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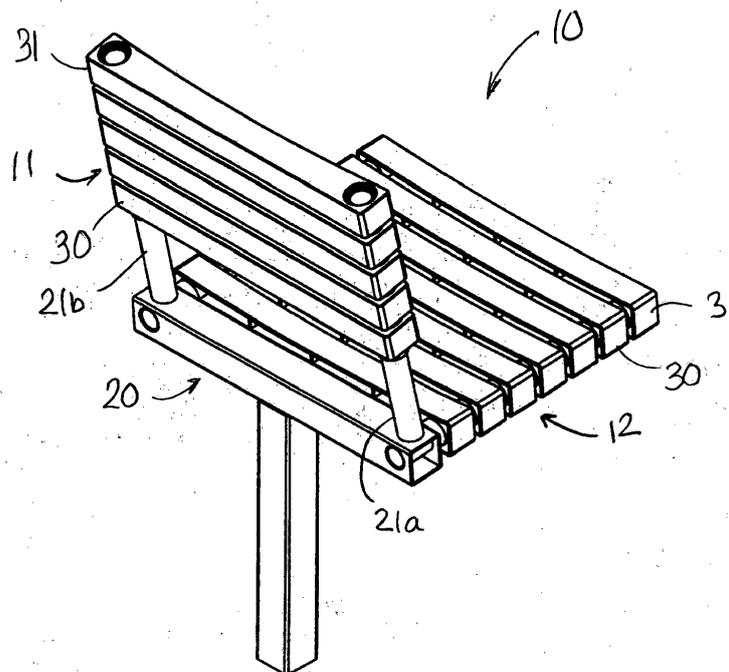
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(54) **A SEAT**

(57) A seat (10), the frame of whose backrest (11) and/or seat part (12) includes at least two tubes (21a, 21 b, 22a, 22b) or bars, in conjunction with which structural parts (30, 31), which have holes (32) for the tubes of the frame of the backrest and/or the frame of the seat part, can be installed. The structural part has, in conjunction

with the hole, a shoulder (33) on which the bushing (34) of the adjacent structural part rests. The structural parts can be in contact with one another or there can be a gap between them. The structural part has been made of wood or plastic, and there can be a padding (35) on top of them.



**FIG. 1**

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## Description

**[0001]** The object of the invention is a seat according to the preamble to claim 1.

**[0002]** The purpose of the invention is to create a seat that can be assembled from simple and low-cost parts.

**[0003]** The seat according to the invention is characterized in what has been presented in the characteristics section of claim 1. Most preferably, the seat has been formed from structural parts that are installed in conjunction with tubes, bars or similar belonging to the seat frame. The structural parts are, for example, plastic, or injection moulded from plastic, or similar.

**[0004]** In the following, the invention is described using examples with reference to the appended drawings, in which

## LIST OF FIGURES

### [0005]

- Fig. 1 shows an oblique side view of a seat according to the invention.
- Fig. 2 shows an oblique side view of another seat according to the invention.
- Fig. 3 shows the seat of Fig. 2 with the seat part turned up.
- Fig. 4 shows a direct side view of the seat according to the invention.
- Fig. 5 shows the seat of Fig. 4 with the seat part turned up.
- Fig. 6 shows an oblique side view of the frame of the seat according to the invention.
- Fig. 7 shows the frame of the seat of Fig. 6 with the seat part turned up.
- Fig. 8 shows a sectional view of the backrest of the seat according to the invention.
- Fig. 9 shows a sectional view of the seat part of the seat according to the invention.
- Fig. 10 shows a structural part of the seat according to the invention.
- Fig. 11 shows the structural part of Fig. 10 seen from the opposite side.
- Fig. 12 shows a structural part of the seat according to the invention.
- Fig. 13 shows a partial view of a seat according to the invention.
- Figs. 14 and 15 show structural parts of the seat according to the invention.
- Fig. 16 shows the frame of the seat part of the seat according to the invention.
- Fig. 17 shows the seat part of the seat according to the invention.
- Fig. 18 shows a side view of a seat frame which has been attached to a wall and which has a seat part frame according to Fig. 16.
- Fig. 19 shows a side view of a seat which has been attached to a wall and which has a seat part

according to Fig. 17.

Fig. 20 shows the frame of a seat according to Fig. 18, in which the seat part frame is in the lower position.

5 Fig. 21 shows the seat according to Fig. 19 with the seat part turned down.

## DESCRIPTION OF THE FIGURES

10 **[0006]** Fig. 1 shows an example of a seat 10 according to the invention, in which structural parts 30 according to the invention have been used in both the backrest 11 and the seat part 12. In the example of Fig. 1, the structural parts 30 are essentially identical parts with two holes such that the structural parts 30 can have been inserted and placed next to one another into the tubes 21 a and 21 b or to corresponding bars located in the seat frame 20. The holes of the structural parts 31 placed outermost in both the backrest 11 and the seat part 12 can be covered with plugs such that their holes will not remain visible. The outermost structural parts 31 can also be otherwise identical with the structural parts 30, but they do not have a through-hole.

20 **[0007]** From Fig. 1 it can be seen that in the chair 10, between the structural parts 30, there is a small gap that has been achieved such that the structural parts 30 have bushing-like parts in conjunction with the holes. The bushing-like parts can be formed fixedly in the structural parts 30 and/or 31 or loose bushings are placed between the structural parts during the installation phase. The structure of the seat frame 20 and the structural parts 30 are described in more detail hereinafter.

25 **[0008]** Figs. 2-5 show a schematic view of a seat 10 according to the invention, the seat part 12 of which can be turned up when the seat is not occupied. For that, the seat part 12 has been attached to the seat frame 20 with a hinge 25. From Figs. 2-5 it can be seen that in this example, both the backrest 11 and the seat part 12 of the seat 10 has been formed from structural parts 30 and corresponding structural parts 31 without through-holes, that form the end pieces.

30 **[0009]** Figs. 6 and 7 show the frame 20 of the seat according to the invention, in which the frame of the backrest 11 has a beam 23 and, attached thereto, tubes 21 a and 21 b or corresponding bars. The frame of the seat part 12 has a beam 24 and, attached thereto, tubes 22a and 22b or corresponding bars. The beam 24 of the seat part 12 has been attached to the beam 23 of the backrest 11 with a hinge 25, which makes it possible to turn the seat part 12 up when the seat is not occupied.

35 **[0010]** If there is no need for the seat part 12 of the seat 10 to be lifted up, as in the examples shown in Figs. 2-7, the frame of the seat part 12 can be made such that it is fixedly attached to the frame of the backrest 11, as in Fig. 1.

40 **[0011]** Fig. 8 shows, as a sectional view, how the structural parts 30 form the backrest 11 of the seat 10. From Fig. 7 it can be seen that the structural parts 30 are placed

such that the tubes of the frame of the backrest 11 go through the holes of the structural part 30. The sectional view of Fig. 8 shows the structural parts 30 of the second tube 21 a of the backrest 11, which have, in conjunction with the hole, a guide bushing 34 to facilitate the installation of the structural part. The structural parts 30 of the backrest 11 rest on one another such that the bushing 34 belonging to the structural part 30 partly penetrates into the hole of the structural part 30 until the bushing 34 touches the shoulder 33 located in the hole. In Fig. 8, due to the length of the bushing 34, the outer edges of the adjacent structural parts 30 do not touch one another, leaving a gap between the structural parts 30. If no gap is required between adjacent structural parts 30, the bushing 34 can be made shorter.

**[0012]** Fig. 8 also shows the structural part 31 without through-holes to be installed last to the tube 21 a of the frame of the backrest 11. The structural part 31 is installed in place such the tube 21 a is pushed until it touches the bottom of the aperture located in the structural part 31. However, it is also possible to use, as the structural part to be installed last, the same kind of structural part 30 as elsewhere in the seat 10. In this case, a plug covering the hole is placed in the hole of the structural part 30, which plug can also be used, if needed, to immobilise the structural part to be installed last. For the immobilisation, a rivet, pin or screw can also be used to lock the structural part 30 to the tube 21 a of the frame.

**[0013]** Fig. 9 shows a sectional view of the assembly corresponding to Fig. 8 of the seat part 12 of the seat 10. Most advantageously, the same kind of structural parts 30 and 31 are used in the seat part 12 as in the backrest of the seat 10.

**[0014]** Fig. 10 shows a structural part 30 according to the invention of the seat 10, which structural part has two holes 32 and, in conjunction with the holes, bushings 34. The structural part 30 can be made of, for example, wood, metal, plastic or other similar material. Most advantageously, however, the structural part 30 is manufactured from plastic, because then it can be readily manufactured, for example, by injection moulding, to make it sufficiently lightweight and weatherproof. The structural part 30 of Fig. 10 is hollow inside and contains bushings 34 for the installation, which is presented in Figs. 8 and 9.

**[0015]** Fig. 11 shows the structural part 30 of Fig. 10 seen from the opposite side. Fig. 10 shows the hole 32 of the structural part 30 and, in conjunction with it, the shoulder 33 on which the bushing 34 of the adjacent structural part 30 rests. The holes 32 and the bushings 34 of the structural part 30 shown in Figs. 10 and 11 can also be made slightly conical, in which case these parts lock more closely into each other during assembly.

**[0016]** The structural part 31 to be used outermost in both the backrest 11 and the seat part 12 and to be installed last corresponds with the structural part 30 shown from the other side in Fig. 9. However, the structural part 31 does not have a through-hole 32 and a shoulder 34, as in the structural part 30 of Fig. 10.

**[0017]** Fig. 12 shows a structural part 30 of the seat 10 according to the invention, which structural part is curved in shape. When such structural parts 30 are used, both the backrest 11 and the seat part 12 can also be made curved and cup-like, which are more comfortable when sitting than a straight backrest 11 and a straight seat part 12.

**[0018]** Fig. 13 shows a sectional partial view of the installation of the seat 10 according to the invention. Fig. 13 shows one backrest 11 and one curved structural part 30 to be installed in conjunction with the tubes 22a and 22b of the seat part 12.

**[0019]** Figs. 14 and 15 show structural parts 30 of the seat according to the invention, to which a padding 35 has been added. In Fig. 14, the padding is made of, for example, soft plastic, such as polyurethane, which has been attached to the surface of the structural part 30 by, for example, gluing. In order for the padding 35 to stay better in place, a recess 36 has been formed in the upper surface of the structural part 30 for the padding 35.

**[0020]** In Fig. 15, the structural part 30 of the seat according to the invention has been coated with a coating 37. This has been achieved, for example, such that the structural part 30 has been immersed in a liquid substance 37, which, when it dries, forms a protective surface layer on the surface of the structural part 30. In Fig. 15, the coating 37 can be made thicker at its upper surface, in which case it simultaneously forms a padding 35 on the upper surface of the structural part 30.

**[0021]** Fig. 16 shows the frame of the seat part 12 of the seat according to the invention, in which frame the hinge 25 is not at the edge of the seat part 12, as is shown in Figs. 2-7, but closer to the centre part of the seat part 12. Thanks to this arrangement, the seat rises up due to the effect of gravity when the seat is not occupied. Fig. 17 shows the seat part 12 of the seat according to the invention, in which seat the structural parts 30 have been placed in the tubes 22a and 22b of the frame of the seat part 12.

**[0022]** Figs. 18 and 20 show a side view of a seat frame which has been attached to, for example, the tiered wall 40 of a seating area of a sports arena and which has a seat part frame according to Fig. 16. In Fig. 18, the seat part is in the upper position and in Fig. 20 in the lower position.

**[0023]** Figs. 19 and 21 show, correspondingly in different positions, a finished seat 10, in which the structural parts 30 and 31 are in place. As described above, the last structural part 31 can also be replaced by a structural part 30, whose holes have been covered with plugs. In Fig. 19, the seat part 12 of the seat 10 has been, due to the effect of gravity, automatically turned to the upper position and in Fig. 20, the seat part 12 of the seat 10 is in the lower position, i.e. when a person is seated on the seat.

**[0024]** In Figs. 18-20, the seat 10 has been attached to, for example, the tiered wall 40 of a seating area of a sports arena such that several chairs 10 have been at-

tached to the beam 26. The seats 10 attached to the beam 26 form a module which can be installed onto the wall 40 quickly in one piece, which considerably speeds up the installation work.

[0025] The number of seats 10 in the module is only limited by the weight of the module and the stability of the structure. However, the modules must be easy to handle and easy to transport to the installation site. In practice, an advantageous module size is, for example, three seats 10. For the duration of the transport, the seat parts of the seats can be detached from the modules, thus reducing their weight.

[0026] The drawings show examples of chairs 10 which have two tubes 21a and 21b for the backrest 11 and two tubes 22a and 22b for the seat part 12. This is an advantageous solution when the seat 10 is meant to seat one person. However, if the seat must withstand a greater weight or if the seat is made into a bench for two or more people, three or more tubes or bars can be used in both the backrest 11 and the seat part 12. Correspondingly, the size of the structural parts 30 changes and/or becomes longer.

[0027] The material, length and shape of the structural parts 30 and/or 31 of the seat 10 according to the invention can vary. In the examples presented above, the structural parts 30 are essentially identical, because this eliminates the need for several different moulds in production. However, according to the invention, there can be several different structural parts 30, which can be combined into different chairs of different shapes and/or sizes. In that case, the size and shape of the cross section of the structural part 30 can also vary.

[0028] The shape and size of the cross section of the tubes or bars 21 a, 21 b, 22a, 22b of the backrest 11 and the seat part 12 of the seat 10 can also vary. The tubes or bars can be, for example, round, rectangular or flat.

[0029] The manufacturing material of the structural parts 30 and/or 31 of the seat 10 can be, for example, plastic, injection moulded plastic, wood or similar material. The plastic parts can also contain flame-retardant compounds. Paddings or coatings can be attached to the structural parts 30 and/or 31. If required, armrests can also be attached to them.

#### LIST OF REFERENCE NUMBERS

##### [0030]

10	Seat
11	Seat backrest
12	Seat part of the seat
20	Seat frame
21a	Tube

21b	Tube
22a	Tube
22b	Tube
23	Beam
24	Beam
25	Hinge
26	Beam
30	Structural part
31	Structural part
32	Hole
33	Shoulder
34	Bushing
35	Padding
36	Recess
37	Coating
40	Wall

#### Claims

1. A seat (10), **characterized in that** the frame of the backrest (11) and/or the frame of the seat part (12) of the seat (10) include at least two tubes (21 a, 21 b, 22a, 22b) or bars, in conjunction with which structural parts (30, 31), which have holes (32) for the tubes or bars of the frame of the backrest and/or the frame of the seat part, can be installed.
2. A seat (10) according to claim 1, **characterized in that** the structural part (30, 31) of the seat (10) has, in conjunction with the holes (32), bushings (34) which rest on the adjacent structural part.
3. A seat (10) according to claim 1 or 2, **characterized in that** the structural part (30) of the seat (10) has, in conjunction with the hole (32), a shoulder (33) on which the bushing (34) of the adjacent structural part rests.
4. A seat (10) according to claim 1, 2 or 3, **characterized in that** the structural parts (30, 31) of the seat (10) are in contact with one another or there is a gap between the structural parts.

- 5. A seat (10) according to any one of claims 1-4, **characterized in that** the hole (32) in the structural part to be placed at the edge of the backrest (11) and/or the seat part (12) of the seat (10) and to be installed last has been covered with a plug. 5
  
- 6. A seat (10) according to any one of claims 1-4, **characterized in that** the surface of the structural part to be located at the edge of the backrest (11) and/or the seat part (12) of the seat (10) and to be installed last is solid without a hole (32). 10
  
- 7. A seat (10) according to any one of claims 1-6, **characterized in that** the tubes (22a, 22b) of the seat part (12) of the seat (10) have been attached to the frame of the seat such that the seat turns up due to the effect of gravity when the seat is not occupied. 15
  
- 8. A seat (10) according to any one of claims 1-7, **characterized in that** the structural part (30, 31) of the seat (10) has been made of wood, plastic, injection moulded plastic or similar material. 20
  
- 9. A seat (10) according to any one of claims 1-8, **characterized in that** a padding (35) has been attached to the structural part (30, 31) of the seat (10) and/or the structural part has been coated with a coating layer (37). 25
  
- 10. A seat (10) according to any one of claims 1-9, **characterized in that** two or more seats (10) or seat frames equipped with tubes (21 a, 21 b, 22a, 22b) and structural parts (30, 31) have been attached to a beam (26) such that the seats form a module that can be installed in one piece. 30  
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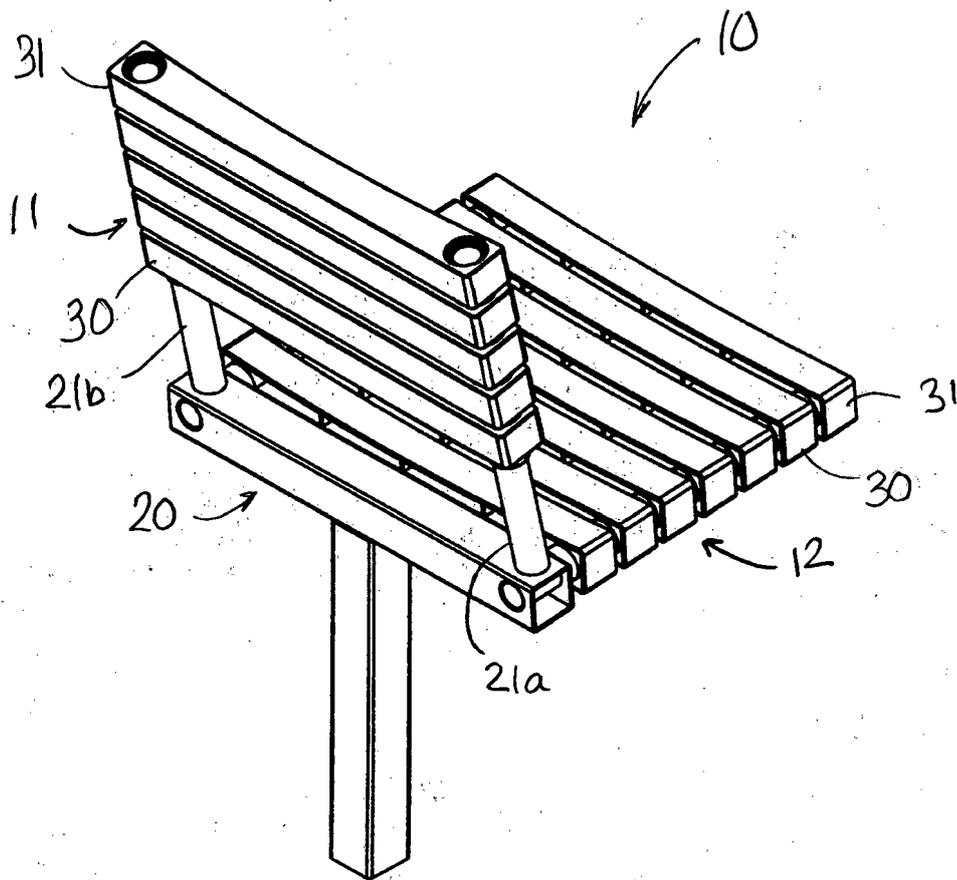
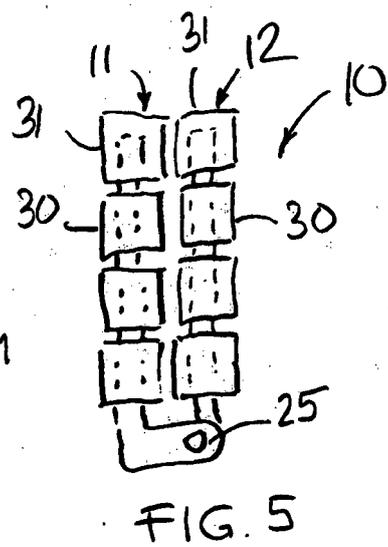
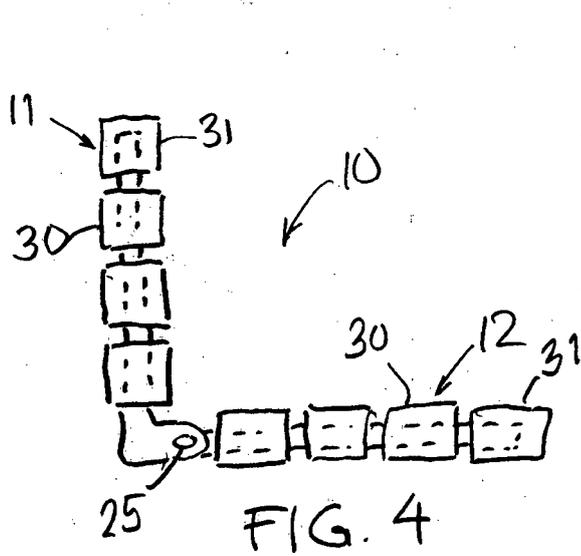
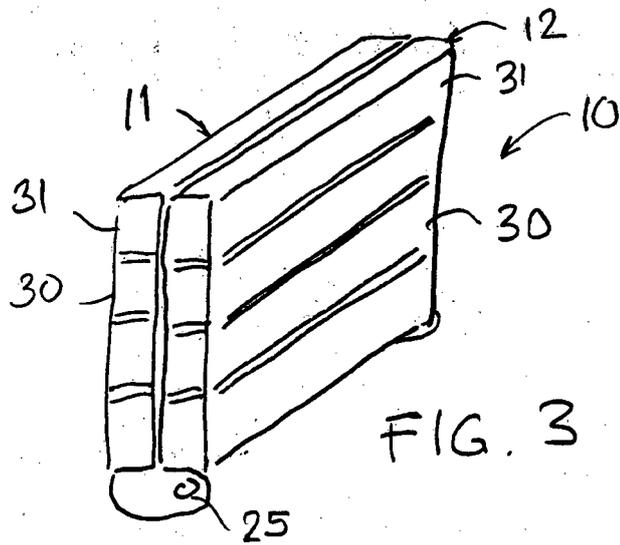
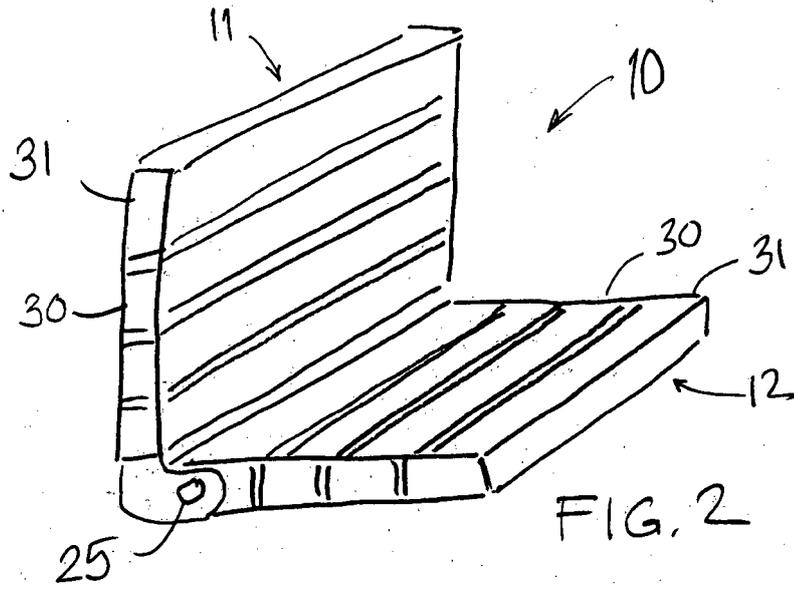


FIG. 1



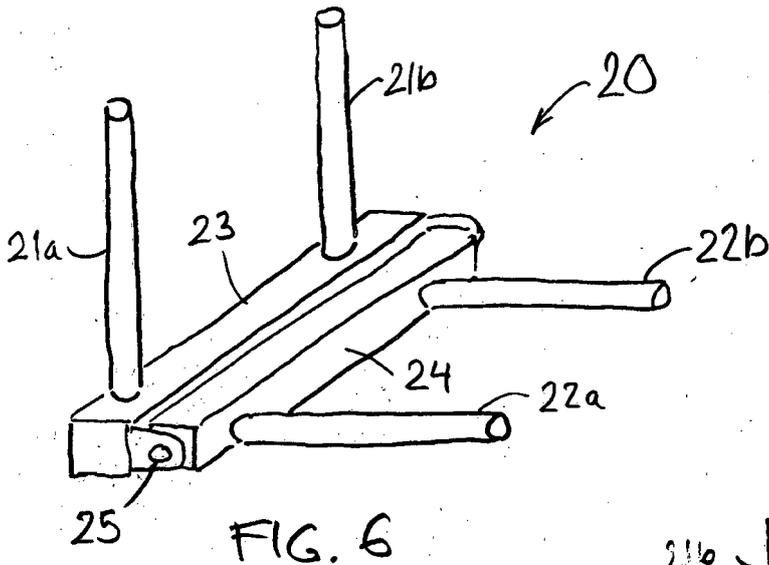


FIG. 6

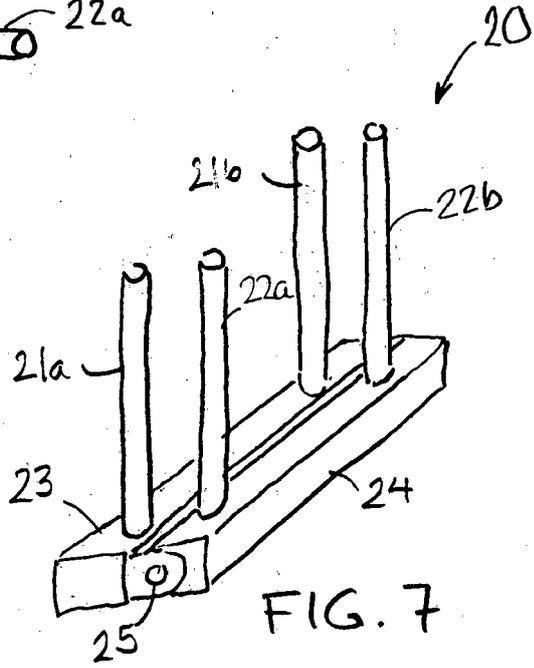


FIG. 7

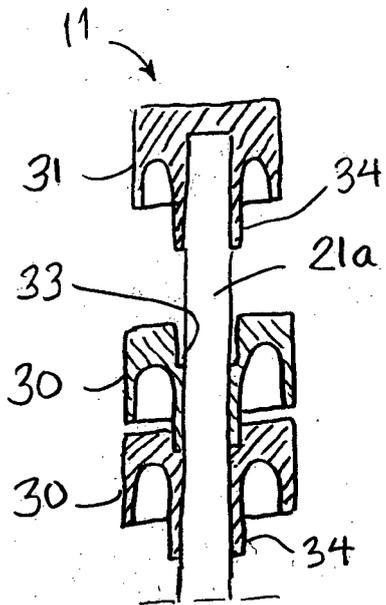


FIG. 8

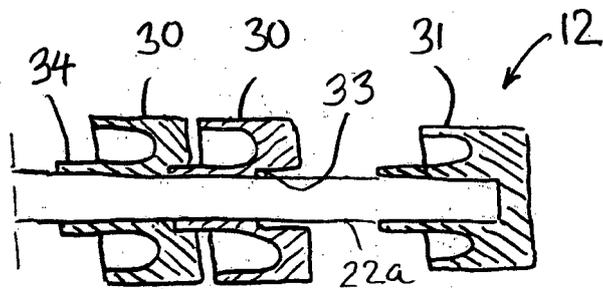
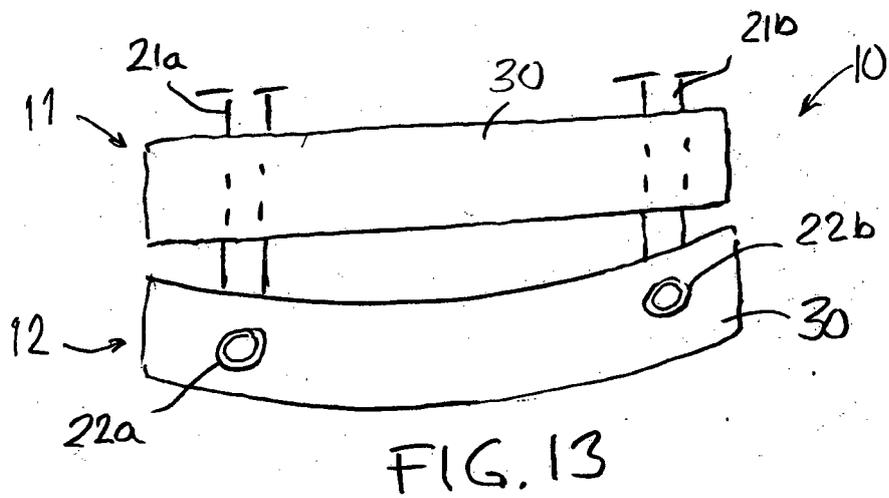
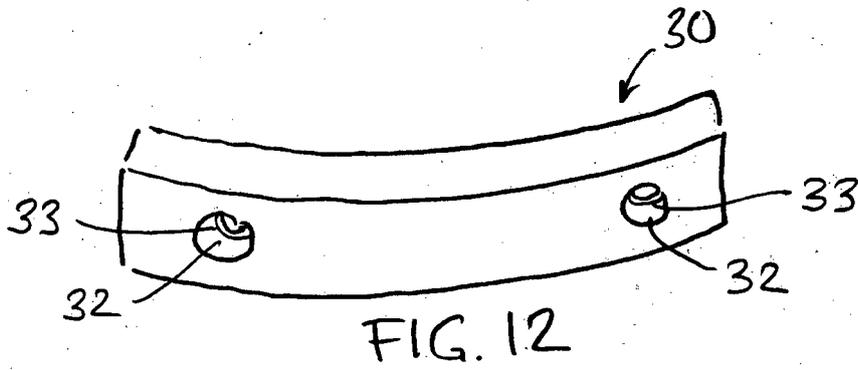
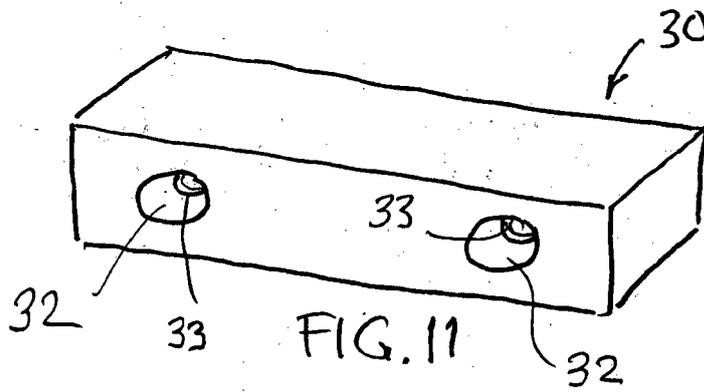
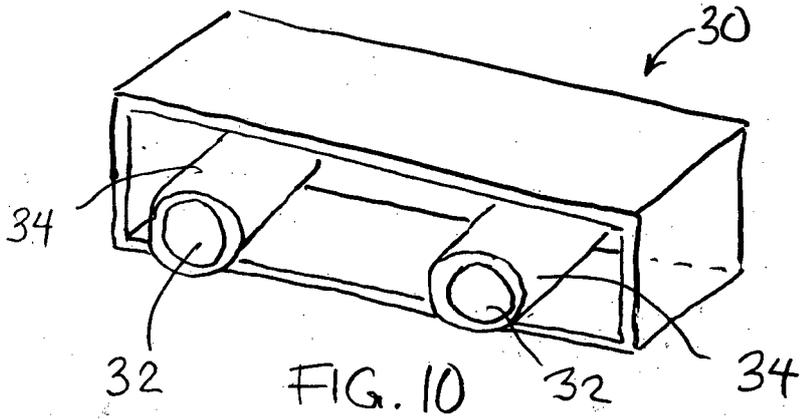


FIG. 9



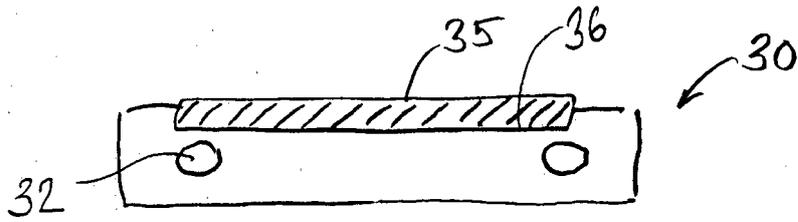


FIG. 14

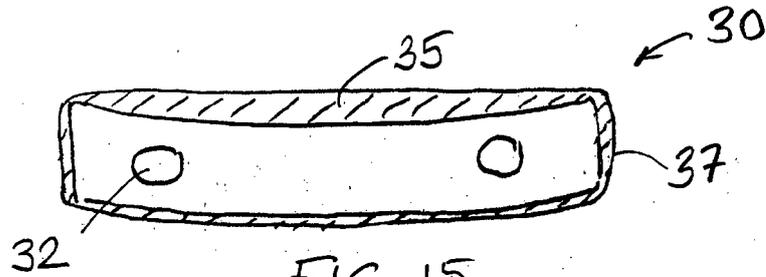


FIG. 15

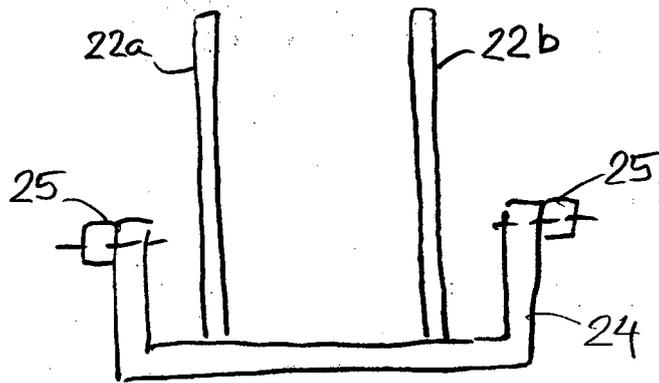


FIG. 16

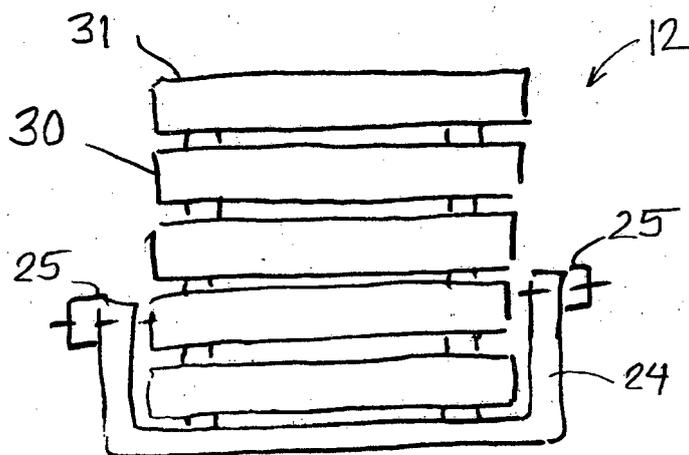


FIG. 17

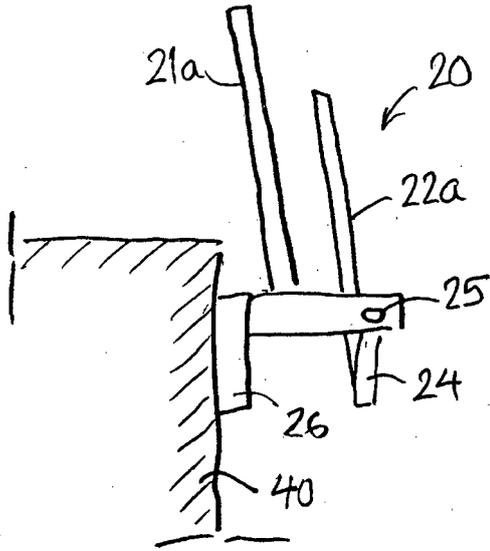


FIG. 18

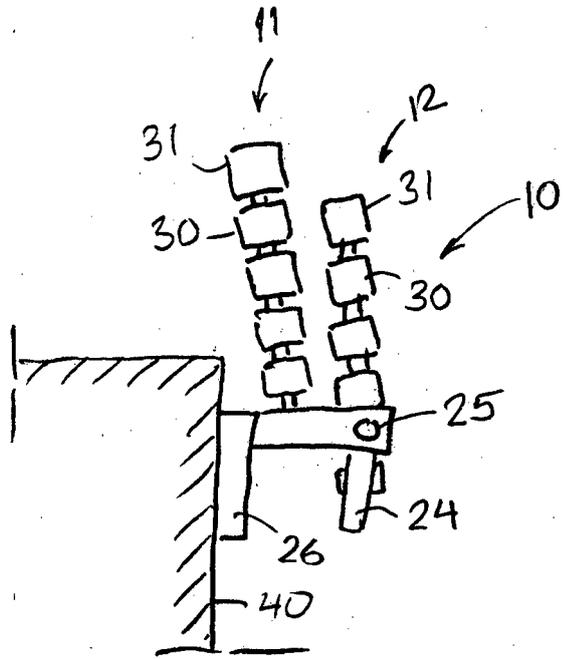


FIG. 19

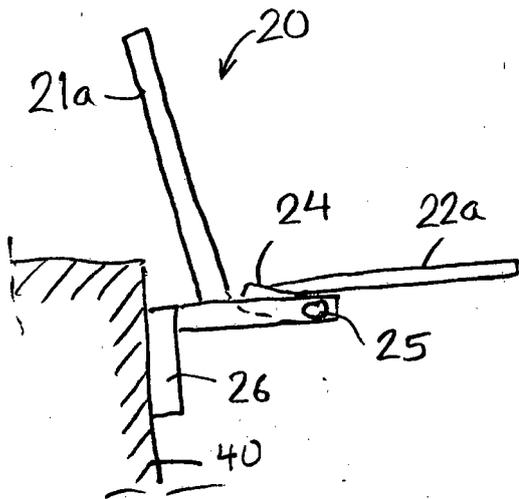


FIG. 20

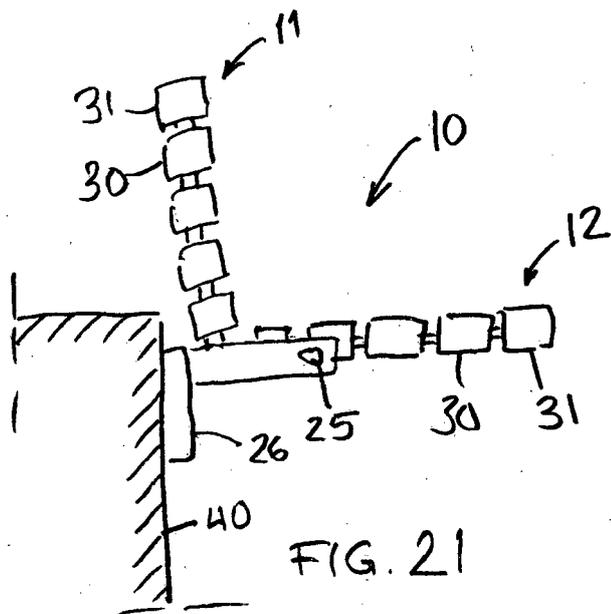


FIG. 21



EUROPEAN SEARCH REPORT

Application Number  
EP 16 39 6002

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			A47C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 May 2017	Examiner Kus, Slawomir
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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

EP 16 39 6002

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  
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19-05-2017

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