for example a door, a cupboard, wardrobe, a window and the like.

The hinge arrangement 200 comprises two arms 210a-b. The first arm 210a is configured to be attached to a first member, for example a first panel of a room divider system, and the second arm 210b is configured to be attached to a second member, for example a second panel of a room divider system. The hinge arrangement 200 may be configured to be mounted on substantially flat upper or lower surfaces of the first and second members. Each arm 210a-b may comprise an aperture 220a-b configured to receive a fastener, such as a screw or bolt, for attachment to the respective member. The aperture 220a-b may be a recessed aperture, such that the fastener is flush with the surface of the arm 210a-b when attached. According to alternative embodiments, for example when there is no need to have the possibility of detaching the arms 210a-b from their respective members, the arms 210a-b may be attached to the members by an adhesive and/or by ultrasonic welding. In some embodiments, the arms 210a-b of the hinge arrangement 200 could be pre-mounted to respective members, which means the room divider 100 is ready for use when purchased by the end-user. In other embodiments, the hinge arrangement 200 may be provided separately to the members for user assembly.

Each arm 210a-b is configured to rotate about its own respective axis 230a-b. To enable this rotation, a shaft 240a-b is provided corresponding to each axis 230a-b. In some embodiments, the shafts 240a-b are configured to interact with corresponding apertures

250a-b in the arms 210a-b. The shafts 240a-b may also interact with locating studs 245a-b, as discussed below. In other embodiments, the shafts 240a-b could be provided as part of the arms 210a-b themselves. Each arm 210a-b is configured to rotate in a range of 180° about its respective axis, as will be explained in relation to Figs. 3a-f.

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A hinge housing 260 is configured to cover the shafts 240a-b, as will be explained in relation to Fig. 2b. In some embodiments, the shafts 240a-b are provided as part of the hinge housing 260. However, as discussed above, it will be appreciated that the shafts 240a-b could be provided as part of the arms 210a-b themselves. In some
10 embodiments, the shafts 240a-b could be provided as separate elements entirely.

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As well as covering the shafts 240a-b, the hinge housing 260 may be configured to locate the shafts 240a-b in their respective positions. This ensures that a fixed distance is maintained between the shafts 240a-b, and therefore the axes 230a-b. To achieve
this, in some embodiments, the shafts 240a-b are connected to or part of the hinge housing 260 and configured to interact with the apertures 250a-b. In other
embodiments, for example where the shafts 240a-b are provided as part of the arms 210a-b or as separate elements, the hinge housing 260 may comprise one or more
recesses configured to receive each shaft and locate the shafts 240a-b in their
20 respective positions.

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In some embodiments, the hinge housing 260 comprises a first cover element 260a and a second cover element 260b configured to be assembled on opposite sides of the arms 210a-b. For example, as shown in Fig. 2a, the first cover element 260a is configured to
25 be assembled on an upper side of the arms 210a, 210b and the second cover element 260b is configured to be assembled on a lower side of the arms 210a, 210b. The first cover element 260a and second cover element 260b may be joined using thermal welding, ultrasonic welding, an adhesive, and/or a fastener such as a screw or rivet. In some embodiments, the hinge housing 260 may be a unitary element, with spaces in a
30 side wall to allow rotational movement of the arms 210a-b.

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In the embodiment of Fig.2a, the shafts 240a-b are connected to or part of the hinge housing 260. In particular, the shafts 240a-b are connected to or part of the first cover element 260a. In this embodiment, the locating studs 245a-b are connected to or part
35 of the second cover element 260b, and are received in corresponding holes of the shafts 240a-b when the hinge arrangement is assembled. In this way, the shafts 240a, 240b can be considered as outer parts of an axle and the studs 245a, 245b can be considered

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as inner parts of the axle. The extreme ends of the shafts 240a-b may sit flush with an upper surface of the second cover element 260b. The length of the shafts 240a-b may be slightly larger than the thickness of the arms 210a-b in order to allow clean rotation of the arms 210a-b whilst maintaining the arms 210a-b in vertical alignment. It will be appreciated that, in other embodiments, the shafts 240a-b could be provided as part of the second cover element 260b and the locating studs 245a-b as part of the first cover element 260a. Alternatively, the first shaft 240a could be provided as part of the first cover element 260a and the second shaft 240b could be provided as part of the second cover element 260b (with the corresponding respective locating studs 245a-b on the opposite cover element), or vice versa.

As discussed above, the first cover element 260a and the second cover element 260b may be joined using thermal welding, ultrasonic welding, an adhesive, and/or a fastener such as a screw or rivet. In embodiments where the shafts 240a-b interact with locating studs 245a-b, the corresponding shafts 240a-b and locating studs 245a-b are joined together to provide the connection between the first cover element 260a and the second cover element 260b. For example, the extreme end of the shaft 240a may be joined to the base end of the locating stud 245a, such that the join does not interfere with rotation of the arm 210a. A particular advantage of this embodiment is that the shafts 240a-b function both as rotation points for the arms 210a-b and as a connection for the cover elements 260a, 260b of the housing 260.

At least part of the hinge housing 260 is configured to act as a foot. That is to say, when the hinge arrangement 200 is assembled on the first and second members, the assembly may be placed on the floor and rest on the hinge housing 260. This means that no separate feet are required in order to install the assembly in a room. In particular, the hinge housing 260 may comprise a foot surface 270. The foot surface 270 may be a smooth surface configured to slide or glide across a floor. This ensures that the floor is not damaged when the assembly is rearranged or moved across the floor. In some embodiments, the foot surface 270 may be substantially flat or dome-shaped.

In some embodiments, the foot surface 270 is made of plastic. In some embodiments, the foot surface 270 is part of the second cover element 260b of the hinge housing 260. In these embodiments, the second cover element 260b, or the entire hinge housing 260, may be made of plastic. Many plastics are suitable, including polyamide and polypropylene. Thermoplastics are often preferred as they enable the parts to be

welded together using thermal or ultrasonic welding. It is particularly advantageous if the plastic is flexible to provide tolerances in the assembly, and is not too brittle. This choice of material further ensures that the floor is not damaged when the assembly is rearranged or moved across the floor.

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Each arm 210a-b comprises a respective set of teeth 280a-b at an axis end. The teeth 280a-b are configured to rotate around the axis 230a-b of the respective arm 210a-b as the arm 210a-b rotates about the axis 230a-b. The teeth 280a-b of each arm 210a-b are configured to interact with the teeth 280a-b of the other arm 210a-b as the arms
10 210a-b rotate about their respective axes 230a-b. In this way, the arms 210a-b, and therefore the first and second members to which they are attached, are caused to rotate in tandem. This will be explained in relation to Figs. 3a-f. This reduces the tendency for the two members to wobble in relation to each other during turning. Furthermore, as the hinge housing 260 maintains a fixed horizontal distance between the shafts 240a-b and
15 a vertical alignment of the arms 210a-b, the two sets of teeth 280a-b are kept in contact with each other throughout rotation. This allows the hinge arrangement to provide tolerances for deviations in height of the members without compromising its functionality. For example, if two members have a nominal height of 2000mm, but in fact have respective heights of 1998mm and 2003mm, the hinge arrangement 200 is
20 still able to function properly.

Fig. 2b shows an assembled view of the hinge arrangement 200 shown in Fig. 2a. As can be seen from Fig. 2b, when the hinge arrangement 200 is assembled, the hinge housing 260 covers the shafts 240a-b and at least partially encloses the teeth 280a-b
25 of the first and second arms 210a-b. This restricts access to the working parts of the hinge arrangement 200, which prevents a user's fingers being pinched in the mechanism and reduces the risk that these parts are damaged.

The assembled hinge arrangement 200 is shown mounted to first and second members in Fig. 2c. The assembly is shown from below. In this case, the first and second members are first and second panels 110a-b of a room divider system 100, although it will be appreciated that the hinge arrangement 200 is also able to provide a hinged connection in other implementations. As can be seen from Fig. 2c, the hinge housing 260 covers the shafts 240a-b. The assembly can be placed on the floor and rest on the
35 hinge housing 260, in particular the foot surface 270.

Fig. 2d shows a cross-sectional view of a hinge arrangement 200 mounted to substantially flat lower surfaces of first and second members. The shafts 240a-b and the hinge housing 260 are shown with a hatched fill, to differentiate them from the arms 210a-b. In this case, the first and second members are first and second panels 110a-b of a room divider system 100. In particular, the first arm 210a of the hinge arrangement 200 is mounted on a lower surface 120a of a first panel 110a, and the second arm 210b of the hinge arrangement 200 is mounted on a lower surface 120b of a second panel 110b. A gap 130 may be maintained between the first and second panels 110a-b, in order to enable relatively free turning of the panels 110a-b relative to each other.

As can be seen in Fig. 2d, each arm 210a-b has a first thickness t_1 towards an attachment end, and a second thickness t_2 towards an axis end. In some embodiments, the second thickness t_2 is less than the first thickness t_1 . This variation in thickness provides tolerances for the case where the panels 110 are of different lengths, or where the assembly is placed on an uneven floor. In particular, the lower thickness t_2 allows for a certain flexibility and/or bendability of the arm, which is beneficial for handling different panel lengths and/or an uneven floor. In some embodiments, the first thickness t_1 is less than 10mm, preferably 3.5-6 mm, for example 4mm. In some embodiments, the second thickness t_2 is less than 3.5mm, preferably 1.5-3 mm, for example 2mm. This means that the distance between the first and second cover elements 260a-b is also around 2mm, which makes it difficult for a user's fingers to access the teeth 280a-b and be pinched or damage the mechanism.

The hinge arrangement 200 has a total thickness t_3 . In some embodiments, the total thickness t_3 of the arrangement 200 is less than 15mm, preferably less than 12mm, and more preferably is 6-10mm. As such, when the assembly of the hinge arrangement 200 and the first and second panels 110a-b is placed on a floor, the distance t_4 between the substantially flat lower surfaces 120a-b of the first and second panels 110a-b and the floor is also less than 15mm. This ensures that only a narrow gap is formed between the panels 110a-b and the floor, which allows the panels 110a-b to stand on the hinge arrangement 200 and still obtain a good room dividing function. Furthermore, this can be achieved without requiring a cut-out in the panels 110a-b to receive the hinge arrangement 200.

As discussed above, in a room divider system 100, hinge arrangements 200 may be provided at both the top and the bottom of the interface between adjacent panels. This provides a relatively simple arrangement, as the panels are only joined at two places

rather than at intermediate or elongate positions along the length of the panels. When the hinge arrangement is applied at the top and bottom of adjacent panels, it is further ensured that the panels turn in tandem such that the tendency for the panels to wobble is reduced. Due to the relatively low thickness of the hinge arrangement 200, a first hinge arrangement provided at the top of an interface and a second hinge arrangement provided at the bottom of an interface can be of identical design. The identical design helps to ensure the panels turn in tandem, as explained in relation to Figs. 3a-f.

Figs. 3a-f show a hinge arrangement 200 with arms 210a-b oriented at a series of different angles. For clarity of illustration, the second cover element 260b has been removed. Fig. 3a shows the arms 210a-b in a relatively parallel arrangement. As such, the angle between the arms 210a-b can be said to be 0° . When the hinge arrangement 200 is attached to first and second panels 110a-b of a room divider system 100, the panels 110a-b may be in a closed position.

Fig. 3b shows the arms 210a-b having been rotated from the closed position shown in Fig. 3a. As discussed above, the teeth 280a-b of each arm 210a-b are configured to interact with the teeth 280a-b of the other arm 210a-b such that the arms 210a-b are caused to rotate in tandem about their respective axes 230a-b. In this case, the arms 210a-b have each been rotated through an angle of 45° , and the angle between the arms 210a-b is therefore 90° . When the hinge arrangement 200 is attached to panels 110a-b of a room divider system 100 and the arms 210a-b are positioned in this way, the panels 110a-b may be arranged in one of a number of configurations, such as a zig-zag or a U configuration.

Fig. 3c shows the arms 210a-b having been further rotated from the position shown in Fig. 3b. In this case, the arms 210a-b have each been rotated through an angle of 60° , and the angle between the arms 210a-b is therefore 120° . When the hinge arrangement 200 is attached to panels 110a-b of a room divider system 100 and the arms 210a-b are positioned in this way, the panels 110a-b may be arranged in one of a number of configurations, such as a zig-zag configuration.

Fig. 3d shows the arms 210a-b having been further rotated from the position shown in Fig. 3c. In this case, the arms 210a-b have each been rotated through an angle of 90° , and the angle between the arms 210a-b is therefore 180° . When the hinge arrangement 200 is attached to panels 110a-b of a room divider system 100 and the arms 210a-b

are positioned in this way, the panels 110a-b may be arranged in a straight configuration, for example to provide an elongated wall.

Fig. 3e shows the arms 210a-b having been further rotated from the position shown in Fig. 3d. In this case, the arms 210a-b have each been rotated through an angle of 135° , and the angle between the arms 210a-b is therefore 270° (or 90° if considered from the other side). When the hinge arrangement 200 is attached to panels 110a-b of a room divider system 100 and the arms 210a-b are positioned in this way, the panels 110a-b may be arranged in one of a number of configurations, such as a zig-zag or a U configuration.

Fig. 3f shows the arms 210a-b again in a relatively parallel arrangement. In this case, the arms 210a-b have been rotated through an angle of 180° , and the angle between the arms 210a-b is therefore 360° (or 0° if considered from the other side). When the hinge arrangement 200 is attached to first and second panels 110a-b of a room divider system 100, the panels 110a-b may again be in a closed position.

As discussed above, the hinge arrangement 200 is configured such that a fixed distance is maintained between the axes of rotation 230a-b of the arms 210a-b, such that the relative position of adjacent panels 110 is maintained throughout turning. The hinge arrangement 200 causes the panels 110 to turn in tandem, which reduces the tendency for the panels 110 to wobble in relation to each other. The hinge arrangement 200 provides a rotation or turning range of each panel 110a-b up to 180° , which enables a number of different panel configurations to be adopted. A variation in thickness along the length of the arms 210a-b, and the maintenance of contact between the sets of teeth 280a-b, enables the hinge arrangement 200 to provide tolerances for the case where the panels 110 are of different lengths, or where the assembly is placed on an uneven floor.

Fig. 4 shows an example panel 110 of a room divider system 100, substantially as described in WO 2020/094837 and WO 2020/096521. The panel 110 preferably comprises a hollow board material. The hollow board material of the panel 200 may be produced as disclosed in WO 2012/048738, which is incorporated in its entirety by reference. The hollow board material comprises two parallel sheets 140, which may comprise lignocellulose fibres. Only a single sheet 140 is shown in Fig. 4. The sheets may be separated by a plurality of distance members (not shown) and at least one lath 150 arranged between the first and second sheets 140.

The lath 150 provides a rigid panel 110 allows for attachment of a connector 160. The connector 160 is configured to be attached to the lath 150 by means of a fastener 170, such as a screw. According to alternative embodiments, for example when there is no need to have the possibility of detaching the connector 160, the connector 160 may be attached to the lath 150 by an adhesive and/or by ultrasonic welding. The connector 160 forms a rigid structure for attaching associated equipment to the panel 110, as it is at least partially inserted in a cavity that is formed between the first and second sheets 140 of the panel 110 and then securely attached to a sidewall of the lath 150.

The hinge arrangements 200 discussed above should be securely attached to each panel 110. As discussed above, each arm 210 of the hinge arrangement 200 may comprise an aperture 220 configured to receive a fastener for attachment to a respective panel 110. The connector 160 may comprise a corresponding connection element 180. The connection element 180 is preferably a nut, but may just as well be any other type of connector or simply a thread arranged in the wall of the connector 160. The fastener may be a bolt 190 for connecting the arm 210 to the connection element 180. The connector 160 and the connection element 180 therefore serve as a connection point for mounting a hinge arrangement 200. Each panel 110 in the room divider system 100 may comprise a connector 160 for attachment of an arm 210a-b of the hinge arrangement 200.

It should be mentioned that the inventive concept is by no means limited to the embodiments described herein, and several modifications are feasible without departing from the scope of the appended claims. In the claims, the term “comprises/comprising” does not exclude the presence of other elements or steps. Additionally, although individual features may be included in different claims, these may possibly advantageously be combined, and the inclusion in different claims does not imply that a combination of features is not feasible and/or advantageous. In addition, singular references do not exclude a plurality. The terms “a”, “an”, “first”, “second” etc. do not preclude a plurality. Reference signs in the claims are provided merely as a clarifying example and shall not be construed as limiting the scope of the claims in any way.

Claims

1. A hinge arrangement (200) for rotatably connecting a first member to a second member, the hinge arrangement comprising:
 - 5 a first arm (210a) configured to be attached to the first member and rotate about a first axis (230a);
 - a second arm (210b) configured to be attached to the second member and rotate about a second axis (230b); and
 - a hinge housing (260) configured to cover a first shaft (240a) corresponding to the first axis and a second shaft (240b) corresponding to the second axis; wherein
 - 10 at least part of the hinge housing is configured to act as a foot (260b, 100) for the first and second members.
- 15 2. The hinge arrangement (200) of claim 1, wherein the hinge housing (260) is configured to locate the first shaft (240a) and the second shaft (240b).
3. The hinge arrangement (200) of claim 2, wherein the hinge housing (260) is configured to maintain a fixed distance between the first and second shafts (240a, 240b).
- 20 4. The hinge arrangement (200) of claim 2 or 3, wherein the hinge housing (260) comprises the first and second shafts (240a, 240b).
- 25 5. The hinge arrangement (200) of any preceding claim, wherein the hinge housing (260) comprises:
 - a first cover element (260a) configured to be assembled on an upper side of the first and second arms (210a, 210b); and
 - a second cover element (260b) configured to be assembled on a lower side
 - 30 of the first and second arms.
6. The hinge arrangement (200) of claim 5, wherein the second cover element (260b) is configured to act as a foot for the first and second members.
- 35 7. The hinge arrangement (200) of claim 5 or 6, wherein at least one of the first and second cover elements (260a, 260b) comprises at least part of at least one of the first and second shafts (240a, 240b).

- 5 8. The hinge arrangement (200) of claim 7, wherein at least one of the first and second cover elements (260a, 260b) comprises first and/or second locating studs (245a, 245b) configured to be received by the first and/or second shafts (240a, 240b) respectively.
- 10 9. The hinge arrangement (200) of any preceding claim, wherein the part of the hinge housing (260) configured to act as a foot (260b, 100) has a smooth surface configured to slide on a floor.
- 10 10. The hinge arrangement (200) of any preceding claim, wherein the part of the hinge housing (260) configured to act as a foot (260b, 100) is flat or dome-shaped.
- 15 11. The hinge arrangement (200) of any preceding claim, wherein each arm (210a, 210b) comprises a set of teeth (280a, 280b) configured to interact with the set of teeth of the other arm, such that the first and second members are caused to turn in tandem.
- 20 12. The hinge arrangement (200) of claim 11, wherein the hinge housing (260) is configured to at least partially enclose the teeth (280a, 280b) of the first and second arms (210a, 210b).
- 25 13. The hinge arrangement (200) of claim 11 or 12, wherein the hinge housing (260) is configured to maintain contact between the sets of teeth (280a, 280b).
- 30 14. The hinge arrangement (200) of any preceding claim, wherein each arm (210a, 210b) has a first thickness (t1) towards an attachment end, and a second thickness (t2) towards an axis end, wherein the second thickness is less than the first thickness.
- 35 15. The hinge arrangement (200) of claim 14, wherein the second thickness (t2) is less than 3.5mm, more preferably 1.5mm to 3mm, such as 2mm.
16. The hinge arrangement (200) of any preceding claim, wherein the total thickness (t3) of the hinge arrangement is less than 15mm, preferably less than 12mm, more preferably 6mm to 10 mm, such as 8mm.

17. The hinge arrangement (200) of any preceding claim, further configured to be mounted on substantially flat lower surfaces of the first and second members.
- 5 18. The hinge arrangement (200) of any preceding claim, wherein the first and second members are respectively first and second panels (110a, 110b, 110c) of a room divider system (100).
- 10 19. The hinge arrangement (200) of any preceding claim, wherein the part of the hinge housing (260) configured to act as a foot (260b, 100) is made of plastic, preferably wherein the entire hinge housing is made of plastic, and/or preferably wherein the first and second arms (210a, 210b) are made of plastic.
- 15 20. The hinge arrangement (200) of any preceding claim, wherein each arm (210a, 210b) is configured to rotate in a range of 180° about its respective axis (230a-b).
21. A room divider system (100) comprising:
a first panel (110a, 110b, 110c);
20 a second panel (110a, 110b, 110c); and
a hinge arrangement (200) as defined in any of claim 1 to 20, the hinge arrangement being a first hinge arrangement configured to rotatably connect the first panel to the second panel and to function as a foot for the room divider system.
- 25 22. The room divider system (100) of claim 21, wherein the first hinge arrangement (200) is mounted on substantially flat lower surfaces of the first and second panels (110a, 110b, 110c), preferably wherein, when the room divider system is mounted on a floor, the distance (t4) between the substantially flat lower surfaces of the first and second panels and the floor is less than 15mm, preferably less than 12mm, more preferably 6mm to 10 mm, such as 8mm.
- 30 23. The room divider system (100) of claim 21 or 22, wherein the hinge arrangement (200) is configured to be mounted to a connector (160) of the first panel (110a, 110b, 110c) and/or to a connector of the second panel (110a, 110b, 110c).
- 35

24. The room divider system (100) of any of claims 21 to 23, further comprising a second hinge arrangement (200) as defined in any of claim 1 to 20 mounted on substantially flat upper surfaces of the first and second panels (110a, 110b, 110c), preferably wherein the first hinge arrangement and the second hinge arrangement are of identical design.

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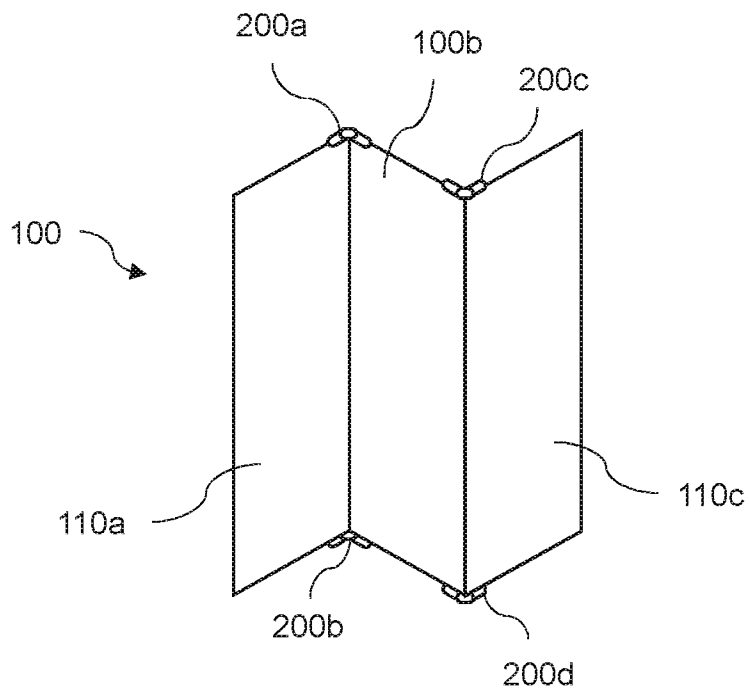


Fig. 1a

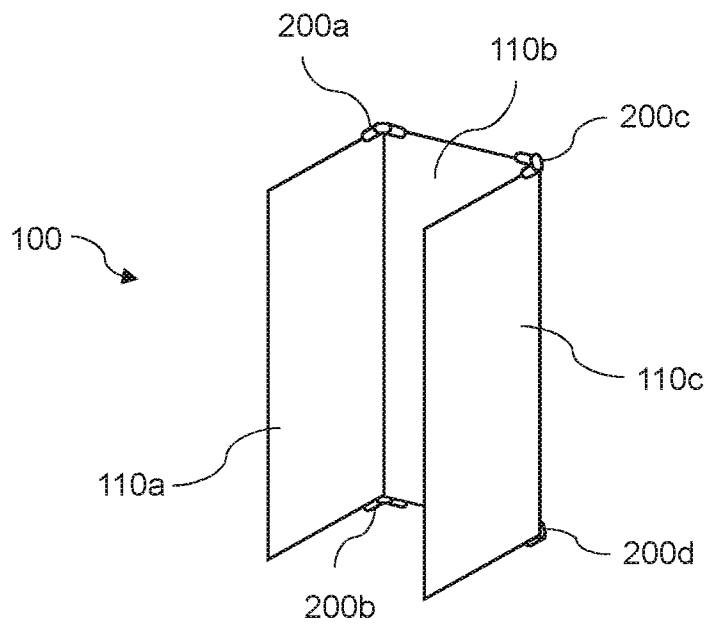
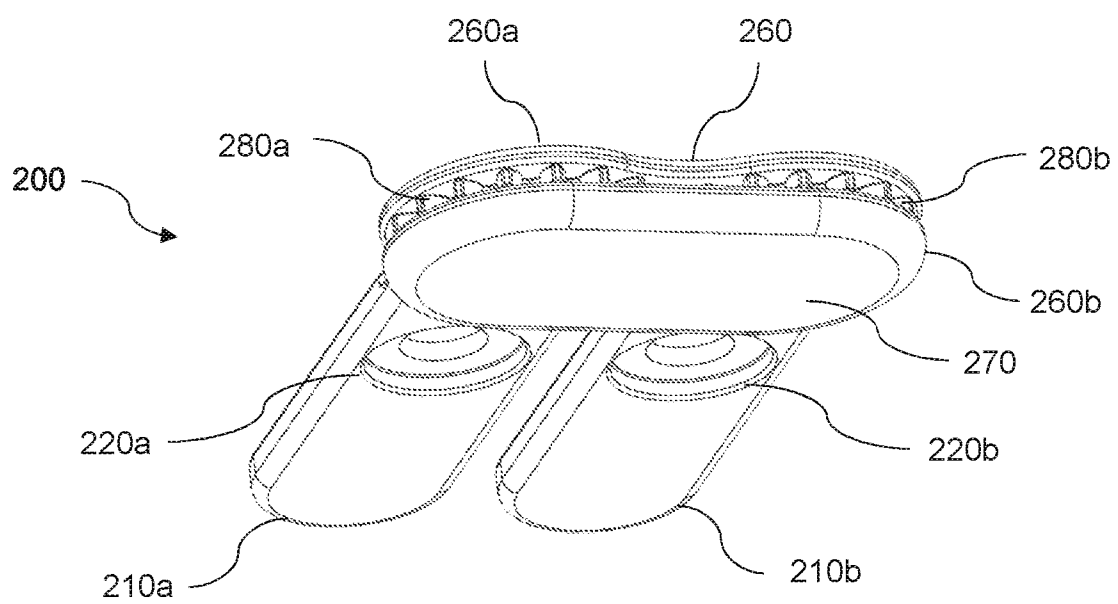
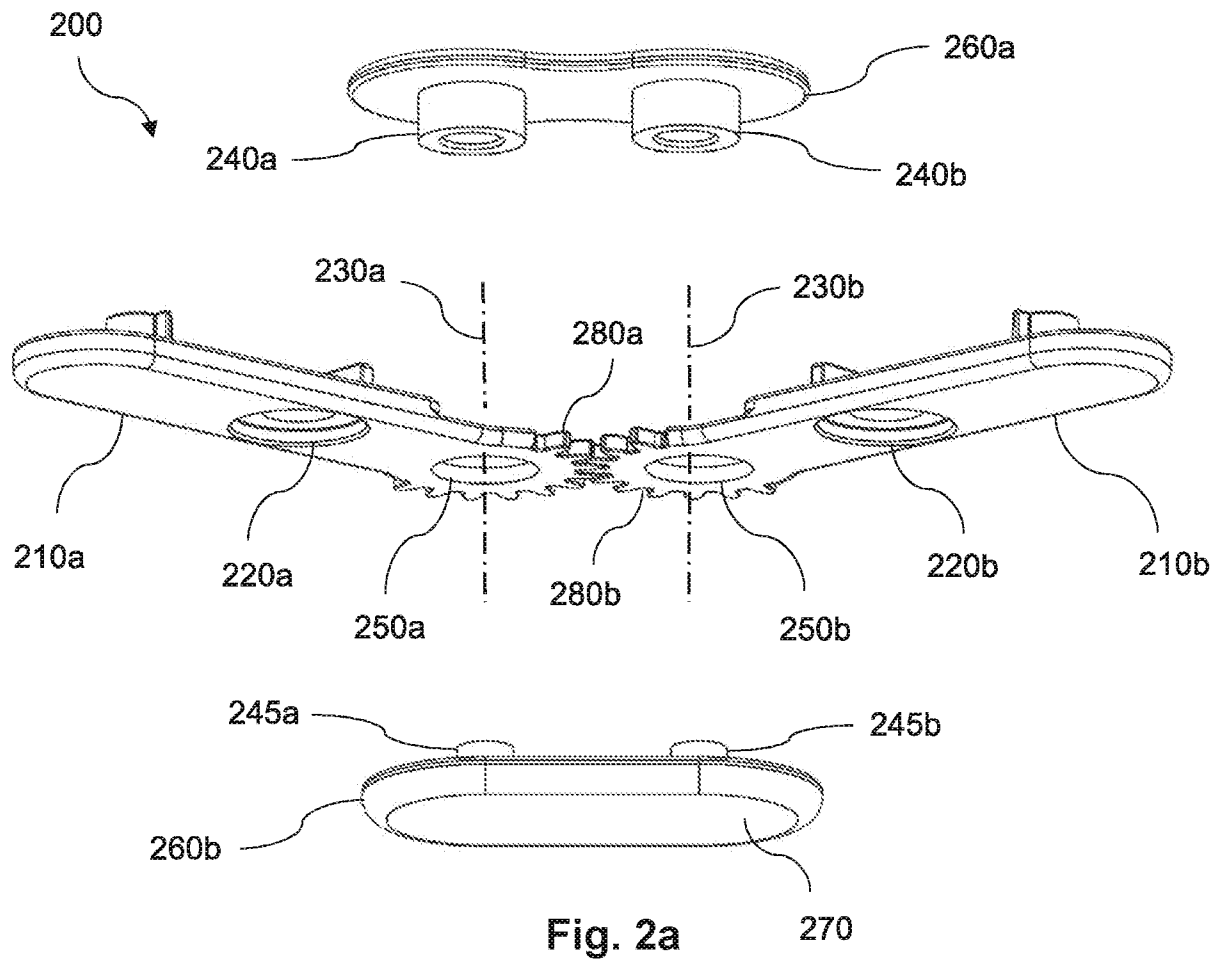


Fig. 1b

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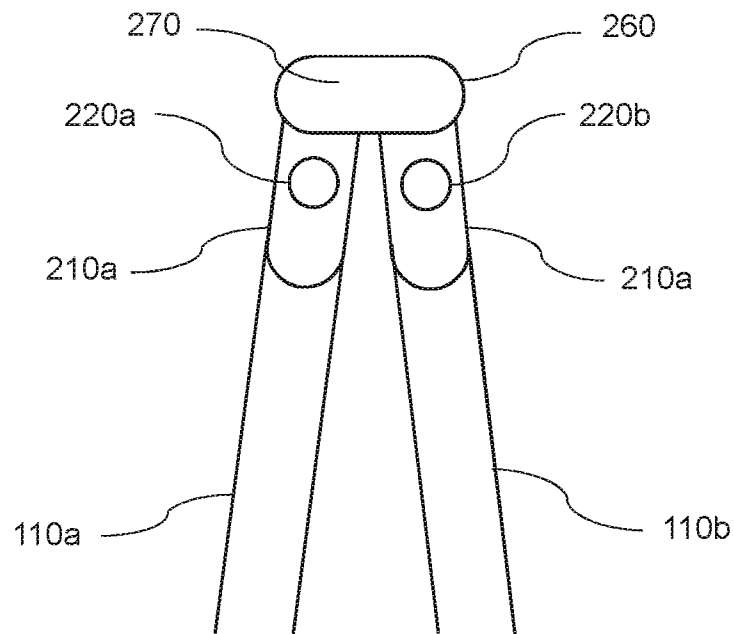


Fig. 2c

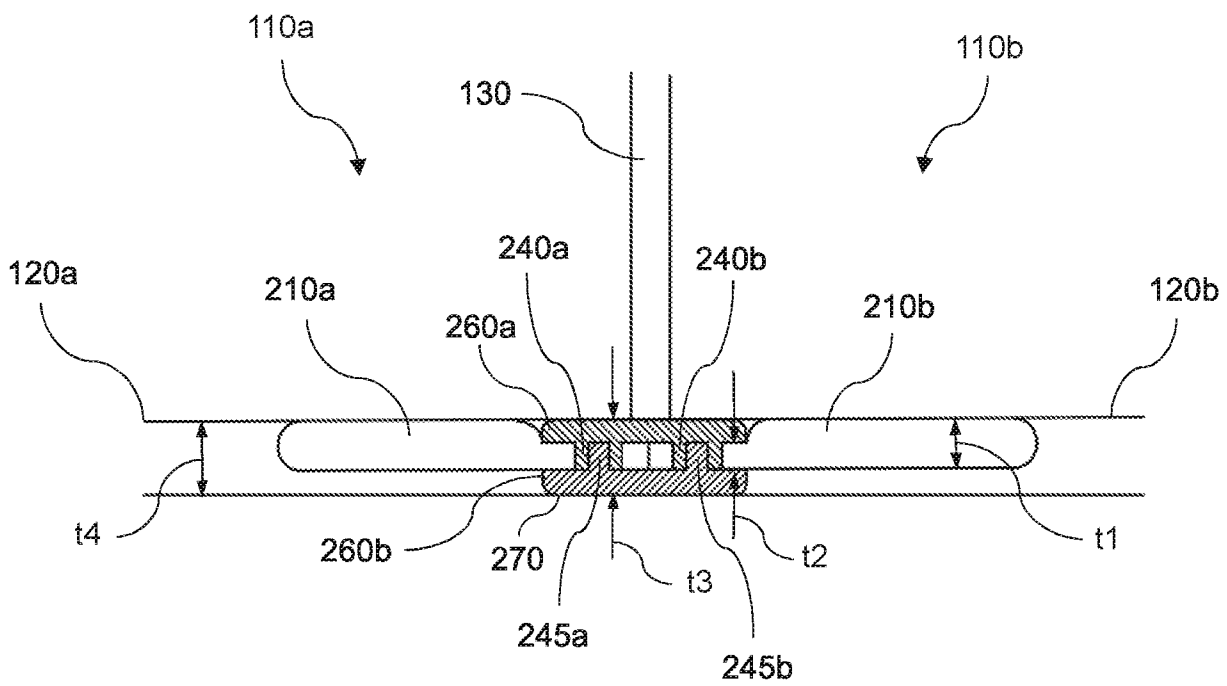


Fig. 2d

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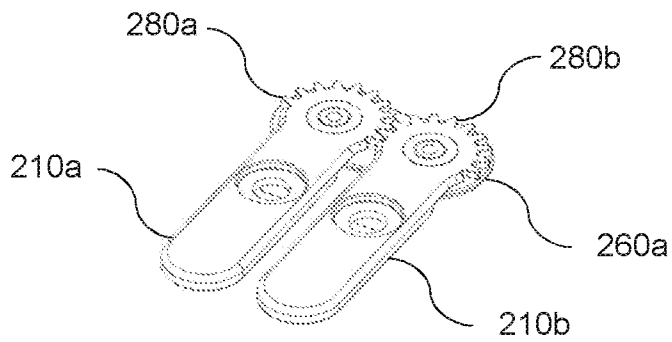


Fig. 3a

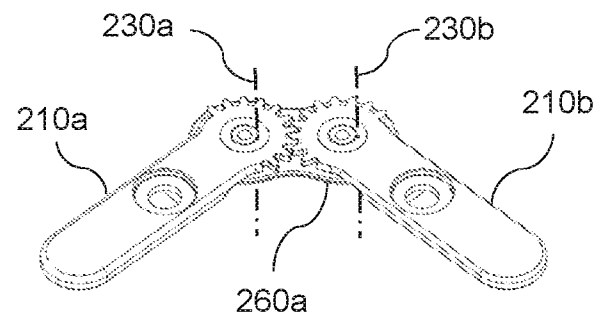


Fig. 3b

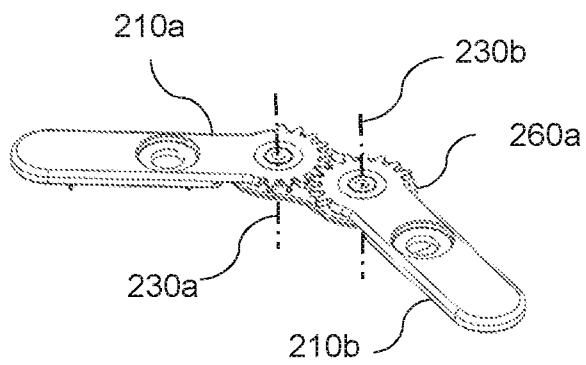


Fig. 3c

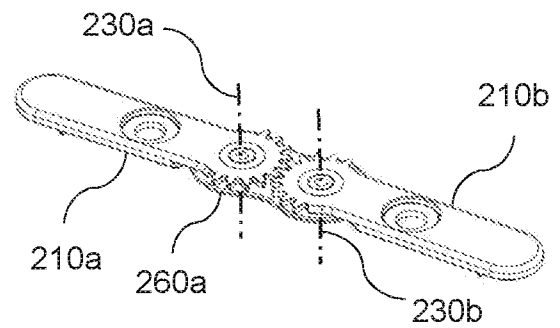


Fig. 3d

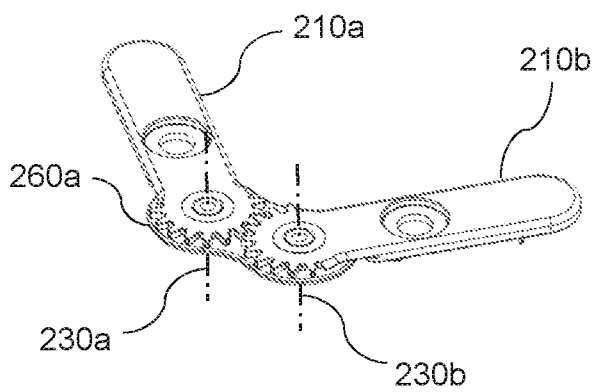


Fig. 3e

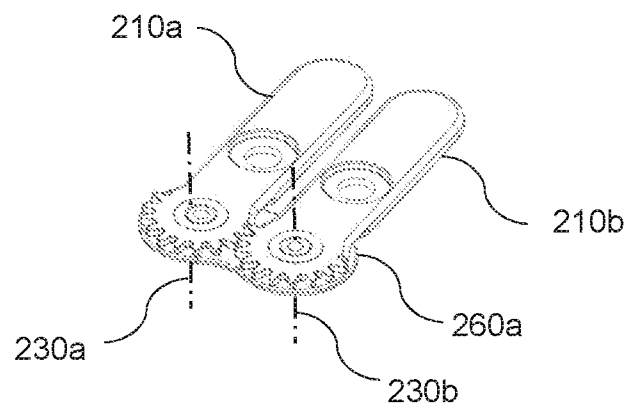


Fig. 3f

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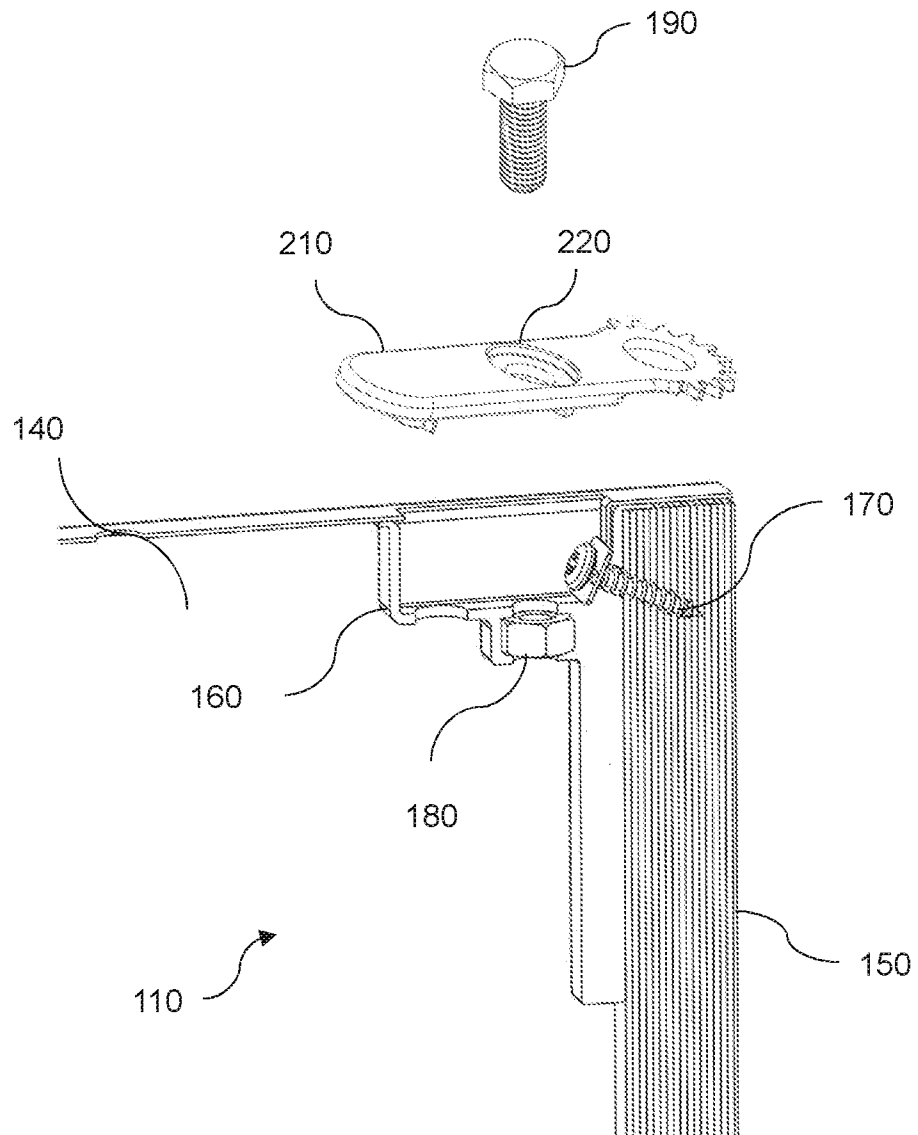


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2022/050609

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC: E04B

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

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, 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	US 20200347592 A1 (KUCHMAN CHRISTOPHER ET AL), 5 November 2020 (2020-11-05); abstract; paragraphs [0002], [0028], [0035]-[0037]; figures 1A,3B --	1-24
A	US 1661003 A (MILLER WALLACE W), 28 February 1928 (1928-02-28); abstract; page 2, line 6 - page 3, line 14; figures 1,2 --	1-24
A	US 20020138947 A1 (JANTSCHEK ROBERT J), 3 October 2002 (2002-10-03); whole document; all figures --	1-24

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"D" document cited by the applicant in the international application	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
19-07-2022

Date of mailing of the international search report
19-07-2022

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2022/050609

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5802778 A (THORP CLARKSON S ET AL), 8 September 1998 (1998-09-08); whole document; all figures --	1-24
A	US 20150374145 A1 (LINDBLOM THOMAS G), 31 December 2015 (2015-12-31); whole document; all figures --	1-24
A	FR 2605660 A1 (CLEN), 29 April 1988 (1988-04-29); whole document; all figures -- -----	1-24

Continuation of: second sheet
International Patent Classification (IPC)
E04B 2/74 (2006.01)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE2022/050609

US	20200347592 A1	05/11/2020	NONE		
US	1661003 A	28/02/1928	NONE		
US	20020138947 A1	03/10/2002	US	6574837 B2	10/06/2003
US	5802778 A	08/09/1998	NONE		
US	20150374145 A1	31/12/2015	US	9609961 B2	04/04/2017
FR	2605660 A1	29/04/1988	NONE		