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(54) **UNIT FOR ACCOMODATING PASSENGERS IN A VEHICLE AND VEHICLE EQUIPPED WITH SAID UNITS**

(57) A unit (1) for accommodating passengers in a vehicle, characterized in that it is divided into at least two portions (2,3) that are arranged adjacently and aligned in position of use, and in that it comprises a device (4) for reversing its own orientation, which mechanically links said portions (2,3) allowing them to move simultaneously, each one following a combined translation and turning movement on a horizontal plane, and according to
- a first path, in which both portions (2,3) complete a translation movement in a first same direction, separating from each other, while completing a rotating movement around corresponding vertical rotation shafts (21,31), and
- a second path, in which both portions (2,3) complete a translation movement in a second same direction, opposite the first one, moving towards each other until they are adjacent, while completing their rotating movement maintaining the direction of rotation until reaching a reversed position.

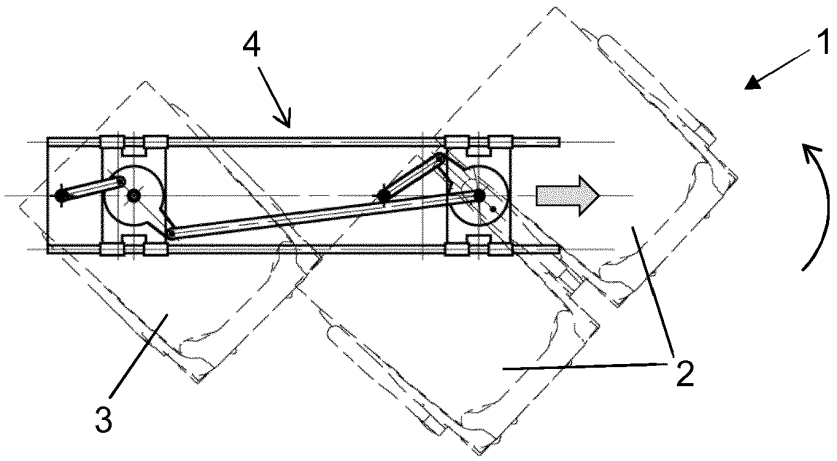

Fig. 7b

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Description

Technical field of the invention

[0001] The invention relates to a unit for accommodating passengers in a vehicle, which unit comprises a device for reversing its orientation. The invention also relates to a vehicle, especially for public transportation or similar uses, equipped with said units.

Background of the invention

[0002] Public transport vehicles, such as trains, are known that comprise a plurality of seats for accommodating passengers. Generally, the seats are arranged in transversal rows along the length of the train and are separated by a distributing aisle, such that each row of seats is arranged to be adjacent to said aisle on one side, and to a wall enclosing the vehicle on the opposite side, and separated from the respective rows in front and behind by a predetermined distance. Conventionally, each row comprises more than one seat, it being common to have one, two or three adjacent seats arranged on each side of the aisle, depending on the dimensions and the class of the vehicle.

[0003] Each seat, or chair if more comfort is desired, comprises a seat portion, a back and generally one or more armrests, up to a maximum of two armrests for each individual place to sit. Nevertheless, when using two or more attached seats, generally only one armrest is placed between each group of two seats with the goal of reducing the total width of the associated row.

[0004] As is known, the available space for placing rows of seats or chairs inside the vehicle is considerably limited. Furthermore, the distribution of the seats or chairs in the vehicle must comply with norms that establish or have as a consequence that a series of ergonomic requirements must be taken into account, such as the dimensions of the seats or chairs, the minimum distance between the rows, the minimum width of the aisle, etc. For vehicles with only one floor, it has been confirmed that, in Europe, the ideal distribution for optimizing the space inside a train is that which comprises two adjacent chairs on one side of the aisle and three adjacent chairs on the other side of the aisle (see figure 1).

[0005] Furthermore, in trains, reversible chairs are commonly used that can turn 180 degrees to reverse their orientation depending on the forward direction of the vehicle. Devices are known that allow for reversing the position of individual chairs or even of two attached chairs simultaneously around a vertical shaft.

[0006] If chairs with a device that allows for their position to be reversed are preferred, as is known, a common distribution is to arrange two rows of chairs that face each other, or grouped chairs, commonly arranged at one of the ends of the vehicle. In this case, the rows arranged at both ends of the vehicle are not reversible in order to optimize space. Furthermore, for ergonomic reasons, the necessary distance between grouped chairs is always greater than the distance established between rows facing the same direction.

[0007] The procedure for reversing the orientation of the rows of chairs is performed by first turning the row of grouped chairs, repeating this operation successively with each remaining row, such that the row of grouped chairs ends up arranged at the opposite end of the vehicle.

[0008] For certain types of chairs, the reversal in the orientation of the rows of chairs creates the need for the row of chairs to be moved back in order to comply with the pre-established distance between rows. This moving back procedure must be performed immediately after turning the row of chairs.

[0009] In order to simplify this process, an arrangement is known that makes it possible to eliminate said second procedure of moving the rows back, which consists of moving the rotation shaft of the assembly of attached chairs a predetermined distance towards the seat portion of the chair, in other words, away from the back portion, such that once the unit has turned halfway, it will automatically be situated in a farther back position, thereby complying with the required distance between rows.

[0010] Nevertheless, none of these known devices is suitable for reversing the orientation of rows of more than two chairs (when the arrangement of the rows has been defined in order to maximize the number of places to sit in the vehicle) due to the limited available space inside the vehicle.

[0011] Indeed, it has been found that if a row of three attached chairs is meant to be moved, one of the greater disadvantages is that said row needs a substantially large turn radius, whose turn path interferes with the rows of chairs directly in front and/or behind, preventing it from completing its half turn. This disadvantage occurs regardless of whether the rotation shaft is on a centered plane (see figure 2) or shifted towards the seat portion (see figure 3).

[0012] Furthermore, instead of turning the row of three attached chairs, turning each chair separately was considered. To do so, a mechanism can be used that allows for the three chairs to be turned simultaneously around separate rotation shafts while moving towards the aisle, separating themselves from the wall and from one another by the necessary distance to be able to turn. In this case, in order to avoid having two armrests attached in the reversed position in the unit, it is anticipated that the middle chair be devoid of armrests.

[0013] Nevertheless, it has been found that a disadvantage is that the necessary movement and turn of the chair adjacent to the aisle, which accumulates the movements of the other two chairs of the same row, is so great that it interferes with the row of two chairs arranged on the other side of the aisle, preventing the completion of its half turn (see figure 4), for which reason this mechanism is also not viable for reversing the orientation of a row of three chairs.

[0014] It would be desirable to have a suitable solution for reversing the orientation of one row of three seats or chairs that minimizes the free space needed in order to complete the procedure, for example, without producing interference with the rows of seats on the other side of the aisle or with the seats or chairs of the rows immediately in front and behind them inside a vehicle, such as a train, and that furthermore has a simple and compact structural configuration that allows for adequate integration in the cited vehicle. Likewise, it is of interest for said solution to allow for completing the reversing maneuver quickly, saving time required for this task and reducing operating costs. It is also of interest for the solution to be able to be mechanically implemented in a simple way, with few components in order to avoid an increase of manufacturing costs, and avoid high repair and maintenance costs.

Description of the invention

[0015] With the goal of providing a solution to the problems described above, a unit is presented for accommodating passengers in a vehicle, characterized in that the unit is divided into at least two portions that are arranged adjacently and aligned in position of use, at least one of these comprising a chair, and in that the unit comprises a device for reversing its own orientation, which mechanically links said first and second portions allowing them to move simultaneously, each one following a combined translation and turning movement on a horizontal plane, and according to

- a first path, started by pulling the first portion of the unit moving away from the second portion, in which a translation movement is produced in said first and second portions in a first same direction, but then separating from each other until a maximum separation position is reached, while completing a rotating movement around both integral vertical rotation shafts with said first and second portions, corresponding to approximately a quarter turn, and
- a second path, leaving from the maximum separation position, in which a translation movement of said first and second portions is produced in a same second direction, opposite from the first, moving towards each other until they are adjacent, while they continue their rotating movement, maintaining the direction of rotation until both first and second portions of the unit reach a final position of use in which they have completed a half turn, in this way reversing their orientation with respect to the initial position.

[0016] In this way, the orientation of the unit can be reversed quickly and efficiently in rooms where space is considerably limited, through the effects of the unit being divided into two differently sized portions, mechanically linked through a device such as the one claimed that is capable of moving both portions of the unit simultaneously using a combined translation and rotation movement.

[0017] Indeed, the path of said combined translation and rotation movement obtained in this way defines a lesser radius of rotation than that obtained through a unit with identical dimensions that turns as a single unit with respect to a central shaft.

[0018] Preferably, the unit is divided into at least two differently sized portions.

[0019] According to a preferred embodiment, the device for reversing the orientation of the unit comprises two rotating platforms that rotate around corresponding vertical rotation shafts, upon which said first and second portions of the unit rest, respectively, wherein both first and second platforms are movable and mounted along a respective guide or fixed track segment.

[0020] Advantageously, the guide or track segments, along which the first and second platforms move, form part of the same guide or track. Preferably, the guide or track sections are straight.

[0021] According to another characteristic of the invention, the rotating platforms are mounted on corresponding carriages coupled in a movable way along their respective guide or track segments.

[0022] Preferably, the first rotating platform is the crankshaft of a first crankshaft-rod mechanism, the connecting rod being articulately connected at one end to a fixed point; and the second rotating platform is the crankshaft of a second double crankshaft-rod mechanism, one of which is a transmitting connecting rod with one end articulately connected to the rotation shaft of the first rotating platform and the other is a short connecting rod articulately connected at one end to another fixed point.

[0023] This configuration of the mechanisms makes it possible to obtain a structurally simple and compact device, ensuring reduced production and maintenance costs, as well as the proper integration of the device in the unit.

[0024] According to another characteristic of the invention, the short and transmitting connecting rods of the second mechanism are articulately connected to the platform diametrically opposed with respect to the rotation shaft of the second rotating platform, i.e. with respect to the rotation shaft of the second portion of the unit.

[0025] Additionally, the fixed points to which the connecting rod and the short connecting rod are joined are aligned with the imaginary line that joins the rotation shafts of the first and second rotating platforms.

[0026] According to a variant, the device for reversing the orientation of the unit comprises manual activation means.

[0027] According to another variant, the device for reversing the orientation of the unit comprises actuation means in order to start the movement of the portions of the unit.

[0028] Advantageously, the device for reversing the orientation of the unit comprises locking means for fastening the unit in its position of use.

[0029] Preferably, the first portion of the unit is a double chair with two places to sit, and the second portion of the unit is an individual chair with one place to sit. Thus, the unit of the invention is apt for units of three adjacent chairs.

[0030] In accordance with another characteristic of the invention, each chair to sit on comprises a seat and a back, the double chair of the first portion being further provided with two or more armrests, two armrests being arranged on each side of the double chair, while the individual chair of the second portion is devoid of armrests, such that the arrangement of armrests is not affected by the reversal in the orientation of the respective chairs.

[0031] Optionally, the unit comprises a fixed armrest, always associated with the exterior of the individual chair independent of its orientation, that can adhere to the unit or to an adjacent portion of the vehicle.

[0032] Advantageously, the rotation shaft of the double chair is centered in between its respective places to sit.

[0033] Preferably, the rotation shafts of the respective double chairs and individual chair have been moved a predetermined distance towards the frontal portion of their seats, i.e. distanced from the back, in such a way that the chairs in their reversed position are automatically moved back said distance.

[0034] This arrangement with the moved rotation shaft is suitable when the chair units are arranged in rows separated by a predetermined distance between them, with at least two rows of chairs facing each other in a group that have more distance between them. Through the effects of the moved rotation shaft, once the rows of chairs are turned they are automatically moved backwards towards the contiguous row behind them, maintaining the required distance between rows, avoiding the need to move each row back after it is turned.

[0035] In accordance with another aspect, the invention also relates to a vehicle, especially for public transportation or similar uses, that comprises a room provided with a plurality of rows of units like the ones described above, arranged on one side of a distributing aisle and adjacent to an enclosing wall of said room.

[0036] Preferably, the first portion of the unit is a double chair with two places to sit, and the second portion of the unit is an individual chair with one place to sit, the double chair arranged contiguous to the aisle, while the individual chair is placed next to said enclosing wall, such that the double chair occupies a portion of the aisle during the translation and rotation movement of the unit.

[0037] Additionally, the arrangement of a fixed armrest is anticipated, or endowing the wall of the vehicle with a shape that can carry out the same function, adjacent to the individual chair of the second portion.

Brief description of the drawings

[0038] The accompanying drawings illustrate, by way of a non-limiting example, a preferred embodiment of the unit for accommodating passengers in a vehicle object of the invention, and of a vehicle that comprises said units. In said drawings:

Fig. 1 is a schematic plan view of a vehicle provided with a plurality of rows of units of three attached chairs on one side of the aisle and two attached chairs on the other side of the aisle, known in the state of the art;

Figs. 2 and 4 are schematic views of the vehicle according to Fig. 1, respectively showing the rotating movement of a three-chair unit according to various proposals that are not viable since their movement produces interference with the rows of adjacent units;

Fig. 5 is a schematic layout of a vehicle provided with a plurality of rows of units, object of the present invention, showing the combined translation and rotation movement of a unit divided into two portions, where the first portion is a double chair with two places to sit, and the second portion is an individual chair with one place to sit;

Fig. 6 is a plan view of the device for reversing the orientation of a unit object of the invention, according to an embodiment of the invention; and

Figs. 7a to 7e schematically show the sequence of the combined translation and rotation movement of a unit object of the invention, from its initial position until reaching the final reversed position.

Detailed description of an embodiment

[0039] Figure 1 shows a public transportation vehicle 100, such as a train car, according to the state of the art, that comprises a plurality of seats F1, F2, F3, F4 of units 1' for accommodating passengers, separated by a distributing aisle 101, such that each row of units 1' is arranged adjacent on one side of said aisle 101 and on its other side with an enclosing wall 102 of the vehicle 100, and separated from the respective rows in front and behind by a predetermined distance.

[0040] In this case, rows of units 1' with three attached chairs on one side of the aisle 101 and two attached chairs on the other side of the aisle 101 have been represented. It has been confirmed that this arrangement of units 1' is ideal for optimizing the limited space inside the vehicle 100.

[0041] Each chair comprises a seat portion 15 and a back portion 16 and two armrests 17. In the case of using units with two or more adjacent chairs, only one armrest is placed between each two chairs with the goal of reducing the total width of the unit; for example, if it is a unit with two chairs, i.e. with two places to sit, three armrests 17 are placed, one arranged in the middle and one on each side of the unit. Nevertheless, it is worth noting that it is possible to use an arrangement without armrests between each two chairs, for which reason only two armrests would be placed, one on each side of the unit of chairs.

[0042] As mentioned previously, it has been found that it is not easy to turn a unit 1' of three attached chairs simultaneously around one centered rotation shaft A, since its turn path interferes with the rows of chairs directly in front and behind, as seen in figure 2, preventing it from completing its half turn.

[0043] As seen in figure 3, this disadvantage also occurs if a rotation shaft B moved towards the frontal portion of the seat is used, for which reason it is not a viable solution either. This arrangement with the moved rotation shaft is suitable when the chair units are arranged in rows separated by a predetermined distance between them, with at least two rows of chairs that have more distance between them facing each other in a group, as seen in figures 1 to 4. Through the effects of the moved rotation shaft, once the rows of chairs are turned they are automatically moved backwards towards the contiguous row behind them, maintaining the required distance between rows and avoiding the need to move each row back after it is turned.

[0044] On the other hand, as seen in figure 4, if a mechanism is to be used that allows for the three chairs to be turned simultaneously around separate rotation shafts A1, A2, A3, while moving towards the aisle 101, separating themselves from the wall 102 and from one another by the necessary distance to be able to turn, it has been found that the movement and turn of the chair adjacent to the aisle 101 is so great that it interferes with the row of the unit of two chairs arranged on the other side of the aisle 101, preventing the completion of its half turn, for which reason it is not viable.

[0045] In figure 5 a vehicle 100 is shown that comprises a plurality of rows F1, F2, F3 of units 1 with three chairs according to the present invention, arranged on one side of the aisle 101, and conventional units with two chairs on the other side of the aisle.

[0046] Each unit 1 according to the invention is divided into two differently sized portions 2,3 that are arranged adjacently and aligned in position of use. In this embodiment, the first portion 2 of the unit 1 is a double chair 2a,2b with two places to sit, and the second portion 3 of the unit 1 is an individual chair 3a with one place to sit, the double chair 2a,2b being arranged contiguous to the aisle 101, while the individual chair 3a is placed adjacent to said enclosing wall 102. Nevertheless, according to another embodiment, the double chair 2a,2b could be placed adjacent to the wall 102 and the individual chair 3a adjacent to the aisle 101.

[0047] Furthermore, the double chair 2a,2b of the first portion 2 is provided with three armrests 17, one arranged in the middle and two on each side, while the individual chair 3a of the second portion 3 is devoid of armrests. In this way, the three chairs 2a,2b,3a will have the same armrests in their reversed position, except for the individual chair 3a that will never have armrests on the side contiguous to the enclosing wall 102. For this reason, the arrangement of a fixed armrest 18 on the enclosing wall 102 is anticipated, as seen in figure 5, or the wall 102 could be given that can carry out the same function, adjacent to the individual chair 3a of the second portion 3.

[0048] As seen in figure 5, the rotation shaft 21 of the double chair 2a,2b is centered in between its respective places to sit. Likewise, due to the fact that it has two rows facing each other in a group with more separation than the pre-established distance between rows, it is anticipated that the rotation shafts 21, 31 of the respective double chairs 2a,2b and individual chair 3a are moved a predetermined distance towards the front part of their seats 15, i.e. distanced from the back 16, such that the chairs 2a,2b,3a in their reversed position will be placed automatically complying with the pre-established distance between rows. Thus, the correct distance between the rows is guaranteed both for the original position and for the reversed position.

[0049] Even though an exemplary embodiment has been described wherein three chairs are arranged on one side of the aisle and two chairs on the other side of the aisle, other arrangements of the rows may be anticipated as well, for example three or more chairs could be placed on one side of the aisle and no chairs on the other side of the aisle.

[0050] Likewise, it could also be anticipated that the chair or chairs of the first portion 2 of the unit 1 are oriented in one direction and that the chair or chairs of the second portion 3 are oriented in the opposite direction.

[0051] On the other hand, each unit 1 comprises a device 4 for reversing its own orientation, which mechanically links said first 2 and second 3 portions, allowing them to move simultaneously, each one following a combined translation and turning movement on a horizontal plane, such that the double chair 2a,2b occupies a part of the aisle 101 during said translation and rotation movement, as will be explained later on.

[0052] In figure 6 a preferred embodiment is shown of said device 4 for reversing the orientation of unit 1, which comprises two rotating platforms 5,6 that rotate around corresponding vertical rotation shafts 21,31, upon which said first 2 and second 3 portions of the unit 1 rest, respectively.

[0053] Likewise, both first 5 and second 6 platforms are movable and mounted along a respective guide or fixed track segment 72,73. Furthermore, the rotating platforms 5,6 are mounted on corresponding carriages 8,9 coupled in a movable way along their respective guide or track segments 72,73. In this example, said segments 72,73 are straight and form part of the same guide or track 7.

[0054] In this preferred embodiment, the first rotating platform 5 is the crankshaft of a first crankshaft-rod mechanism 10, the connecting rod 11 being articulately connected at one end to a fixed point 11 a; and the second rotating platform 6 is the crankshaft of a second double crankshaft-rod mechanism 12, one of which is a transmitting connecting rod 13 with one end articulately connected to the rotation shaft 21 of the first rotating platform 5 and the other is a short connecting rod 14 articulately

connected at one end to another fixed point 14a.

[0055] Furthermore, the transmitting 13 and short 14 connecting rods of the second mechanism 12 are articulately connected to the platform 6 diametrically opposed with respect to the rotation shaft 31 of the second rotating platform 6, i.e. with respect to the rotation shaft of the second portion 3 of the unit 1. Furthermore, the fixed points 11 a, 14a to which the connecting rod 11 and the short connecting rod 14 are joined are aligned with the imaginary line L that joins the rotation shafts 21,31 of the first and second rotating platforms 5,6.

[0056] It is worth noting that instead of using a transmitting connecting rod 13 between both crankshaft-rod mechanisms 10 and 12, any other equivalent system could be used that allows for synchronizing the movements between said mechanisms 10 and 12.

[0057] The device 4 for reversing the orientation of the unit 1 can comprise manual activation means or actuation means in order to start the movement of the portions 2,3 of the unit 1. The actuation means can be motorized or be energy accumulators, for example via elastic, pneumatic or hydraulic means, among other possibilities.

[0058] Furthermore, the device 4 comprises locking means for fastening the unit 1 in its position of use.

[0059] Figures 7a and 7e show the sequence of the combined translation and rotation movement of the unit 1, which is described below:

> From the initial position (see figure 7a) the unit 1 moves along a first path, started by pulling the first portion 2 of the unit 1 moving away from the second portion 3, in this case towards the aisle 101, in which a translation movement is produced in said first 2 and second 3 portions in a first same direction, separating from each other, while completing a rotating movement around corresponding vertical rotation shafts 21,31 that move together with said first 2 and second 3 portions (see figure 7b), until a maximum separation position is reached, corresponding to approximately a quarter turn (see figure 7c).

[0060] Therefore, by moving the first portion 2 towards the aisle 101, the device 4 will start to turn said first portion 2, and at the same time will pull the second portion 3 and cause it to rotate.

[0061] From said maximum separation position, the unit 1 completes a second path, in which a translation movement of said first 2 and second 3 portions is produced in a same second direction, opposite from the first, in this case away from the aisle 101, moving towards each other while they continue their rotating movement, maintaining the direction of rotation (see figure 7d) until both first 2 and second 3 portions of the unit 1 are adjacent, reaching a final position of use in which they have completed a half turn (see figure 7e), in this way reversing their orientation with respect to the initial position.

[0062] It is worth noting that in the intermediary position shown in figure 7c, there is a moment in which all the connecting rods 11, 13 and 14 are aligned with the rotation shafts 21,31, where both portions 2,3 have enough inertia to continue the movement of the second path, for which reason the risk of reversing the mechanisms 10,12 in this position can be dismissed. Nevertheless, the unit 1 may comprise a mechanism that prevents the reversal of the movement of the device 4 in this intermediary position.

[0063] Therefore, once the intermediary position is surpassed, pushing the portion 2 towards the wall 102 is enough to make both portions 2,3 rotate until they reach the final reversed position where they will need to be locked into place.

[0064] The direction of the translation movement of the unit 1 during the first and second paths has been represented with the straight arrow that illustrates the pushing and pulling forces, respectively, that act on the first portion 2 of the unit 1. Likewise, the rotation direction of both portions 2,3 is also illustrated with a curved arrow.

Claims

1. A unit (1) for accommodating passengers in a vehicle, **characterized in that** the unit (1) is divided into at least two portions (2,3) that are arranged adjacently and aligned in position of use, at least one of these comprising a chair (2a,2b,3a), and **in that** the unit (1) comprises a device (4) for reversing its own orientation, which mechanically links said first (2) and second (3) portions allowing them to move simultaneously, each one following a combined translation and turning movement on a horizontal plane, and according to

   - a first path, caused by pulling the first portion (2) of the unit (1) moving away from the second portion (3), in which a translation movement is produced in said first (2) and second (3) portions in a first same direction, but then separating from each other until a maximum separation position is reached, while completing a rotating movement around corresponding vertical rotation shafts (21,31) that move together with said first (2) and second (3) portions, corresponding to approximately a quarter turn, and
   - a second path, leaving from the maximum separation position, in which a translation movement of said first (2) and second (3) portions is produced in a same second direction, opposite from the first, moving towards each other until they are adjacent, while they continue their rotating movement, maintaining the direction of rotation until both first (2) and second (3) portions of the unit (1) reach a final position of use in which they have completed a half turn, in this way reversing their orientation with respect to the initial position.

2. The unit (1) for accommodating passengers in a vehicle, according to claim 1, **characterized in that** it is divided into two differently sized portions (2,3).

3. The unit (1) for accommodating passengers in a vehicle, according to claim 1 or 2, **characterized in that** the device (4) for reversing the orientation of the unit (1) comprises two rotating platforms (5,6) rotable around corresponding vertical rotation shafts (21,31), upon which said first (2) and second (3) portions of the unit (1) rest, respectively, and **in that** both first (5) and second (6) platforms are mounted movable along a respective guide or fixed track segment (72,73).

4. The unit (1) for accommodating passengers in a vehicle, according to claim 3, **characterized in that** the guide or track segments (72,73), along which the first (5) and second (6) platforms move, form part of the same guide or track (7).

5. The unit (1) for accommodating passengers in a vehicle, according to claim 3 or 4, **characterized in that** the guide or track segments (72,73) are straight.

6. The unit (1) for accommodating passengers in a vehicle, according to any of claims 3 to 5, **characterized in that** the rotating platforms (5,6) are mounted on corresponding carriages (8,9) coupled in a movable way along their respective guide or track segments (72,73).

7. The unit (1) for accommodating passengers in a vehicle, according to any of claims 3 to 6, **characterized in that** the first rotating platform (5) is the crankshaft of a first crankshaft-rod mechanism (10), the connecting rod (11) being articulately connected at one end to a fixed point (11 a); and the second rotating platform (6) is the crankshaft of a second double crankshaft-rod mechanism (12), one of which is a transmitting connecting rod (13) with one end articulately connected to the rotation shaft (21) of the first rotating platform (5) and the other is a short connecting rod (14) articulately connected at one end to another fixed point (14a).

8. The unit (1) for accommodating passengers in a vehicle, according to claim 7, **characterized in that** the transmitting (13) and short (14) connecting rods of the second mechanism (12) are articulately connected to the platform (6) diametrically opposed with respect to the rotation shaft (31) of said second rotating platform (6), i.e. with respect to the rotation shaft of the second portion (3) of the unit (1).

9. The unit (1) for accommodating passengers in a vehicle, according to claim 7 or 8, **characterized in that** the fixed points (11a, 14a) to which the connecting rod (11) and the short connecting rod (14) are joined are aligned with an imaginary line (L) that joins the rotation shafts (21,31) of the first and second rotating platforms (5,6).

10. The unit (1) for accommodating passengers in a vehicle, according to any of claims 1 to 9, **characterized in that** the device (4) for reversing the orientation of the unit (1) comprises manual activation means.

11. The unit (1) for accommodating passengers in a vehicle, according to any of claims 1 to 9, **characterized in that** the device (4) for reversing the orientation of the unit (1) comprises actuation means in order to cause the movement of the portions (2,3) of the unit (1).

12. The unit (1) for accommodating passengers in a vehicle, according to any of the previous claims, **characterized in that** the device (4) for reversing the orientation of the unit (1) comprises locking means for fastening the unit (1) in its position of use.

13. The unit (1) for accommodating passengers in a vehicle, according to any of the previous claims, **characterized in that** the first portion (2) of the unit (1) is a double chair (2a,2b) with two places to sit, and the second portion (3) of the unit (1) is an individual chair (3a) with one place to sit.

14. The unit (1) for accommodating passengers in a vehicle, according to claim 13, **characterized in that** each chair to sit on comprises a seat (15) and a back (16), the double chair (2a,2b) of the first portion (2) being further provided with two or more armrests (17), two armrests (17) being arranged on each side of the double chair (2a,2b), while the individual chair (3a) of the second portion (3) is devoid of armrests, such that the arrangement of the three armrests (17) is not affected by the reversal in the orientation of the respective chairs (2a,2b,3a).

15. The unit (1) for accommodating passengers in a vehicle, according to claim 13 or 14, **characterized in that** it comprises a fixed armrest (18), always associated with the exterior of the individual chair (3a) regardless of its orientation, that can adhere to the unit (1) or to an adjacent portion of the vehicle.

16. The unit (1) for accommodating passengers in a vehicle, according to any of claims 13 to 15, **characterized in that** the rotation shaft (21) of the double chair (2a,2b) is centered in between its respective places to sit.

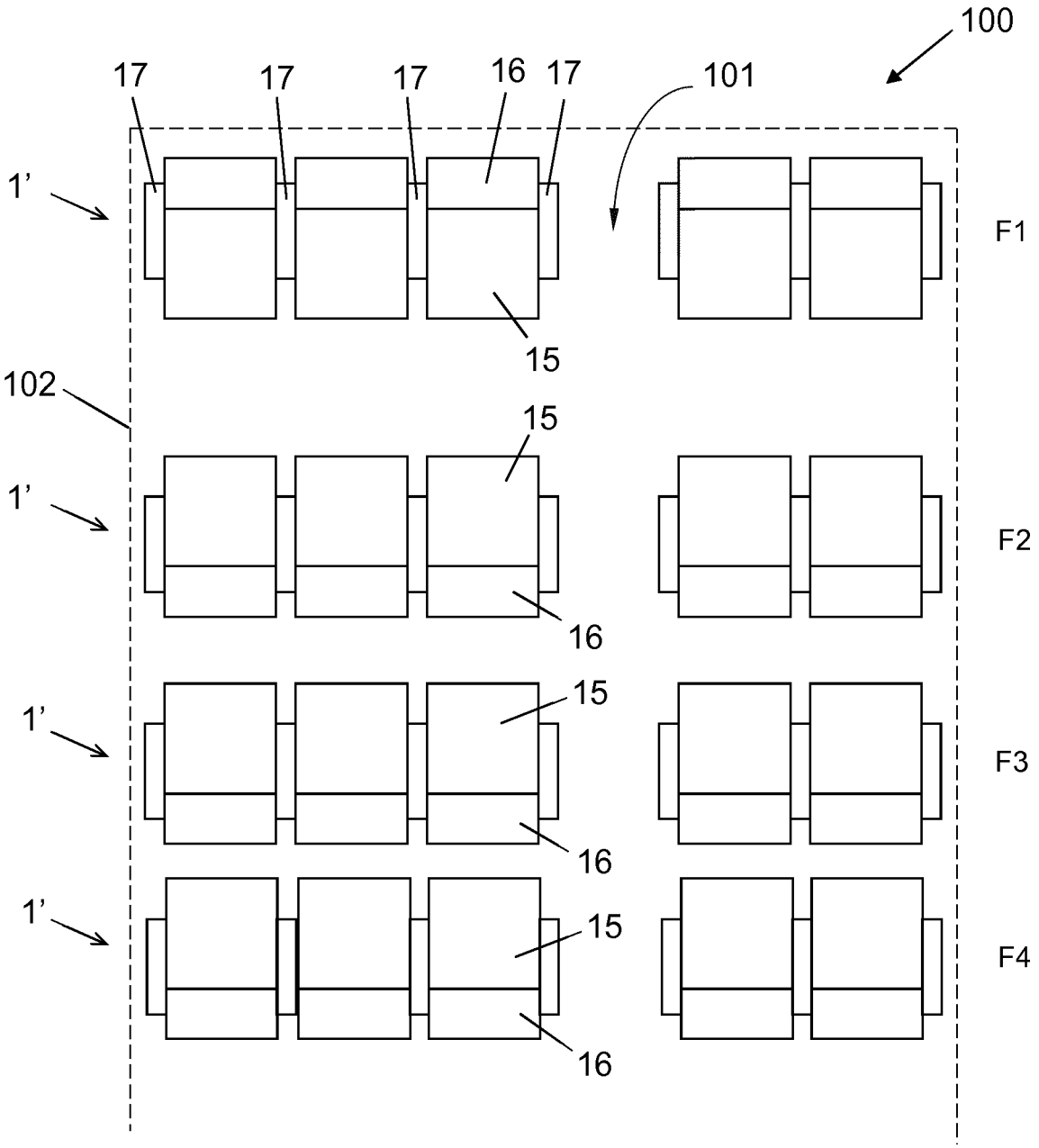
17. The unit (1) for accommodating passengers in a vehicle, according to any of claims 13 to 16, **charac-**

terized in that the rotation shafts (21, 31) of the respective double chairs (2a,2b) and individual chair (3a) are placed at a predetermined distance towards the front part of their seats (15), i.e. distanced from the back (16), in such a way that the chairs (2a,2b,3a) in their reversed position are automatically moved back said distance.

18. A vehicle (100), especially for public transportation or similar uses, that comprises a room provided with a plurality of rows of units (1), according to any of claims 1 to 17, arranged on one side of a distributing aisle (101) and adjacent to an enclosing wall (102) of said room.

19. The vehicle (100) according to claim 18, **characterized in that** the first portion (2) of the unit (1) is a double chair (2a,2b) with two places to sit, and the second portion (3) of the unit (1) is an individual chair (3a) with one place to sit, the double chair (2a,2b) being arranged contiguous to the aisle (101), while the individual chair (3a) is placed next to said enclosing wall (102), such that the double chair (2a,2b) occupies a portion of the aisle (101) during the translation and rotation movement of the unit (1).

20. The vehicle (100) according to any of claims 18 or 19, **characterized in that** the arrangement of a fixed armrest (18) is anticipated, or endowing the wall (102) of the vehicle with a shape that can carry out the same function, adjacent to the individual chair (3a) of the second portion (3).



State of the art

Fig. 1

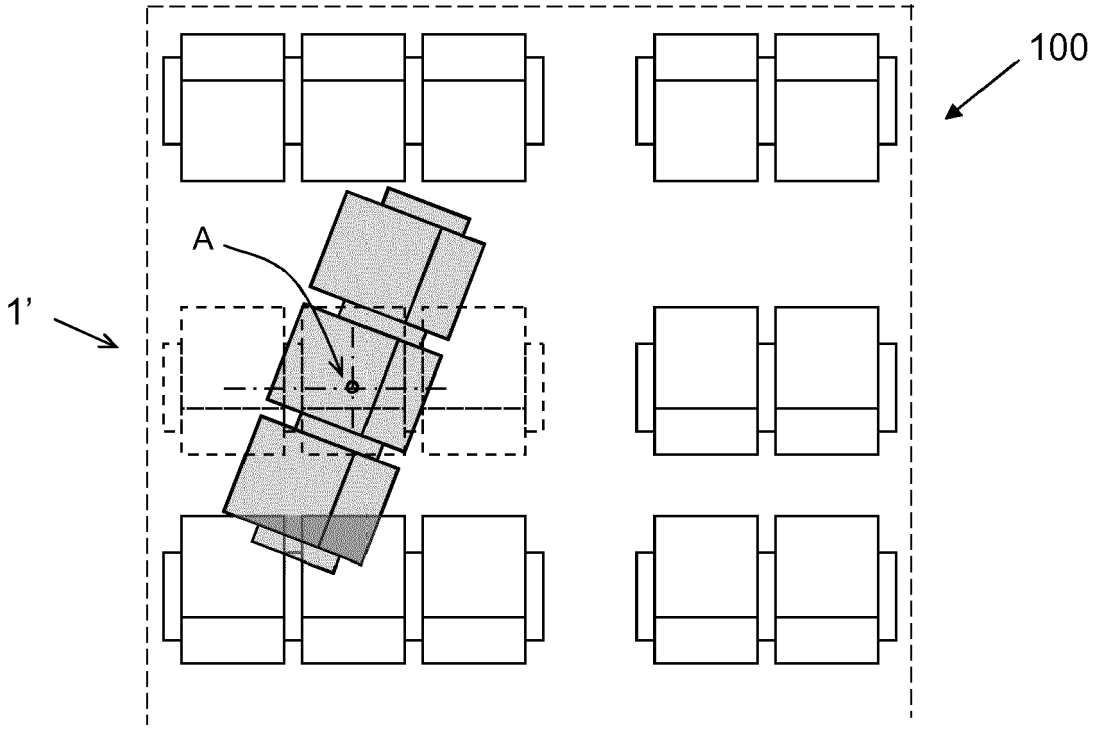


Fig. 2

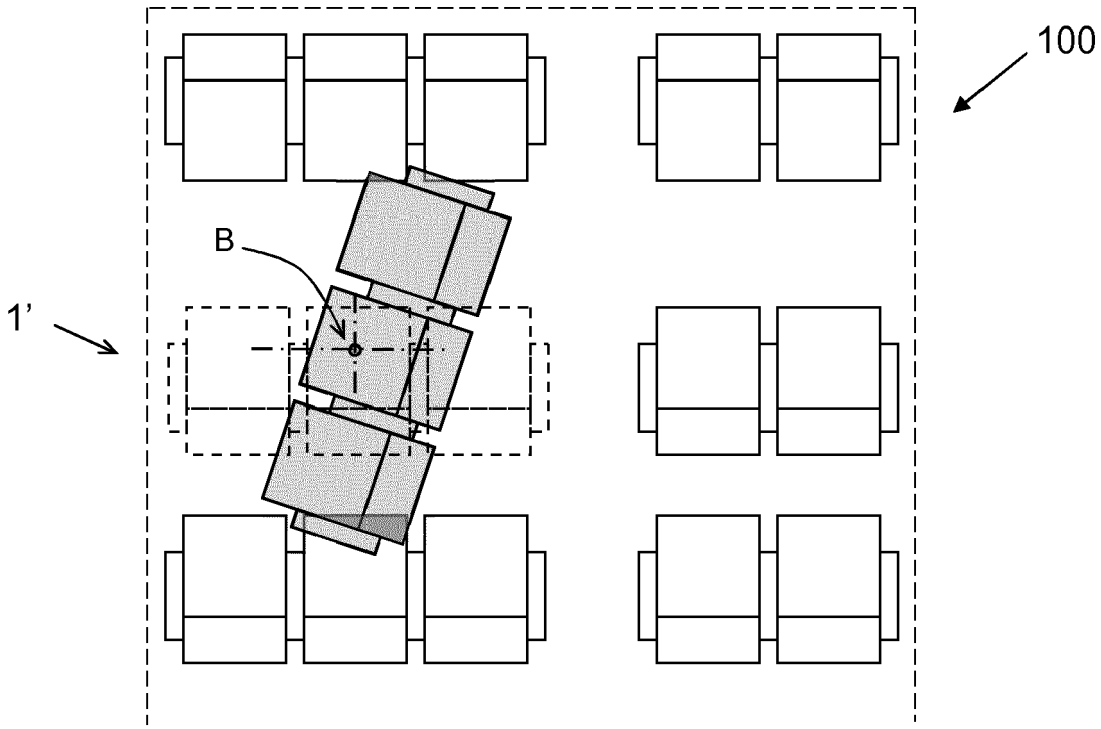


Fig. 3

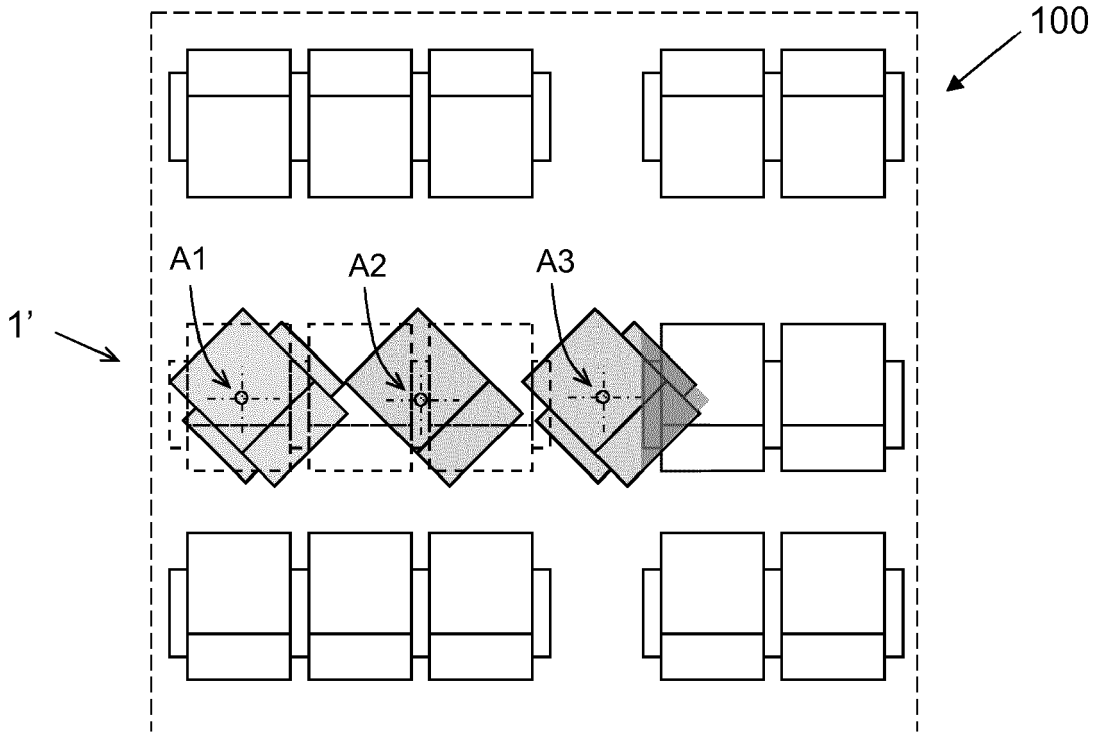


Fig. 4

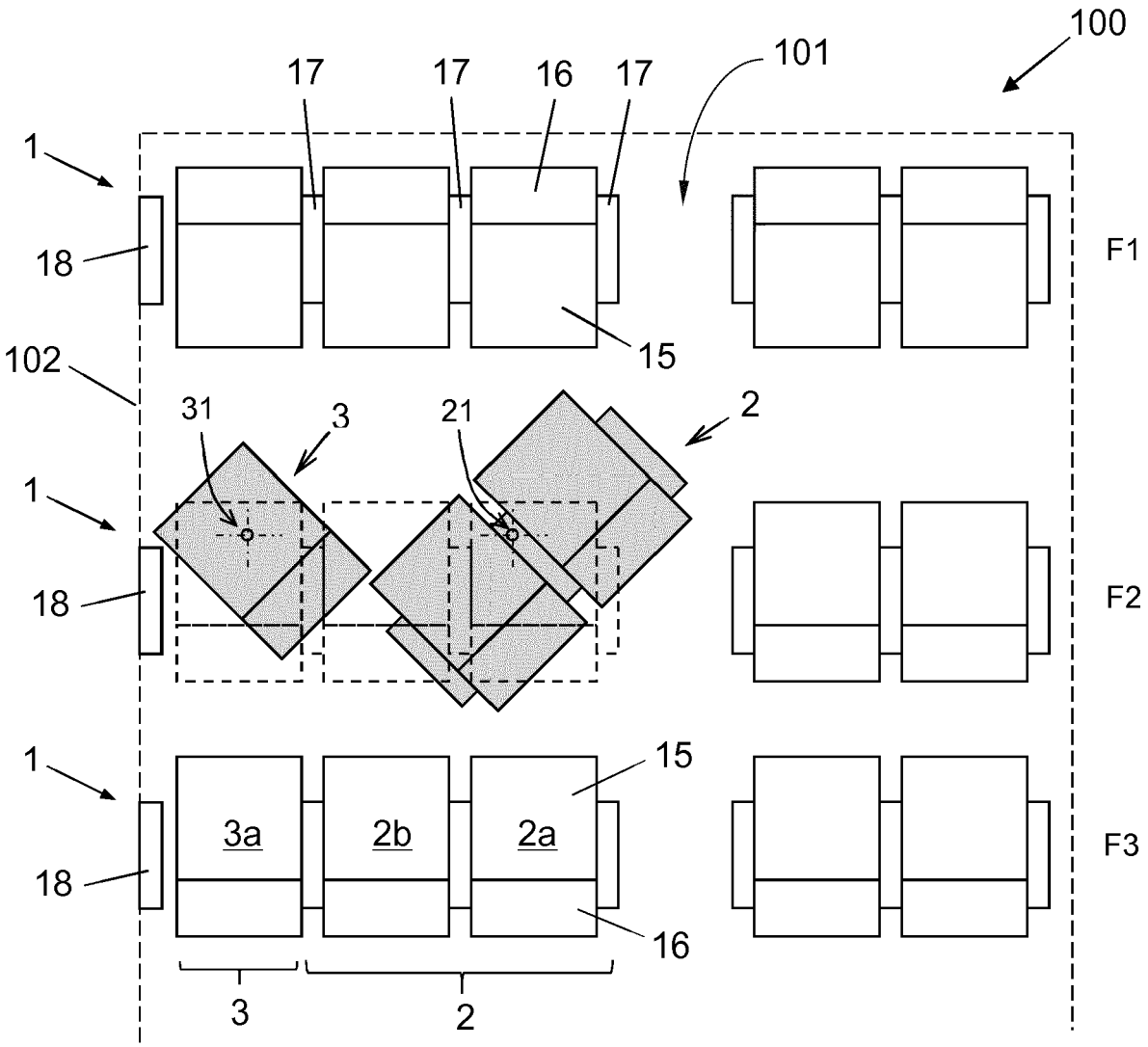

100
101
17
17
16
17
1
18
F1
15
102
31
3
21
2
1
18
F2
1
15
3a
2b
2a
18
F3
16
3
2

Fig. 5

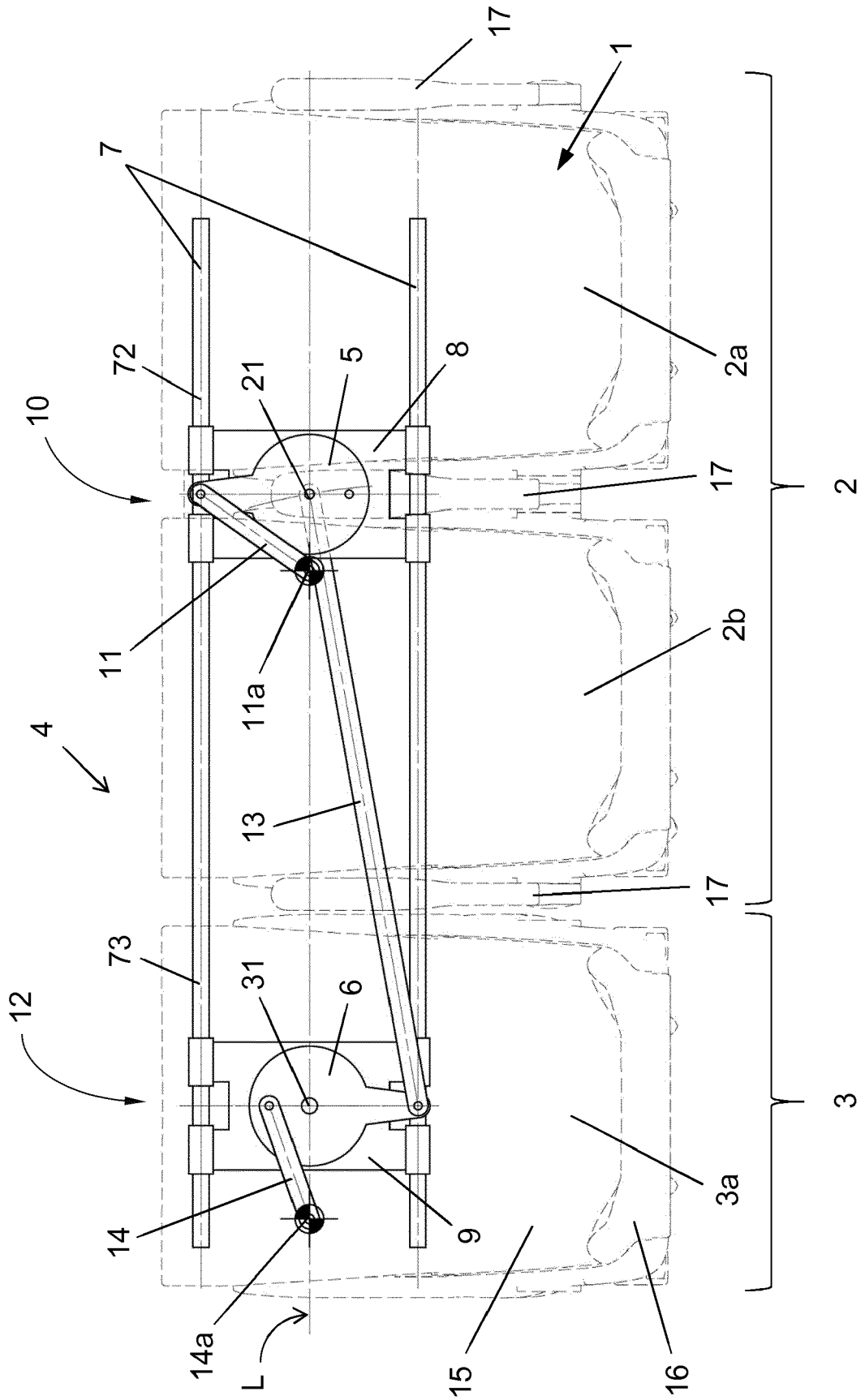

17
1
7
72
21
5
8
2a
10
17
2
11
11a
2b
4
13
17
73
31
6
12
3
3a
14
9
14a
L
15
16

Fig. 6

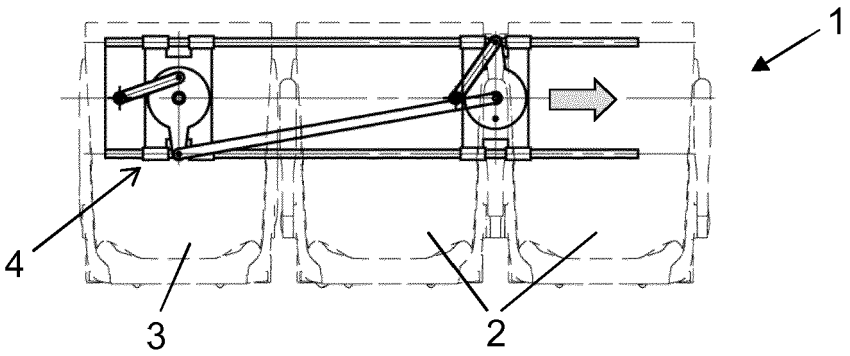


Fig. 7a

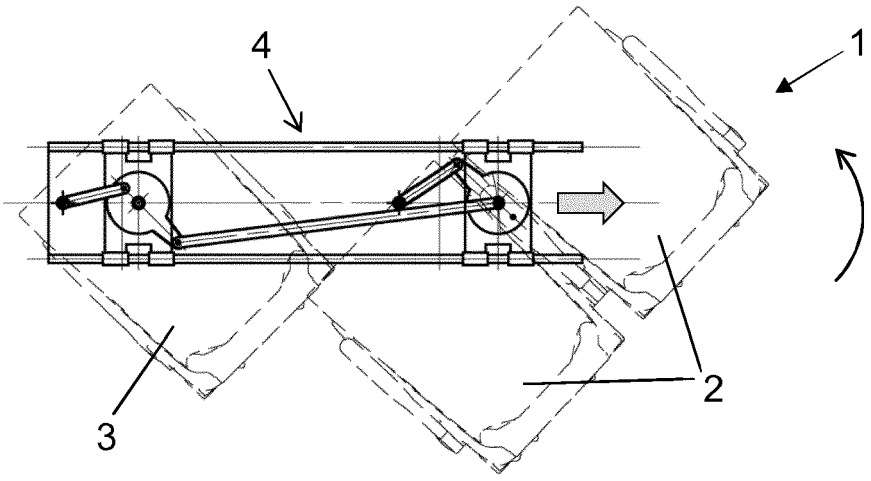


Fig. 7b

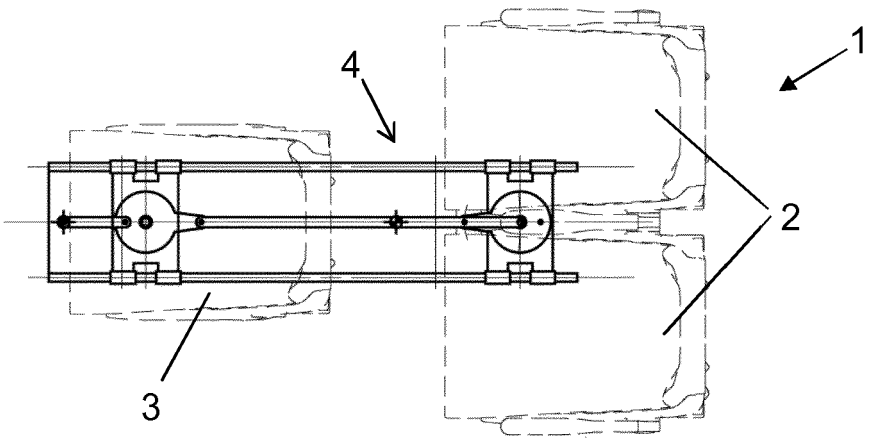


Fig. 7c

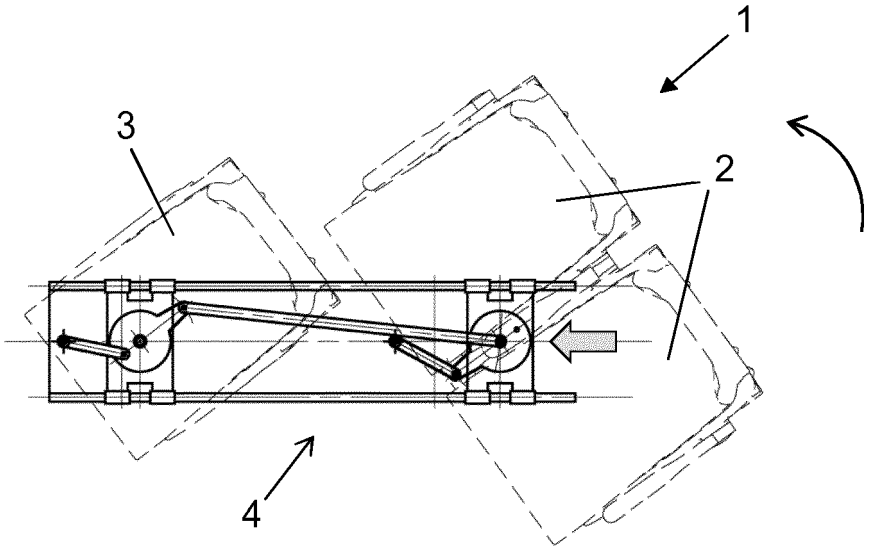


Fig. 7d

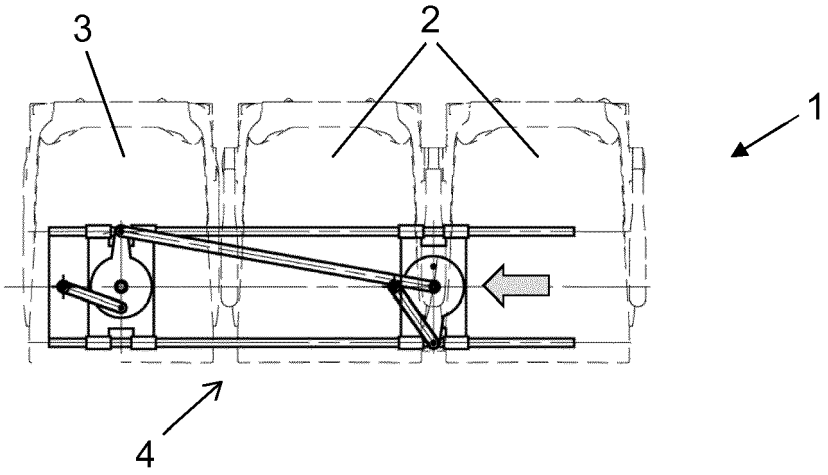


Fig. 7e

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 17 38 2073

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 1 209 760 A (PAUL&VICTOR MORITZ) 3 March 1960 (1960-03-03) * the whole document * -----	1-20	INV. B61D33/00

TECHNICAL FIELDS SEARCHED (IPC)

B61D
B64D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 August 2017	Lorandi, Lorenzo

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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08-08-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 1209760 A	03-03-1960	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82