



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
12.01.2022 Bulletin 2022/02

(51) Int Cl.:
A47C 1/124 (2006.01)

(21) Application number: **21184884.1**

(22) Date of filing: **09.07.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Berbers, Lambertus Jacobus**
5831 CL Boxmeer (NL)

(72) Inventor: **Berbers, Lambertus Jacobus**
5831 CL Boxmeer (NL)

(74) Representative: **Verhees, Godefridus Josephus Maria**
Brabants Octrooibureau
De Pinckart 54
5674 CC Nuenen (NL)

(30) Priority: **09.07.2020 NL 2026041**
21.09.2020 NL 2026509

(54) **METHOD FOR CONNECTING TWO CHAIRS, AS WELL AS COMBINATION OF TWO LINKED CHAIRS**

(57) In a method of coupling two chairs (109), each of which has a leg (111, 113) on either side, one of which is provided with a projection (127) and the other is provided with a recess (125) into which the projection (127) can hook, the two chairs (109) are placed next to and against each other with the one seat protrudes forward relative to the other seat, and then the two seats are

shifted relative to each other so that they are aligned. When sliding, the projection (127) on the leg of one chair hooks into the recess (125) present in the leg of the further chair. Thereafter, frame parts present on either side of the chairs, which are present at a distance above the leg, are fixed relative to each other by a coupling piece (101).

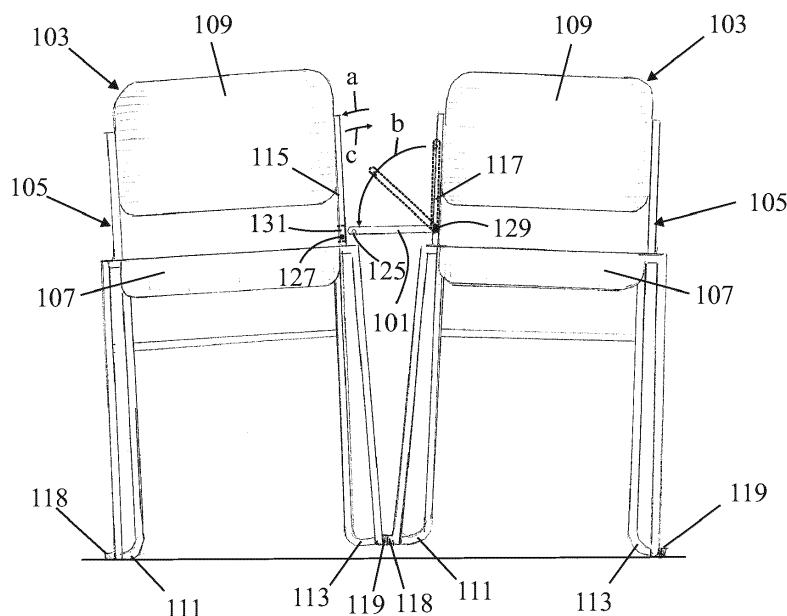


FIG. 1

Description

Technical field of the invention

[0001] The invention relates to a method for laterally coupling two chairs to each other, as well as to an assembly of at least two adjacent and coupled chairs.

Background of the invention

[0002] A method for coupling two chairs according to the preamble of claim 1 and an assembly of two adjacent and coupled chairs according to the preamble of claim 4 are known from US 3 614 157 A. they are placed in rows in front of a podium. It is desirable and often also required to couple the chairs present in a row to each other laterally. These couplings must be firm to prevent the chairs from becoming detached from each other and/or twisting relative to each other at undesired moments, so that they are no longer present in a row next to each other.

Summary of the invention

[0003] An object of the invention is to provide a method for coupling two chairs and to provide an assembly of at least two chairs, wherein the chairs can be coupled to each other quickly and easily. When linking two chairs, each comprising a frame, which:

- comprises a foot or leg on either side of the chair, one of which is provided with a pin and the other is provided with a recess into which a pin on a further foot or leg of a further chair can slide, thereby hooking behind a boundary wall of the recess, and
- on either side of the chair a frame part is provided that is present at a distance above the foot or leg,

wherein:

- the pin on the foot or leg of one of the chairs is slid into the recess of the other seat, and
- one of the frame parts of one of the seats is coupled to one of the frame parts of the other seat,

the method according to the invention is characterized in that:

- the two seats are placed next to and against each other with one seat protruding forward relative to the other seat, and then the two seats are shifted relative to each other such that the pin on one foot or leg of the chairs is slid into the recess present in the further foot or leg of the further chair and thereby hooks behind the wall of the recess, and
- the frame parts of the chairs present near each other and which are present at a distance above the feet

or legs are coupled to each other via a coupling piece, wherein the coupling piece fixes the frame parts immovably with respect to each other.

[0004] Without physical strength or discomfort, chairs, including chairs that have four legs or have a foot on each side, can be quickly, easily and securely connected to each other.

[0005] An embodiment of the method according to the invention is characterized in that the coupling piece is rotatably connected with one end to one of the frame parts and near the other end is provided with a slot which, in the coupled condition, with a first end extends from a lower edge of the coupling piece, and the other frame part is provided with a protrusion which is in the slot in the coupled condition, wherein in the method the frame parts are first moved slightly apart and then towards each other again or vice versa to get the protrusion on the frame part into the slot in the coupling piece. As a result, the chairs are secured relative to each other during use. In particular if a person is sitting on the seat, it is impossible to disconnect the seats because in order to move the frame parts towards or away from each other, the seats have to be turned around the coupling at the bottom (at the feet or legs) requiring at least one of the chairs to be lifted slightly.

[0006] In a further embodiment of the method wherein the slot in the coupling piece extends obliquely to the lower edge or has a stepped shape such that a second end of the slot, viewed in the longitudinal direction of the coupling piece, is spaced from the first end of the slot, the frame parts are first moved slightly apart or together in order to get the slot with the open first end in front of the projection on the frame part and then the frame parts are moved towards each other or away from each other again to open the projection at the position of to get the projection at the second end of the slot. This ensures that the coupling of the two seats is even better secured.

[0007] With regard to the assembly of two chairs coupled to each other as well as a coupling piece that fixes the two chairs relative to each other, which chairs each comprise a frame that:

- comprises on either side a foot or leg, one of which is provided with a pin and the other is provided with a recess in which the pin on a further foot or leg of the other chair is slid, thereby hooking in a horizontal direction perpendicular to the insertion direction behind a limiting edge of the recess, and
- comprises on either side a frame part which is present at a distance above the foot or leg and is coupled to the frame part of the other chair,

the invention is characterized in that:

- the recess extends from a slide-in opening in a horizontal direction parallel or almost parallel to the depth direction of the seat and thereby hooks in a

- further horizontal direction perpendicular to the horizontal slide-in direction behind the limiting edge, and the frame parts of the chairs that are close together and that are present at a distance above the feet or legs, are coupled to each other via a coupling piece that is movable relative to the frames of the chairs, wherein the coupling piece fixes the frame parts relative to each other.

[0008] The depth direction of the seat should be understood to mean the direction from the front of the chair to the rear/backrest of the chair.

[0009] The pin is preferably attached directly to the foot or leg and the recess is preferably present directly in the wall of the foot or leg or a part provided with the recess is preferably attached directly to the foot or leg.

[0010] An embodiment of the assembly is characterized in that the coupling piece is rotatably connected with one end to one of the frame parts and near the other end is provided with a slot which, in the coupled condition, with a first end extends from a lower edge of the coupling piece, and the other frame part is provided with a projection which, in coupled condition, is located in the slot.

[0011] A further embodiment of the assembly is characterized in that the slot in the coupling piece extends obliquely with respect to the lower edge or has a stepped shape such that a second end of the slot, viewed in the longitudinal direction of the coupling piece, is spaced from the first end of the slot.

[0012] The recess in the leg or foot preferably extends substantially in horizontal or substantially horizontal direction, so that when coupling the chairs have to be shifted in horizontal direction relative to each other.

[0013] In one embodiment, the coupling piece comprises a coupling strip which is hingedly connected near a first end to one of the frame parts that are near each other and which is provided near the other, second end with the slot which is stepped and extends from a lower edge of the strip in the towards the first end, wherein the other frame part is provided with a projection which is present in the slot in the coupled condition of the chairs and which hooks behind a boundary edge of the slot. Due to this stepped slot, the chairs in coupled condition can only be separated from each other by slightly moving the frame parts away from each other. This is only possible if no one is sitting on the chairs, so that the chairs cannot become detached from each other during use. Preferably, the stepped slot is in the shape of a Z with right angles.

Brief description of the drawings

[0014] The invention will be further elucidated below on the basis of drawings of exemplary embodiments of the assembly according to the invention. Hereby shows:

Figure 1 shows a front view of a first embodiment of the assembly according to the invention during the

coupling of the chairs together;

Figure 2 shows a detail at the location of the frame parts of the chairs to be coupled;

Figure 3 shows a second embodiment of the coupling for coupling the frame parts;

Figure 4 is a front view of a third embodiment of the coupling for coupling the frame parts;

Figure 5 is a top view of the coupling shown in Figure 4;

Figure 6 shows a fourth embodiment of the coupling for coupling the frame parts in front view during the coupling arrangement;

Figure 7 shows the coupling shown in Figure 6 in the coupled condition;

Figure 8 is a top view of the coupling shown in Figure 6;

Figure 9 shows a fifth embodiment of the coupling for coupling the frame parts in front view in the coupled condition;

Figure 10 is a top view of the coupling shown in Figure 9;

Figure 11 is a front view of a second embodiment of the assembly according to the invention in which parts of the front legs of the frame of the chairs are connected to each other via a slotted rotatable coupling piece;

Figure 12 shows an enlarged detail of the rotary coupling of the assembly shown in Figure 9;

Figure 13 shows a section along line XIII-XIII in Figure 12;

Figure 14 shows a left and right rear leg with rectangular cross section of the chairs shown in Figure 11 in front view;

Figure 15 shows the left hind leg shown in figure 14 provided with a recess in side view;

Figure 16 shows a left and right hind leg with round cross-section of the chairs shown in Figure 11;

Figure 17 is an alternative to the legs shown in Figure 16 with a recessed bracket attached to the left leg;

Figure 18 is connected to each other by means of specially designed coupling elements of the feet of two chairs present next to each other, wherein the feet are present at an angle to each other;

Fig. 19 by means of the coupling elements shown in Fig. 18, feet connected to each other, the feet being parallel to each other;

Figure 20 is a section along line XX-XX in Figure 19;

Figure 21 is a section along line XXI-XXI in Figure 19;

Figure 22 shows a detail of one of the coupling elements shown in Figure 19;

Figure 23 shows a detail of one of the coupling elements shown in Figure 18;

Figure 24 shows an alternative embodiment of the coupling elements shown in figures 18-23;

Figure 25 is a front view of a third embodiment of the assembly according to the invention, in which parts of the rear legs of the frame of the chairs are connected to each other via a coupling piece;

Figure 26 shows the rear part of the coupling piece present on the seats;

Figure 27 shows the front part of the coupling piece;

Figure 28 shows the coupling piece in side view in open position; and

Figure 29 shows a detail of the coupling piece in closed condition.

Detailed description of the drawings

[0015] Figure 1 shows a first embodiment of the assembly according to the invention of two chairs 103 fixed relative to each other. Each chair has a frame 105 and is provided with a seat 107 and a backrest 109. Parts of the frame are formed by feet 111 and 113 and frame parts 115 and 117 to which the backrest 109 is attached. These frame parts 115 and 117 which are spaced above the feet are coupled to each other by a coupling piece 101 and the feet are connected to each other via coupling elements 118 and 119. The coupling piece 101 is shown in detail in figure 2 and is described in more detail below. Figures 3-8 show alternative embodiments of the coupling piece. An embodiment of the coupling elements 118 and 119 of the two feet 111 and 113 is shown in figures 18-23 and will be described in more detail below.

[0016] In this embodiment, the coupling piece 101 is formed by a strip which is provided near one end with a stepped slot 125 with which the strip is slid over a projection 127 present on the frame part 115. Near the other end, the strip is connected rotatably about pin 129 to the other frame part 117. The frame part 117 is provided with a long slot in which the strip is located in vertical position. The frame part 115 is provided with a short slot 131 in which the free end of the strip is present in coupled condition. In order to be able to get this end of the strip into the slot 131, the frame parts 115 and 117 have to be moved slightly away from each other. By first coupling the two chairs 103 with the feet 111 and 113 and then rotating them away from each other in the direction of arrow a, the strip can then be rotated from the vertical position to the horizontal position shown in figure 1, indicated with arrow b. The chairs can then be brought together again, arrow c, whereby the end of the strip ends up in slot 131 and is hooked over the projection 127. Due to the stepped shape of the slot 125, the projection 127 is secured. By linking the chairs above and below, they are immovably fixed in relation to each other.

[0017] Figure 3 shows an alternative to the coupling shown in Figure 2, wherein the projection 227 is formed by the lower limiting edges of slots 231 present in a plate 229. The coupling piece 201 is provided with slots 225 with which the coupling piece hooks over the limiting edges 227. Here too, the frame parts must first be moved slightly away from each other in order to be able to insert the coupling piece 201 with the end provided with slots 225 into the slots 231 present in the plate 229.

[0018] Figures 4 and 5 show an alternative to the coupling piece shown in figure 3, wherein the coupling piece

301 has only one strip 303 which consists of two parts 303A and 303B connected to each other via a hinge 305. Furthermore, the strip 303 is slidable along a tube 307 and the strip can be fixed on the tube at any desired position by a screw 309 which is located in a slot 308 extending in the longitudinal direction of the strip 303. As a result, the length of the coupling piece 301 is infinitely adjustable. This coupling allows the coupled chairs to be coupled at an angle to each other.

[0019] Figure 6 shows a further embodiment of the coupling for coupling the frame parts in front view during the coupling arrangement. The coupling piece 401 is herein composed of two parts 403 and 405 which are connected to each other rotatably about a horizontal axis 407 and which can be fixed relative to each other by means of a rotary knob 408. By keeping the two parts 403 and 405 at the correct angle with respect to each other, the two frame parts 411 and 413 to be coupled to each other do not have to be moved away from each other when the coupling piece 401 is fitted. By rotating the parts 403 and 405 with the slots 409 over the projections 415, by rotating these parts relative to each other, the projections 415 can be brought all the way back into the slots 409, see figure 7, in which the coupling piece 401 is shown in coupled condition. In figure 8 the coupling piece 401 is shown in top view for clarification.

[0020] Figures 9 and 10 show a fifth embodiment of the coupling for coupling the frame parts in front view and top view in the coupled condition, respectively. The coupling piece 451 must first be fitted on one of the frame parts 457 and can then be rotated just as with the embodiments described above, with the difference that the frame parts 457 now have to be moved towards each other to open the slot 453 for the projection 455. to be able to get. The coupling piece 451 can be locked by turning a blocking strip 459 from the position shown in figure 10 in the direction of the arrows by turning screw 461. By stopping the blocking strip 459 so that it cannot turn any further and by turning the screw 461 further, the blocking strip 459 is moved upwards into the coupling piece 451, which is open at the bottom. The advantage of this embodiment is that if the chairs are used without need to be linked together, there is no unnecessary coupling piece attached to the chairs.

[0021] Figure 11 shows a front view of a second embodiment of the assembly according to the invention. The frames 505 of the chairs are herein provided with four legs, the rear legs 515 and 517 of which are connected to each other near the lower end by a pin present on one of the rear legs, which is hooked into a recess in the other rear leg. Figures 14 to 17 show different embodiments thereof. Frame parts 507 of the front legs 511 and 513 are coupled together near the upper ends of the front legs by a coupling piece 501.

[0022] In figure 12 the coupling of the chairs at the location of the coupling piece 501 is shown on an enlarged scale and in figure 13 the coupling piece is shown from above in a cross-section along line XIII-XIII in figure 12.

The coupling piece 501 is formed from two coupling strips 521 which are connected via a bridge piece 523 are connected to each other. Near a first end, the coupling piece is pivotally connected via a pin 525 to a frame part of one of the coupled chairs and near the other, second end, each strip is provided with a stepped slot 527 extending from a lower edge of the strip in the direction towards the first end. The frame part of the other chair is provided with a projection 529 which, in the coupled condition of the chairs 503, is present in the stepped slot 527 and hooks behind a boundary edge of the slot. The stepped slot 527 is in the shape of a Z with right angles.

[0023] In figure 14 the lower parts of a left and right leg 511, 513 with rectangular cross-section are shown, respectively. The left leg 511 is provided with a pin 535 and the right leg 513 with a recess 537. In figure 15 the right chair leg 513 provided with the recess 537 is shown in side view. This recess 537 is formed by a slot which is at a lower level than the projection 535 on the other seat, but extends upwards at the end to be level with the projection 535 on the other seat. When hooking the legs 511 and 513 together, the chair with leg 513 should be lifted slightly so that the leg 513 with the recess 537 can be slid over the pin 535. leg 513 drops down.

[0024] Figures 16 and 17 show two alternative embodiments of joined legs of chairs. Figure 16 shows a left and right leg 511A and 513A with round cross-section of a chair in side view and Figure 15 shows two legs 511B and 513B to be connected to each other, one of the legs 513B having a bracket 533B provided with a recess. is attached. The shapes of the recesses 537A and 537B and pins 535A and 535B are clearly visible here.

[0025] In order to also be able to couple chairs that are present next to each other in a curved instead of a straight row, in one embodiment of the assembly, the coupling elements with which the feet of the chairs are coupled to each other are designed in a specific manner, which is described below with reference to: figures 17-2324 is explained. Figure 18 shows herein two feet of two chairs present next to each other connected to each other via these specially designed coupling elements, wherein the feet are present at an angle to each other. Figure 19 shows two feet connected to each other by the coupling elements shown in Figure 18, the feet being arranged parallel to each other. In order to clarify these coupling elements 615 and 617, the coupling of the feet is shown in figure 20 in a section along line XX-XX and in figure 21 along line XXI-XXI and in figure 22 a detail of the couplings shown in figure 19 is shown. and in figure 23 a detail of the couplings shown in figure 18 is shown.

[0026] One of the coupling elements 615 is provided with a pin 621 and the other coupling element 617 with a recess 619. The recess is elongate and extends in a horizontal plane in a direction parallel to the depth direction of the seat or transverse to the width direction of the seat. The recess is open at both ends, one of the ends forming a slide-in opening into which the pin of the chair to be coupled can be inserted. The recess 619 is tapered

so that the pin 621 can rotate in the recess 619 through a limited angle. This allows the feet 611 and 613 are angled to each other. In that case, the feet 611 and 613 of the chairs can of course only be coupled to each other in one place (instead of in two places).

[0027] Figure 24 shows an alternative embodiment of the coupling elements shown in figures 18-23 for coupling two feet 659 of adjacent chairs. One of the coupling elements 651 is designed as a plate to which a pin 653 is attached and the other coupling element 655 is designed as a plate in which a slot 657 is present. At the end of the pin 653 is a radially projecting flange so that the pin is longitudinally locked in the slot. These coupling elements are welded to the feet of the chairs instead of clamped to the feet as in the embodiment shown in figures 18-23.

[0028] Figure 25 shows a third embodiment of the assembly according to the invention in front view, in which parts of the rear legs 715 and 717 of the frame 705 of the chairs 703 are connected to each other via a coupling piece 701. The frame 705 of the chairs 703 furthermore has two front legs 711 and 713. The front leg 711 and 713 respectively are located on the left and right side. 713 and the hind leg 715 resp. 717 via a foot 707 resp. 709 (thin rod or tube) connected together. The feet are provided with coupling elements that are coupled to each other.

[0029] In figures 26-29 the coupling piece is shown in detail, in figure 26 the rear part 721 of the coupling piece present on the rear legs 715 and 717 of the chairs is shown and in figure 27 the front part 723 of the coupling piece is shown. In figure 28 the coupling piece 701 is shown in side view in open condition and figure 29 shows a detail of the coupling piece 701 in closed condition. The rear and front parts 721 and 723 are connected to each other via a screw 725 whereby the front part 723 can pivot away from the rear part 721 through a limited angle to allow the coupling piece 701 to be fitted over the rear legs 715 and 717. The rear part 721 is provided on the sides with two side walls 727 and at a distance from these side walls is a preferably plastic block 729 against the eight side 731. In this plastic block 729 there is a hole 733 in which a hook 735 of the front part is provided. 721 is present and hooks behind the plastic block 729. In the plastic block 729 there is furthermore a magnet 737 to better keep the front part 723 in closed position.

[0030] Although the present invention is elucidated above on the basis of the given drawings, it should be noted that this invention is not limited whatsoever to the embodiments shown in the drawings. The invention also extends to all embodiments deviating from the embodiments shown in the drawings within the scope of the invention defined by the appended claims.

Claims

1. A method of coupling two seats (103; 503; 703), each

comprising a frame (105; 505; 705) that:

- comprises a foot (111, 113; 511, 513; 611, 613; 707, 709) or leg (511-517) on either side of the chair, one of which is provided with a pin (621) and the other is provided with a recess (619) into which a pin on a further foot or leg of a further chair can slide, thereby hooking behind a boundary wall of the recess, and
- on either side of the chair a frame part (107; 507) is provided that is present at a distance above the foot or leg,

in which method:

- the pin (621) on the foot (111, 113; 511, 513; 611, 613; 707, 709) or leg (511-517) of one of the chairs (103; 503; 703) is slid in the recess (619) off the other seat, and
- one of the frame parts (107; 507) of one of the seats (103; 503; 703) is coupled to one of the frame parts (107; 507) of the other seat,

characterized in that when the two seats (103; 503; 703) are coupled:

- the two seats (103; 503; 703) are placed next to and against each other with one seat protruding forward relative to the other seat, and then the two seats are shifted relative to each other such that the pin (535; 621; 653) on one foot (613) or leg (511) of the chairs is slid into the recess (537; 619) present in the further foot (611) or leg (513) of the further chair and thereby hooks behind the wall of the recess (107; 507; 537; 619; 657), and
- the frame parts (107; 507) of the chairs present near each other and which are present at a distance above the feet or legs are coupled to each other via a coupling piece (101; 501; 701), wherein the coupling piece fixes the frame parts immovably with respect to each other.

2. Method as claimed in claim 1, **characterized in that** the coupling piece is rotatably connected with one end to one of the frame parts and near the other end is provided with a slot which, in the coupled condition, with a first end extends from a lower edge of the coupling piece, and the other frame part is provided with a protrusion which is in the slot in the coupled condition, wherein in the method the frame parts are first moved slightly apart and then towards each other again or vice versa to get the protrusion (127; 227; 415; 455; 529) on the frame part into the slot (125; 225; 409; 453; 527) in the coupling piece.
3. Method according to claim 2, **characterized in that** the slot in the coupling piece extends obliquely with

respect to the lower edge or has a stepped shape such that a second end of the slot, viewed in the longitudinal direction of the coupling piece, is spaced from the first end of the coupling piece, and the frame members are first moved slightly apart or together to get the slot (125; 225; 409; 453; 527) with the open first end in front of the projection (127; 227; 415; 455; 529) on the frame part and then the frame parts are again moved towards each other or away from each other in order to get the projection at the location of the second end of the slot.

4. Assembly of at least two chairs (103; 503; 703) present next to each other, as well as a coupling piece (101; 501; 701) that fixes both chairs relative to each other, which chairs are each provided with a seat (107) with a width and a depth and a back (109), and which seats each comprise a frame (105; 505; 705) which:

- comprises on either side a foot (111, 113; 611, 613; 707, 709) or leg (511-517), one of which is provided with a pin (535; 621) and the other is provided with a recess (537; 619) in which the pin on a further foot or leg of the other chair is slid, thereby hooking in a horizontal direction perpendicular to the insertion direction behind a limiting edge of the recess, and
- comprises on either side a frame part (107; 507) which is present at a distance

above the foot or leg and is coupled to the frame part (107; 507) of the other chair, **characterized in that:**

- the recess (537; 619) extends from a slide-in opening in a horizontal direction parallel or almost parallel to the depth direction of the seat and thereby hooks in a further horizontal direction perpendicular to the horizontal slide-in direction behind the limiting edge, and
- the frame parts (107; 507) of the chairs that are close together and that are present at a distance above the feet or legs, are coupled to each other via a coupling piece (101; 501; 701) that is movable relative to the frames of the chairs, wherein the coupling piece fixes the frame parts relative to each other.

5. Assembly according to claim 4, **characterized in that** the pin (535; 621) is mounted directly on the foot (613) or leg (511) and **in that** the recess (537; 619) is present directly in the wall of the foot (611) or leg (513) or a part in which the recess is present is attached directly to the foot or leg.
6. Assembly according to claim 4 or 5, **characterized in that** the coupling piece is rotatably connected with one end to one of the frame parts and near the other

end is provided with a slot which, in the coupled condition, with a first end extends from a lower edge of the coupling piece, and the other frame part is provided with a projection which, in coupled condition, is located in the slot.

5

7. Assembly according to claim 6, **characterized in that** the slot in the coupling piece extends obliquely with respect to the lower edge or has a stepped shape such that a second end of the slot, viewed in the longitudinal direction of the coupling piece, is spaced from the first end of the coupling piece.
- 10
8. Assembly as claimed in claim 6 or 7, **characterized in that** the coupling piece comprises a coupling strip which is hingedly connected near a first end to one of the frame parts (107; 507) present near each other and which is provided near the other, second end with the slot (125; 225; 409; 453; 527) which is stepped and extends from a lower edge of the strip toward the first end, the other frame member having a projection (127; 227; 415; 455; 529) which is present in the slot when the seats are coupled and which hooks behind a boundary edge of the slot.
- 15
- 20
- 25
9. An assembly according to claim 8, **characterized in that** the stepped slot (125; 225; 409; 453; 527) is in the shape of a Z with right angles.

30

35

40

45

50

55

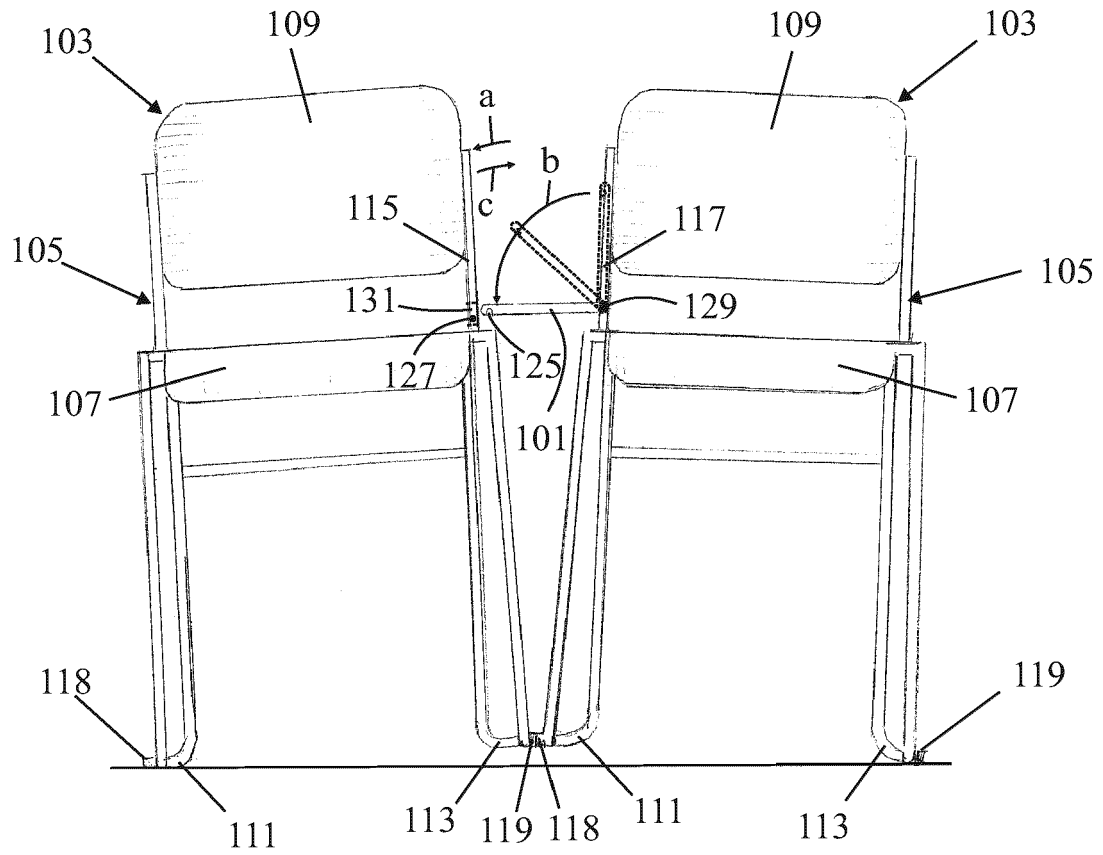


FIG. 1

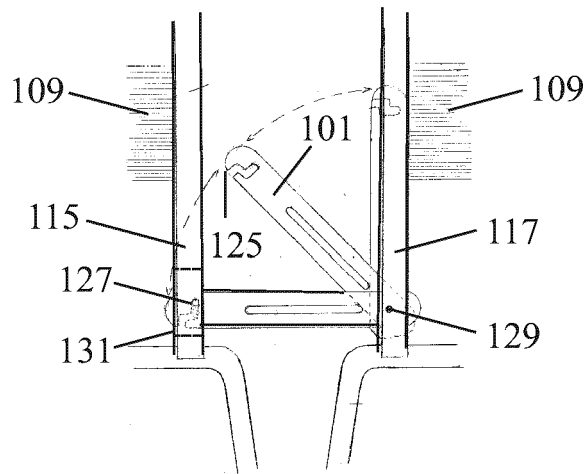


FIG. 2

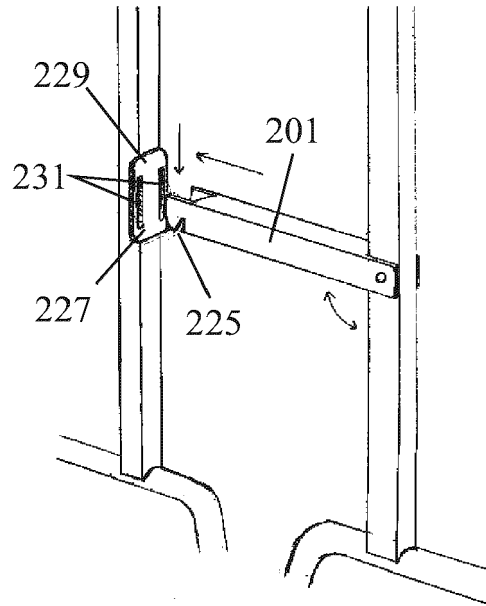


FIG. 3

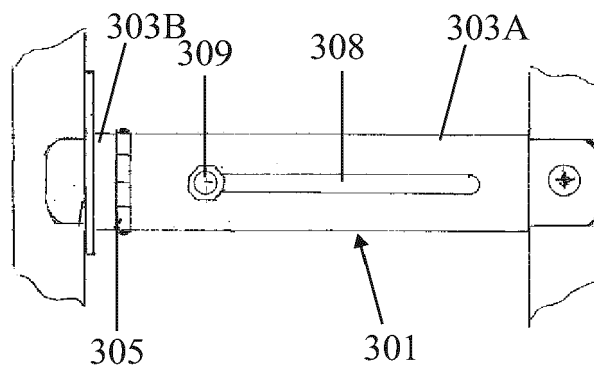


FIG. 4

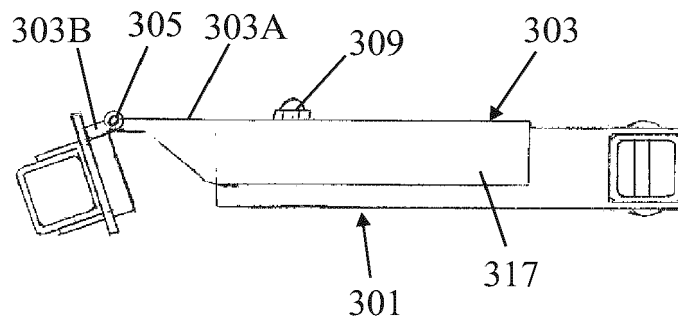


FIG. 5

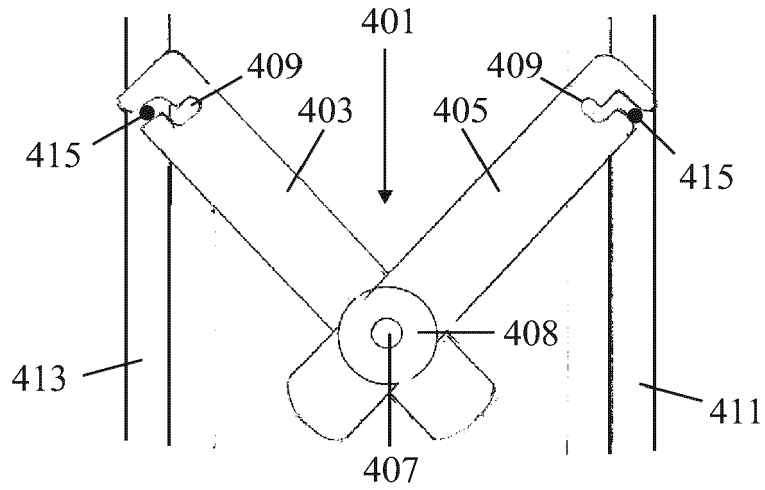


FIG. 6

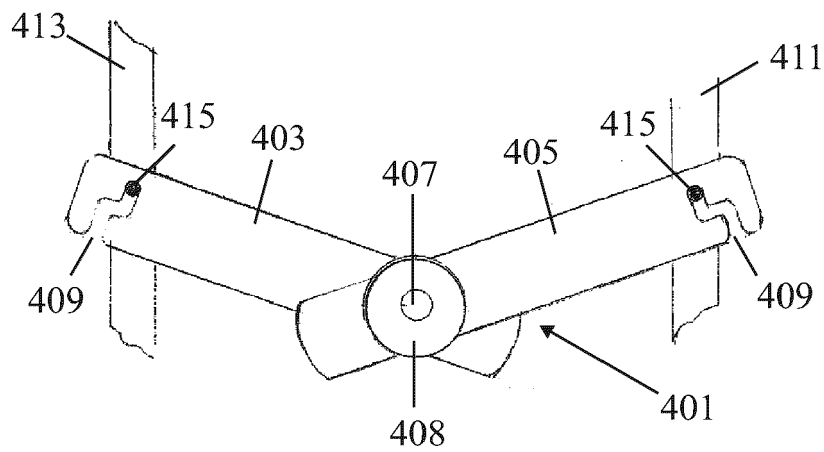


FIG. 7

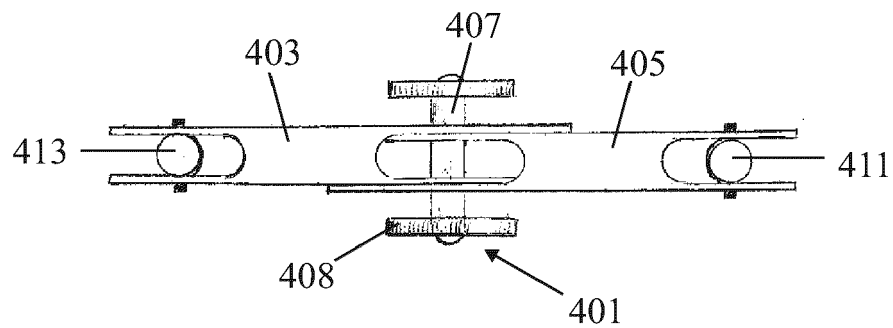


FIG. 8

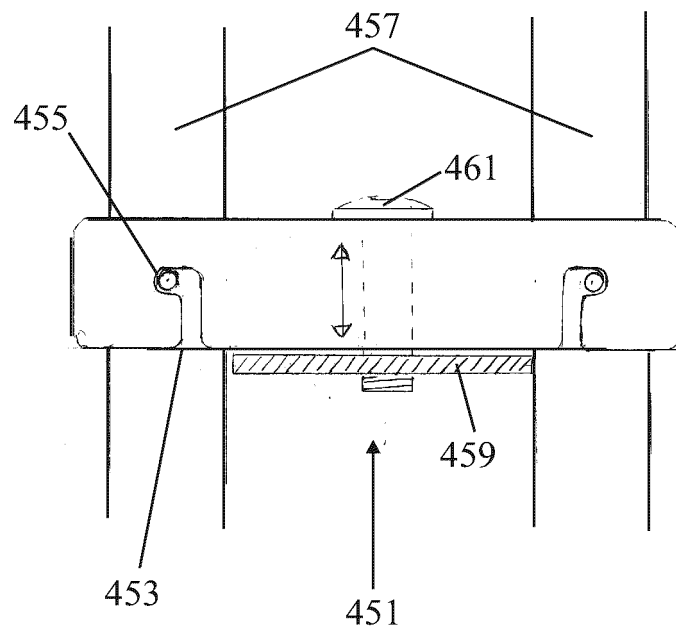


FIG. 9

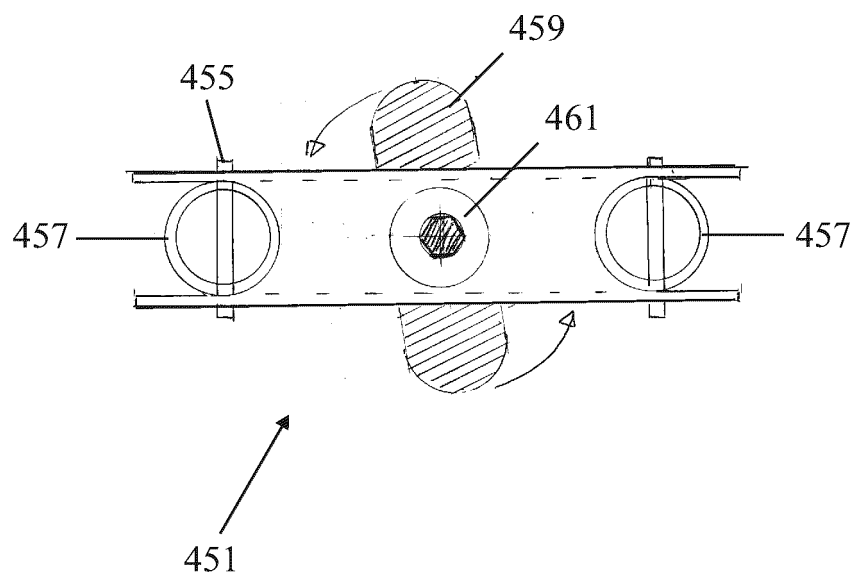


FIG. 10

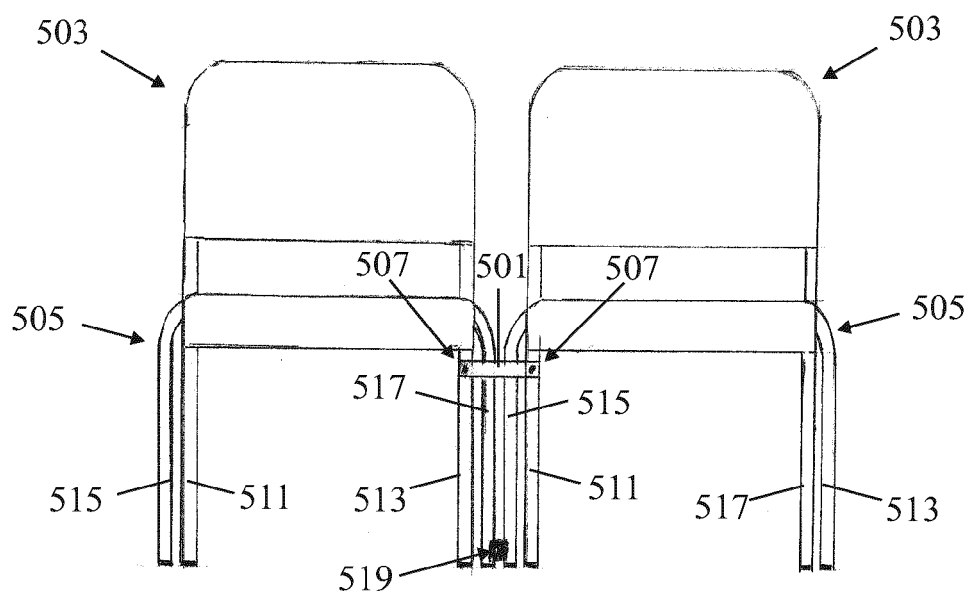


FIG. 11

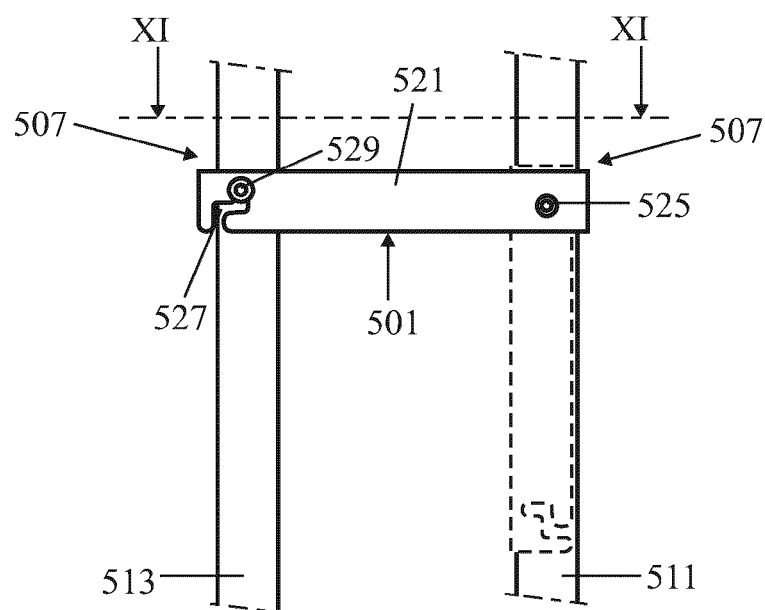


FIG. 12

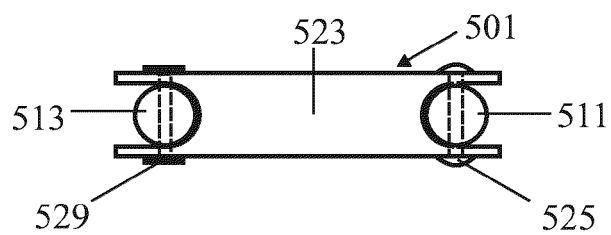


FIG. 13

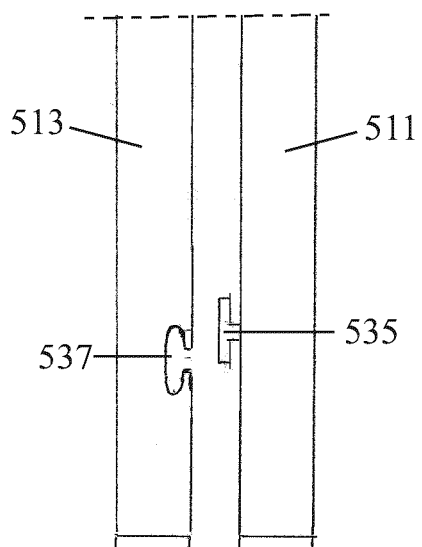


FIG. 14

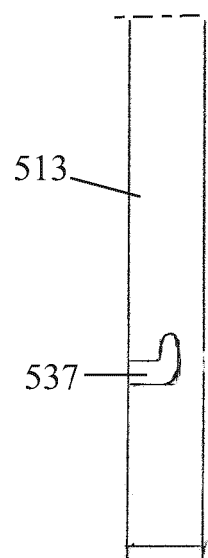


FIG. 15

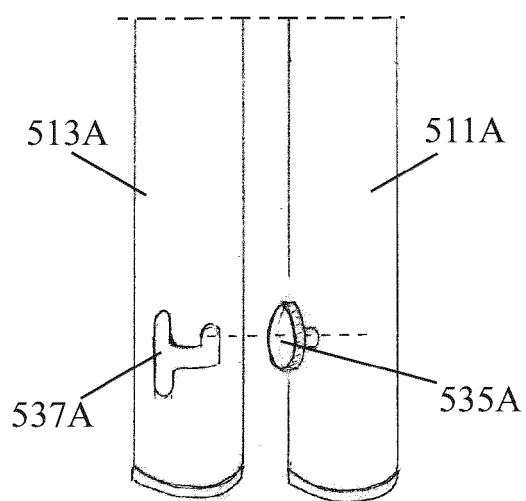


FIG. 16

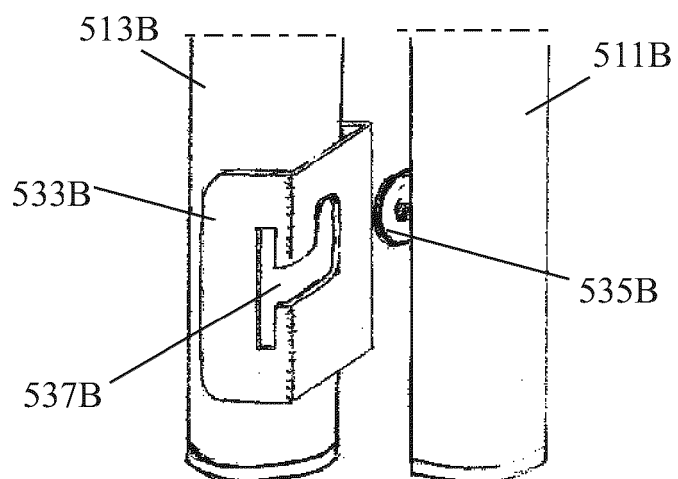


FIG. 17

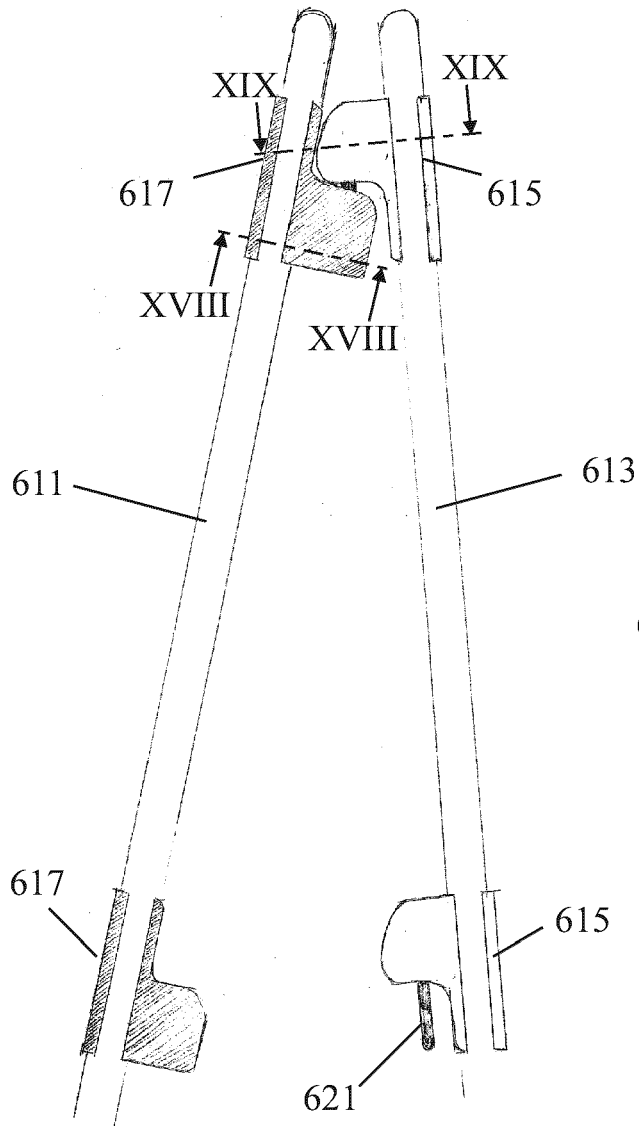


FIG. 18

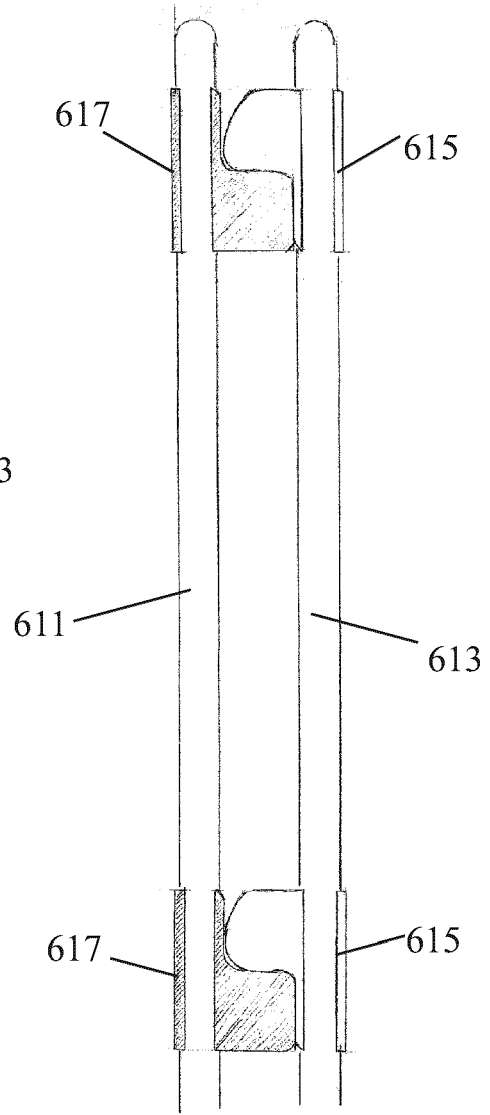


FIG. 19

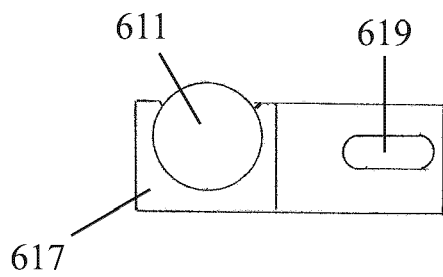


FIG. 20

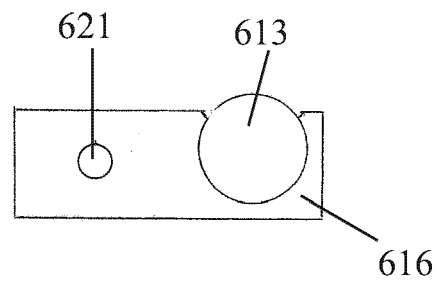


FIG. 21

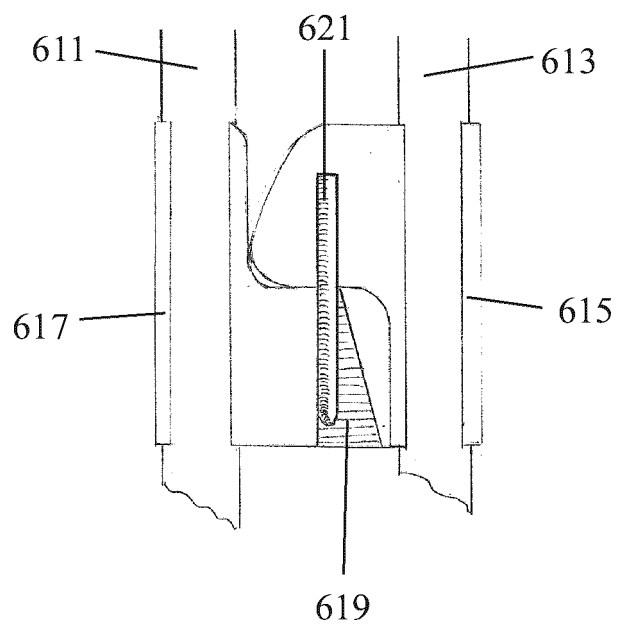


FIG. 22

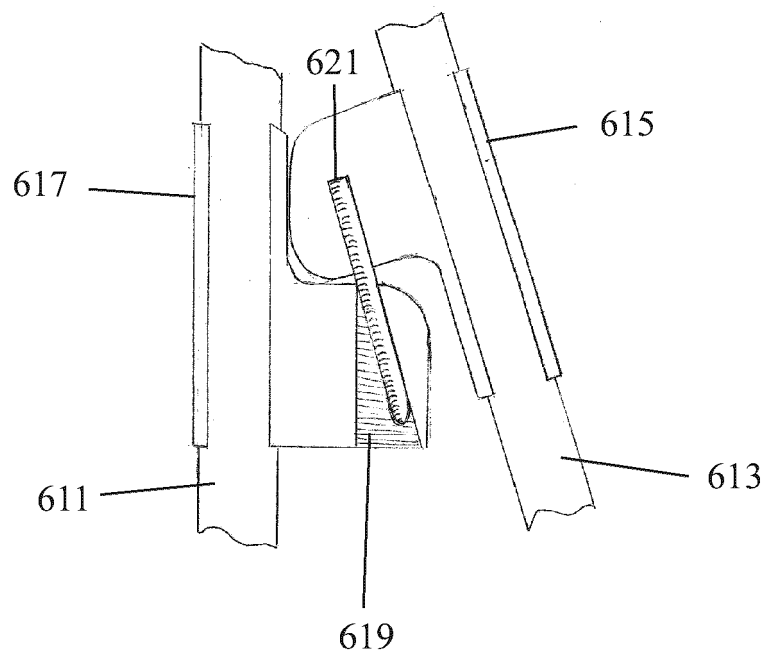


FIG. 23

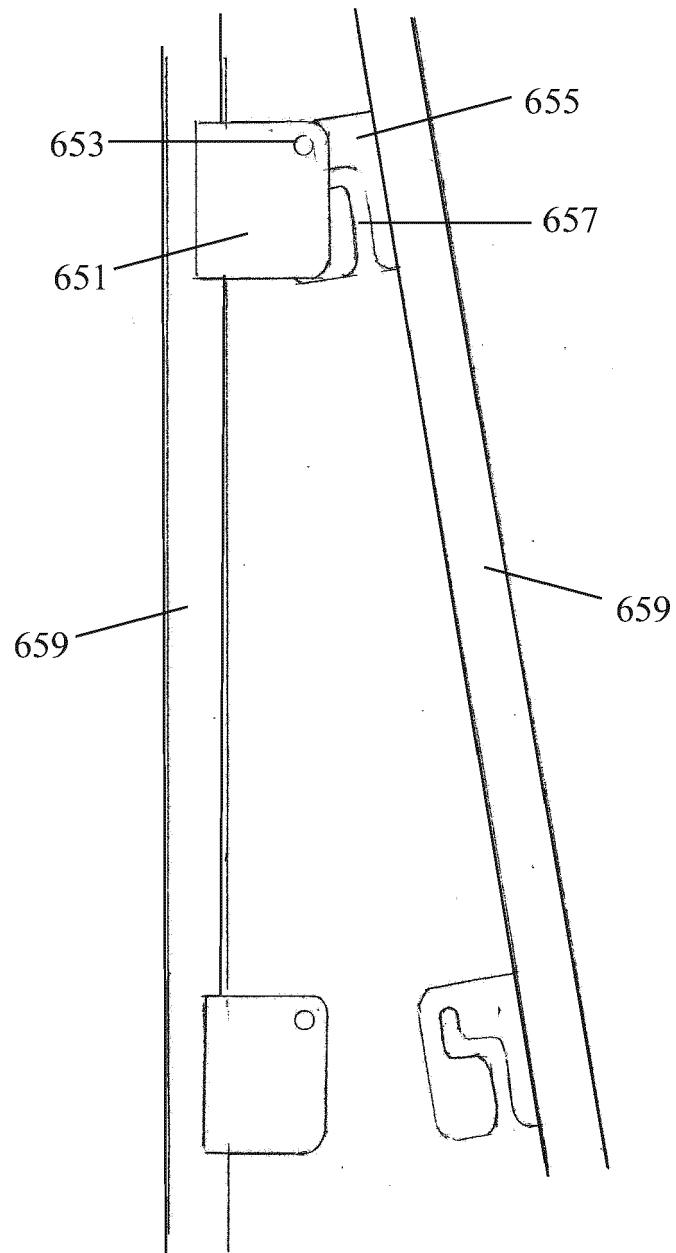


FIG. 24

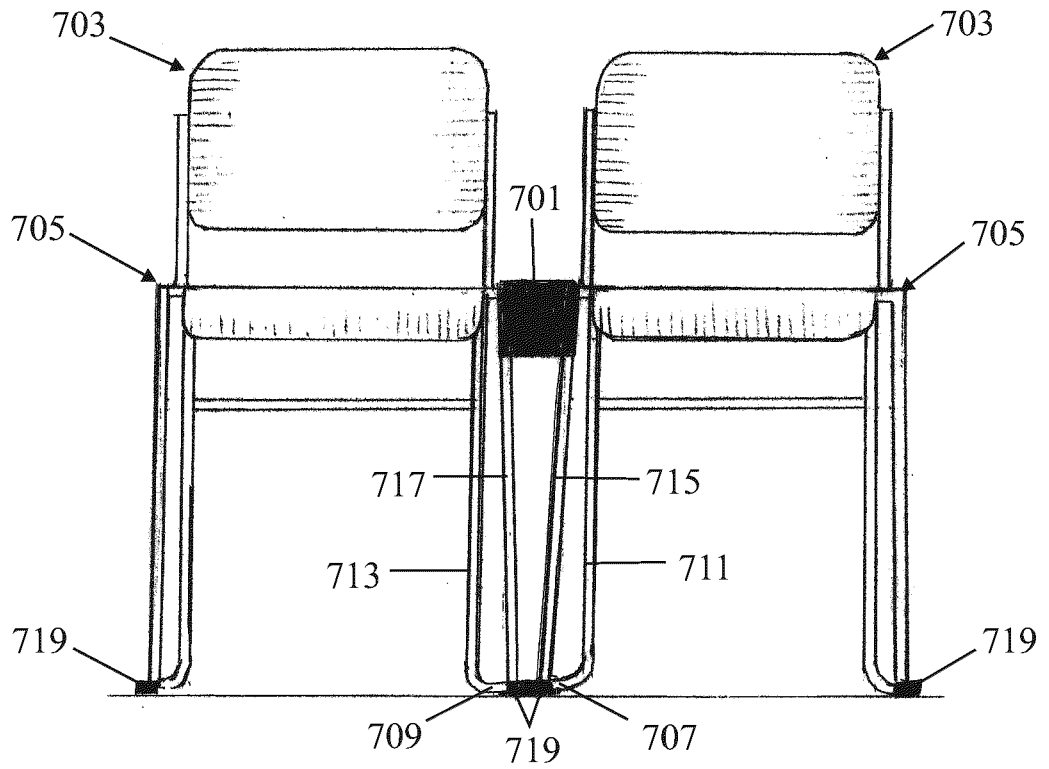


FIG. 25

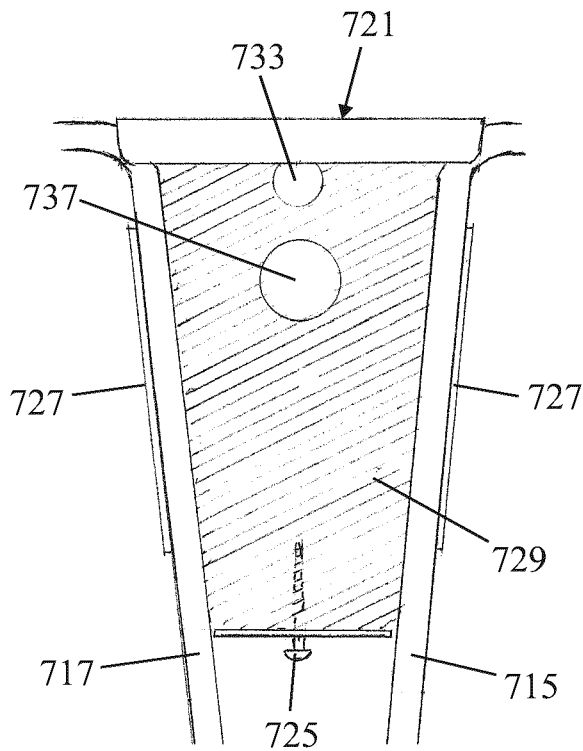


FIG. 26

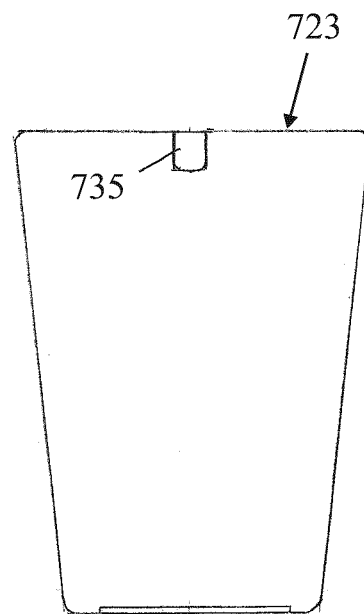


FIG. 27

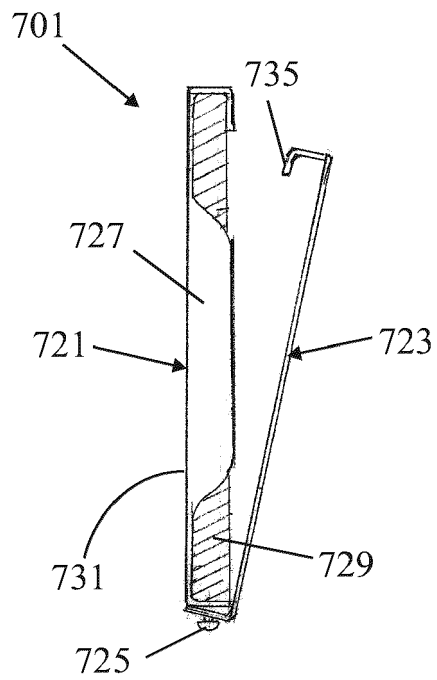


FIG. 28

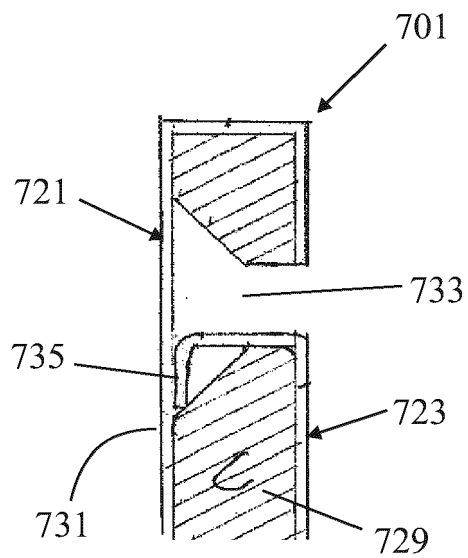


FIG. 29



EUROPEAN SEARCH REPORT

Application Number
EP 21 18 4884

5

10

15

20

25

30

35

40

45

50

55

5

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 614 157 A (HENDRICKSON PHILIP J ET AL) 19 October 1971 (1971-10-19) * figures *	1-9	INV. A47C1/124
A	GB 2 094 139 A (MIDLAND REPETITION CO LTD) 15 September 1982 (1982-09-15) * figures *	1-9	
A	DE 439 312 C (KIEKERT SOEHNE ARN) 8 January 1927 (1927-01-08) * figures *	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 November 2021	Examiner Kis, Pál
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 18 4884

5

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-11-2021

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3614157	A	19-10-1971	NONE
GB 2094139	A	15-09-1982	NONE
DE 439312	C	08-01-1927	NONE

15

20

25

30

35

40

45

50

55

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 3614157 A [0002]