

(19)



(11)

**EP 4 494 521 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**22.01.2025 Bulletin 2025/04**

(51) International Patent Classification (IPC):  
**A47C 5/04 (2006.01) A47C 7/00 (2006.01)**

(21) Application number: **24188668.8**

(52) Cooperative Patent Classification (CPC):  
**A47C 5/04; A47C 7/002**

(22) Date of filing: **15.07.2024**

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA**  
Designated Validation States:  
**GE KH MA MD TN**

(71) Applicant: **CERANTOLA S.P.A.**  
**31037 Loria, Frazione Ramon (TV) (IT)**

(72) Inventor: **CERANTOLA, Roberto**  
**31011 Asolo (IT)**

(74) Representative: **Modiano, Micaela Nadia et al**  
**Modiano & Partners**  
**Via Meravigli, 16**  
**20123 Milano (IT)**

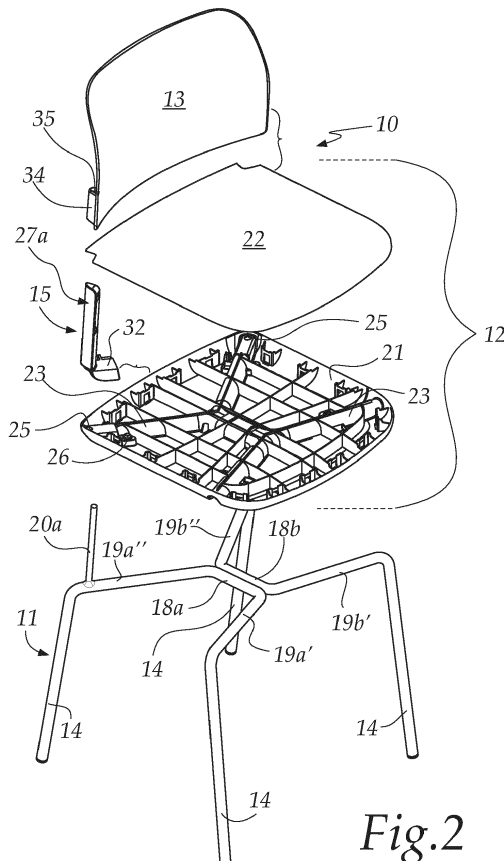
(30) Priority: **19.07.2023 IT 202300015105**

(54) **CHAIR**

(57) A chair (10), comprising:  
- a frame (11) for supporting a seat (12) and a backrest (13), the frame (11) being provided with legs (14) for resting on the ground,

- the seat (12),  
- the backrest (13).

At least the backrest (13) is fixed to the frame (11) by virtue of interlocking means (15).



*Fig.2*

**EP 4 494 521 A1**

## Description

[0001] The present invention relates to a chair.

[0002] Nowadays, a considerable quantity of types of chairs are widely available on the market.

[0003] These usually have a frame, provided with legs for resting on the ground, which supports a seat and a backrest and couples them together.

[0004] Normally, the backrest and the seat are joined to the frame using fixing means such as screws, bolts, nails, pegs, etc.

[0005] The sight of such fixing means leads to an unpleasant visual impact.

[0006] Furthermore, the need to fix the backrest and/or the seat to the frame using such fixing means entails a process of providing the chair that is long and inconvenient, and the necessity to use tools.

[0007] The aim of the present invention is to provide a chair which is capable of improving the known art in one or more of the above-mentioned aspects.

[0008] Within this aim, an object of the invention is to provide a chair in which there are no means present for fixing the seat or the backrest to the frame, such as screws and/or nails and/or pegs, or such fixing means are hidden from view.

[0009] Another object of the invention is to provide a chair that can be assembled more easily and rapidly with respect to similar, conventional chairs, limiting the use of tools compared to such conventional chairs.

[0010] A further object of the present invention is to overcome the drawbacks of the background art in a manner that is alternative to any existing solutions.

[0011] Another object of the invention is to provide a chair that is highly reliable, easy to implement, and at low cost.

[0012] This aim and these and other objects which will become more apparent hereinafter are achieved by a chair, which comprises:

- a frame for supporting a seat and a backrest, said frame being provided with legs for resting on the ground,
- said seat,
- said backrest,

said chair being characterized in that at least said backrest is fixed to said frame by virtue of interlocking means.

[0013] Further characteristics and advantages of the invention will become better apparent from the description of the chair according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

- Figure 1 is an overall perspective view of a chair, according to the invention;
- Figure 2 is an exploded view of the chair of Figure 1;
- Figures 3a and 3b are two different cross-sectional views of details of the chair of Figure 1;

- Figures 4 to 6 show some steps of assembling the chair of Figure 1;
- Figure 6a is an enlarged detailed view of the assembly step shown in Figure 6;
- Figures 7 and 8 show other steps of assembling the chair of Figure 1.

[0014] With reference to the figures, a chair according to the invention is generally designated by the reference number 10.

[0015] The chair 10 comprises:

- a frame 11 for supporting a seat 12 and a backrest 13, the frame 11 being provided with a plurality of legs 14 for resting on the ground,
- such seat 12,
- such backrest 13.

[0016] One of the peculiarities of the invention consists in that at least the backrest 13 is fixed to the frame 11 using interlocking means 15.

[0017] The expression "interlocking means" refers to means that make it possible to fix by simple interlocking/form-fit coupling, and without the use of elements such as nails, screws, pegs, etc. which require the use of one or more tools.

[0018] In embodiments not shown in the figures, both the backrest and the seat are fixed to the frame solely using interlocking means.

[0019] In particular, the frame 11 has two portions 16a, 16b, which are mirror-symmetrical with respect to the sagittal plane of the chair 10.

[0020] In the present description, the expression "sagittal plane" refers to the plane that runs in the fore-and-aft direction dividing a body into two parts: right and left.

[0021] Each one of the portions 16a, 16b of the frame comprises:

- a substantially C-shaped section 17a, 17b, which is substantially parallel to the seat 12 and has in turn:
- a core 18a, 18b, from which two wings 19a', 19a", 19b', 19b" extend,
- such two wings 19a', 19a", 19b', 19b",
- two legs 14, each one of which extends from a respective free end of a corresponding one of such wings 19a', 19a", 19b', 19b", such legs 14 extending in a direction that is substantially perpendicular to the plane of arrangement of the substantially C-shaped section 17a, 17b, below the seat 12,
- an appendage 20a, 20b, which extends proximate to the free end of a corresponding one of such wings 19a', 19a", 19b', 19b", proximate to/facing the backrest 13, the appendage 20a, 20b extending in a direction at right angles to the plane of arrangement of the substantially C-shaped section 17a, 17b and in a direction that is opposite to that of the legs 14.

[0022] In the present description, the terms "upper",

"lower", "above", "below", etc. refer to the configuration for use of the chair 10.

**[0023]** Advantageously, the portions 16a, 16b of the frame 11 are fixed to each other at the respective core 18a, 18b.

**[0024]** The frame 11 is preferably made of metallic material.

**[0025]** The seat 12 is composed of two shells:

- a first, lower shell 21, associated with the frame 11, at the substantially C-shaped sections 17a, 17b,
- a second, upper shell 22, which is complementary to the first lower shell 21 and defines the user's horizontal resting surface.

**[0026]** Advantageously, the first lower shell 21 has a substantially quadrangular profile with:

- contoured zones 23 adapted to provide insertion/interlocking seats for the substantially C-shaped sections 17a, 17b,
- stiffening ribs 24.

**[0027]** The first lower shell 21 has two first through holes 25, each one for the insertion of a respective appendage 20a, 20b at/proximate to the corners of the substantially quadrangular profile that are proximate to the backrest 13.

**[0028]** The first lower shell 21 is fixed to the frame 11 by inserting/interlocking the substantially C-shaped sections 17a, 17b in the respective contoured zones 23, and fixing the wings 19a', 19a", 19b', 19b" to the first shell 21 with respective collars, not shown in the figures, connected to the shell with respective screws, also not shown in the figures, screwed into corresponding second holes 26 in the first lower shell 21.

**[0029]** The interlocking means 15 comprise two association elements 27a, 27b, which are mirror-symmetrical with respect to the sagittal plane of symmetry of the chair 10.

**[0030]** Each one of such association elements 27a, 27b has an elongated body which is provided, along its axis of extension, with:

- a first section 28, which is tubular and is provided with a third through hole 29 with an axis of extension that is parallel to the axis of extension of the elongated body,
- a second section 30, provided with a lateral opening 31, in communication with the third through hole 29.

**[0031]** The association elements 27a, 27b comprise a coupling portion 32 for coupling to the first lower shell 21.

**[0032]** This coupling portion 32 extends from the free end of the first section 28 of the respective association element 27a, 27b, and lies on a plane that is substantially perpendicular to the axis of extension of the elongated body thereof.

**[0033]** The coupling portion 32 has a C-shaped profile adapted to interlock with a respective contoured zone 23, on the opposite side with respect to the side of insertion of the respective substantially C-shaped section 17a, 17b.

**[0034]** Furthermore, such coupling portion 32 has a fourth through hole 33 for the insertion of a respective screw, not shown in the figures, for fixing to the first lower shell 21.

**[0035]** The backrest 13 has two portions 34 for association with the frame 11 (of which only one is shown in the figures), each one of which is inserted in the opening 31 of a respective association element 27a, 27b and is substantially shaped complementarily to such opening 31.

**[0036]** The association portions 34 have a substantially vertical configuration for use and an axis of extension that is substantially parallel to the plane of arrangement of the backrest 13.

**[0037]** Advantageously, each association portion 34 has shapes and dimensions that are such as to produce an interlocking/form-fit coupling with the respective opening 31, into which it is inserted.

**[0038]** Each one of the association portions 34 has a fifth through hole 35, which is adapted to correspond to the third hole 29 of the first section 28 of the corresponding association element 27a, 27b, for the insertion of a respective appendage 20a, 20b of the frame 11.

**[0039]** The seat 12, the backrest 13 and the association elements 27a, 27b are made of plastic material.

**[0040]** Figures 4 to 8 show the steps of assembling the chair 10, according to the invention.

**[0041]** The assembly of the chair 10 according to the invention is as follows.

**[0042]** First of all the association elements 27a, 27b are installed on the first shell 21 of the seat 12, interlocking the coupling portion 32 with a respective contoured zone 23, so as to make the third holes 29 correspond to the respective first holes 25 (Figures 4 and 5).

**[0043]** Then the association elements 27a, 27b are fixed to the first lower shell 21 using fixing screws (not shown in the figures) inserted in the fourth holes 33.

**[0044]** Subsequently, the backrest 13 is connected to the association elements 27a, 27b, by inserting the association portions 34 into the respective openings 31, arranging the fifth holes 35 at the respective third holes 29 (Figures 6 and 6a).

**[0045]** At this point the whole is fixed to the frame 11 by inserting the appendages 20a, 20b thereof into the respective first holes 25, third holes 29 and fifth holes 35 (Figure 7).

**[0046]** In this manner, it is no longer possible to remove the backrest 13 from the association elements 27a, 27b, and therefore from the first lower shell 21, without removing the frame 11.

**[0047]** The frame 11 is then fixed to the first lower shell 21, optionally by means of collars for clamping the wings 19a', 19a", 19b', 19b" and screws inserted into the second holes 26 from the lower surface of the first lower shell 21, therefore hidden from view in the configuration for use

of the chair 10.

[0048] Finally, the second shell 22 of the seat 12 is fixed/interlocked to the first shell 21 (Figure 8).

[0049] In practice it has been found that the invention fully achieves the intended aim and objects by providing a chair in which there are no means present for fixing the seat or the backrest to the frame, such as screws and/or nails and/or pegs, or such fixing means are hidden from view.

[0050] According to the invention a chair has been devised that can be assembled more easily and rapidly with respect to similar, conventional chairs, limiting the use of tools compared to such conventional chairs.

[0051] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0052] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0053] The disclosures in Italian Patent Application No. 102023000015105 from which this application claims priority are incorporated herein by reference.

[0054] Where technical features mentioned in any claim are followed by reference signs, such reference signs have been inserted for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

### 1. A chair (10), comprising:

- a frame (11) for supporting a seat (12) and a backrest (13), said frame (11) being provided with legs (14) for resting on the ground,
- said seat (12),
- said backrest (13),

said chair (10) being **characterized in that** at least said backrest (13) is fixed to said frame (11) by virtue of interlocking means (15).

### 2. The chair (10) according to claim 1, **characterized in that** said frame (11) has two portions (16a, 16b) which are mirror-symmetrical with respect to the sagittal plane of said chair (10), each one of said portions (16a, 16b) of said frame (11) comprising:

- a substantially C-shaped section (17a, 17b), which is substantially parallel to said seat (12) and has in turn:
- a core (18a, 18b), from which two wings (19a',

19a", 19b', 19b") extend,

- two of said legs (14), each one of said legs (14) extending from a respective free end of a corresponding one of said wings (19a', 19a", 19b", 19b"), said legs (14) extending in a direction that is substantially perpendicular to the plane of arrangement of said substantially C-shaped section (17a, 17b), below said seat (12),
- an appendage (20a, 20b), which extends proximate to the free end of a corresponding one of said wings (19a', 19a", 19b', 19b"), proximate to/facing said backrest (13), said appendage (20a, 20b) extending in a direction at right angles to the plane of arrangement of said substantially C-shaped section (17a, 17b) and in a direction that is opposite to that of said legs (14).

### 3. The chair (10) according to one or more of the preceding claims, **characterized in that** said seat (12) is composed of two shells:

- a first, lower shell (21), associated with said frame (11), at each of said substantially C-shaped sections (17a, 17b),
- a second, upper shell (22), which is complementary to said first shell (21) and defines the user's horizontal resting surface.

### 4. The chair (10) according to one or more of the preceding claims, **characterized in that** said first lower shell (21) has a substantially quadrangular profile with:

- contoured zones (23) adapted to provide insertion/interlocking seats for each said substantially C-shaped section (17a, 17b),
- stiffening ribs (24),

said first lower shell (21) having two first through holes (25), each one for the insertion of said respective appendage (20a, 20b) at/proximate to the corners of said substantially quadrangular profile that are proximate to said backrest (13).

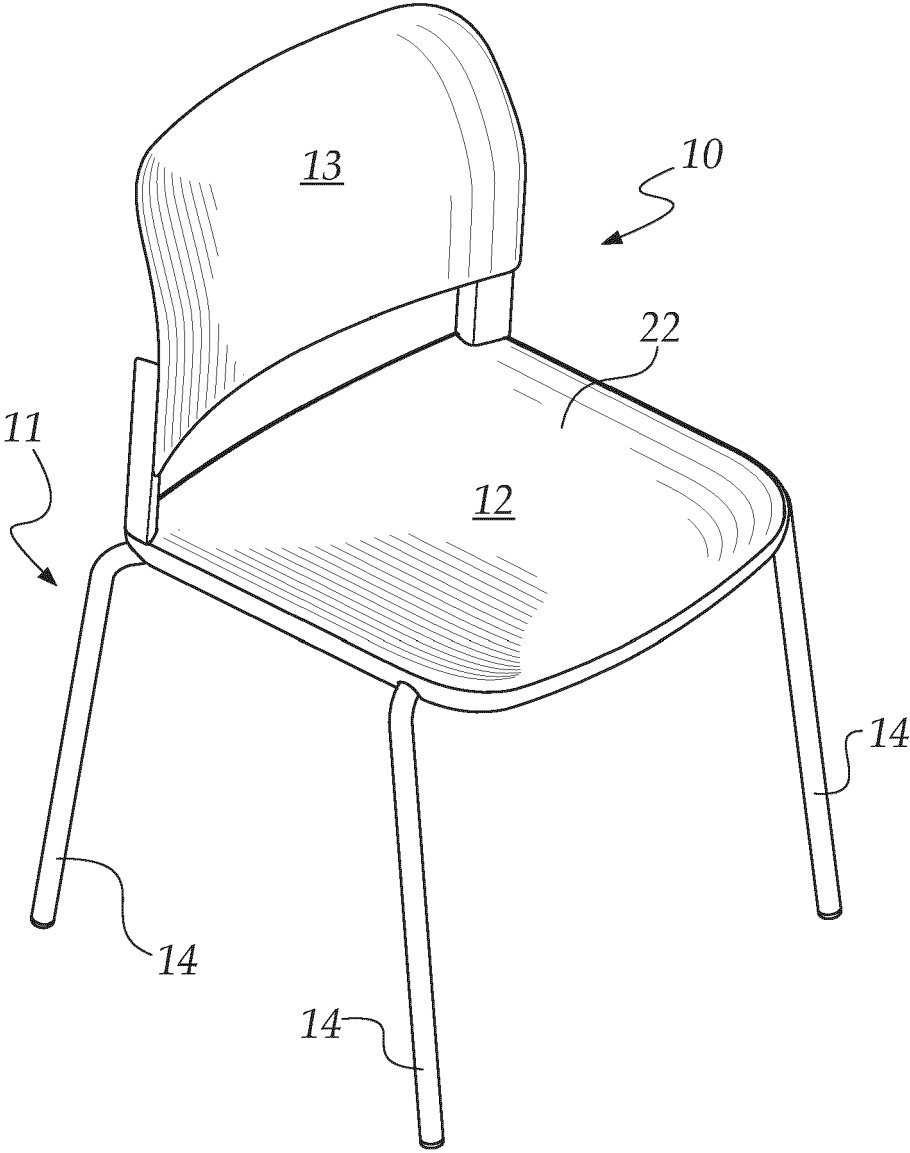
### 5. The chair (10) according to one or more of the preceding claims, **characterized in that** said interlocking means (15) comprise two association elements (27a, 27b), which are mirror-symmetrical with respect to the sagittal plane of symmetry of said chair (10), each one of said association elements (27a, 27b) having an elongated body which is provided, along its axis of extension, with:

- a first section (28), which is tubular and is provided with a third through hole (29) with an axis of extension that is parallel to the axis of extension of said elongated body,
- a second section (30), provided with a lateral

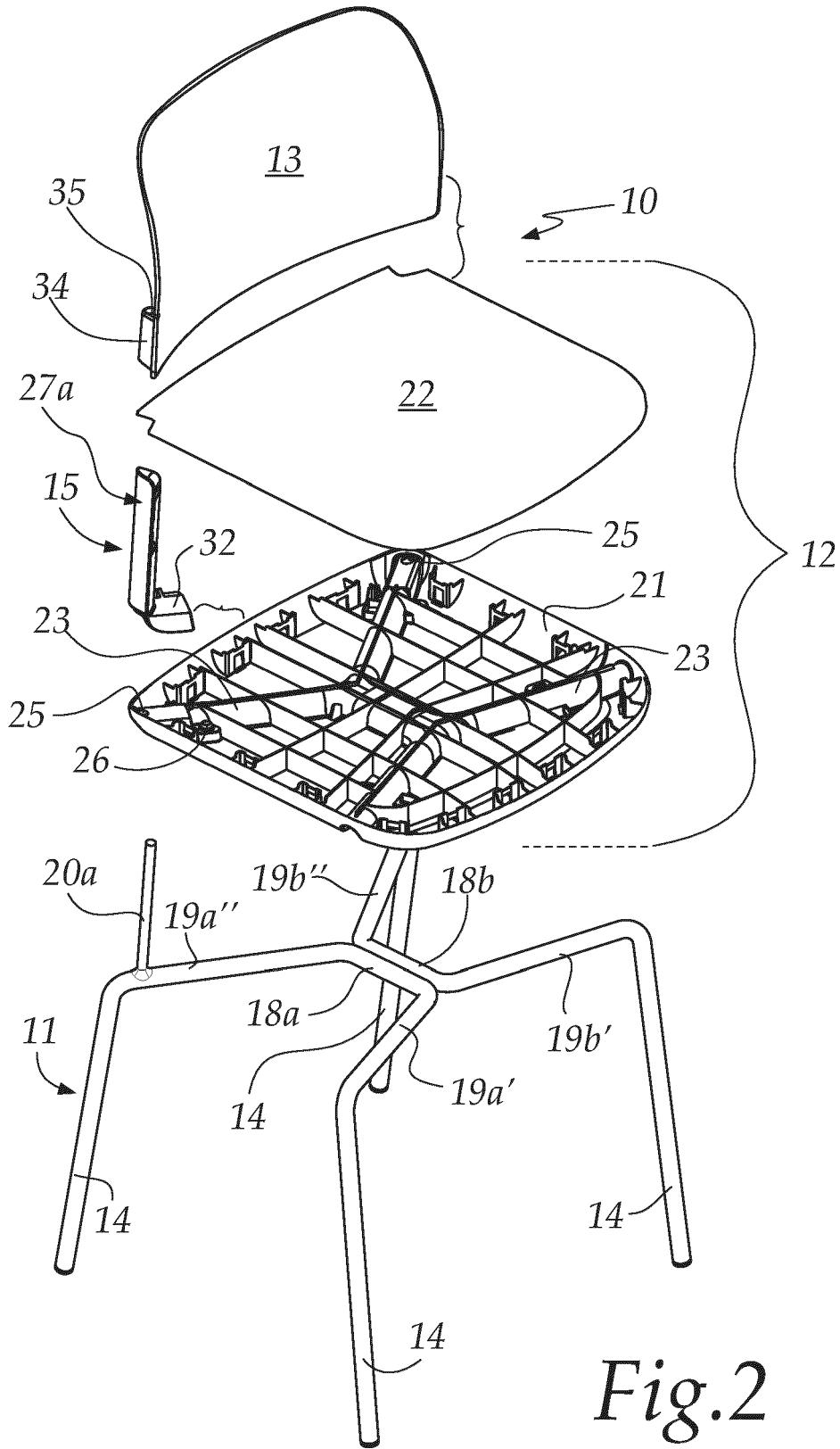
opening (31), in communication with said third through hole (29).

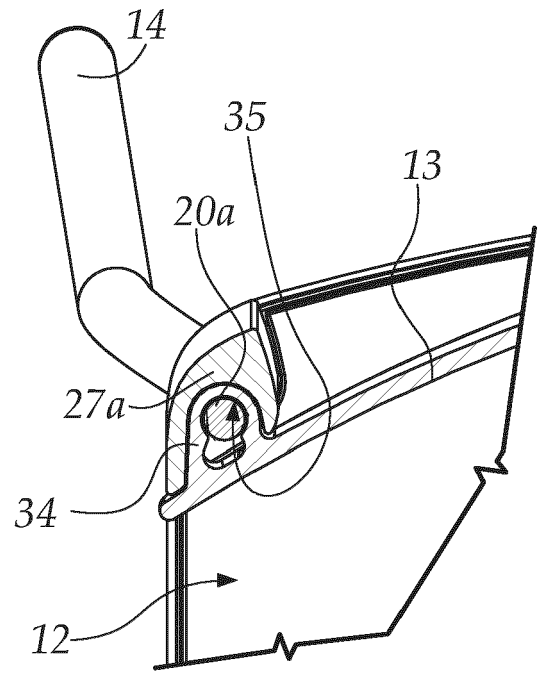
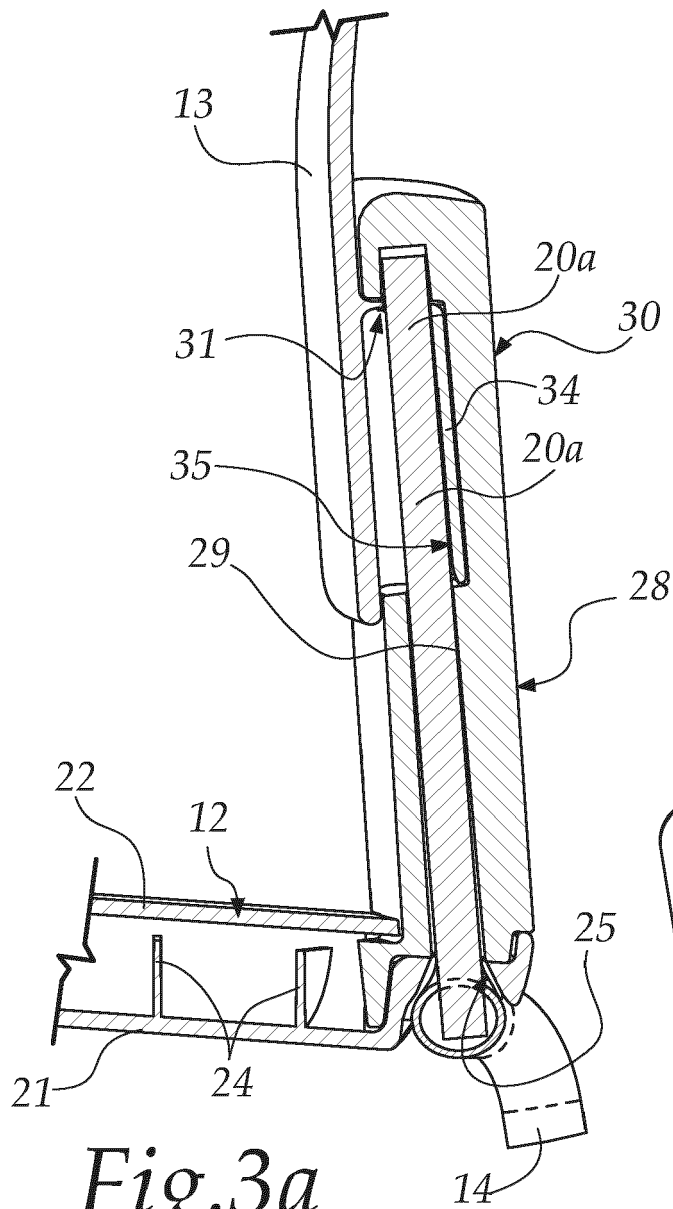
6. The chair (10) according to one or more of the preceding claims, **characterized in that** said association elements (27a, 27b) comprise a coupling portion (32) for coupling to said first lower shell (21), said coupling portion (32) extending from the free end of said first section (28) of the respective one of said association elements (27a, 27b), and lying on a plane that is substantially perpendicular to the axis of extension of said elongated body, said portion coupling (32) having a C-shaped profile adapted to interlock with a respective one of said contoured zones (23) on the opposite side with respect to the side of insertion of the respective said substantially C-shaped section (17a, 17b). 5  
10  
15
7. The chair (10) according to one or more of the preceding claims, **characterized in that** said coupling portion (32) has a fourth through hole (33), for inserting a respective screw for fixing to said first lower shell (21). 20
8. The chair (10) according to one or more of the preceding claims, **characterized in that** said backrest (13) has two portions (34) for association with said frame (11), each one of said portions (34) being inserted in said opening (31) of a respective one of said association elements (27a, 27b) and being substantially shaped complementarily to said opening (31). 25  
30
9. The chair (10) according to one or more of the preceding claims, **characterized in that** said portions (34) for association have a substantially vertical arrangement for use and an axis of extension that is substantially parallel to the plane of arrangement of said backrest (13), each one of said portions (34) for association having shapes and dimensions that are such as to produce an interlocking/shape mating with the respective said opening (31), in which it is inserted. 35  
40
10. The chair (10) according to one or more of the preceding claims, **characterized in that** each one of said portions (34) for association has a fifth through hole (35), which is adapted to correspond to said third hole (29) of said first section (28) of the corresponding one of said association elements (27a, 27b), for the insertion of a respective said appendage (20a, 20b) of said frame (11). 45  
50

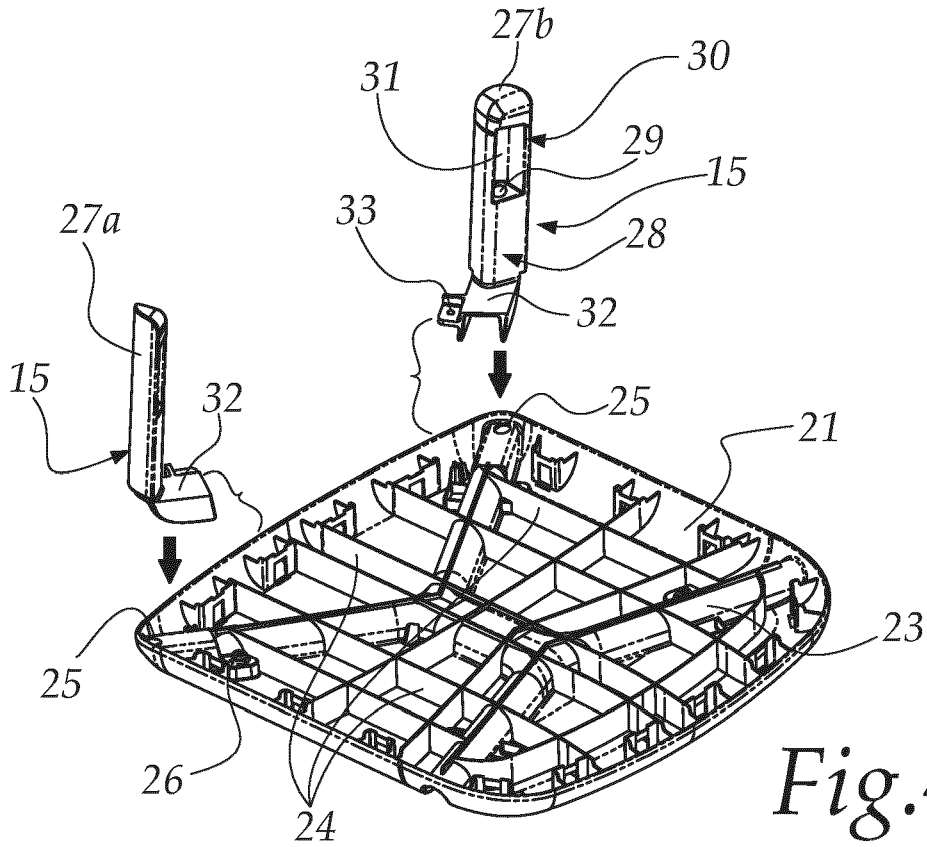
55



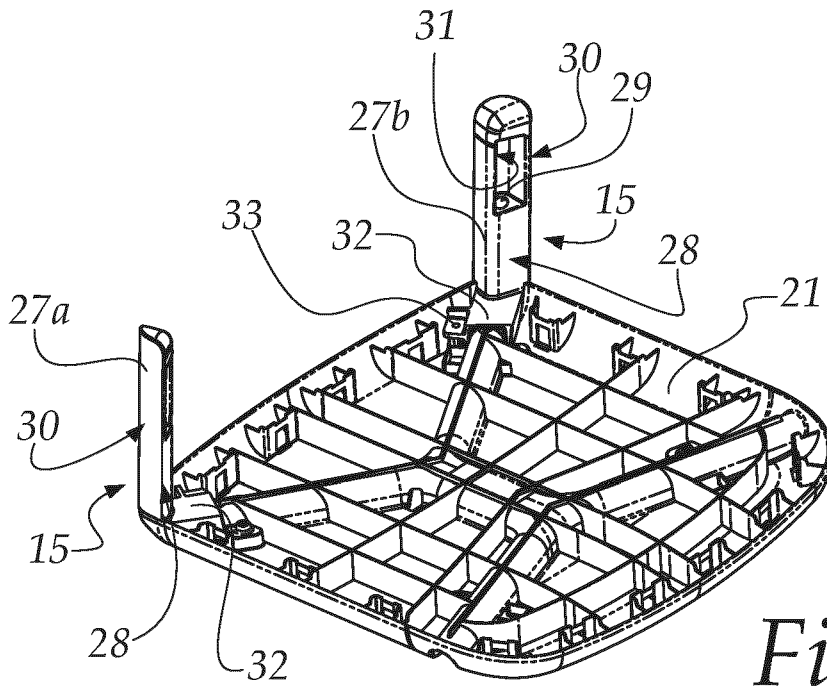
*Fig.1*







*Fig. 4*



*Fig. 5*

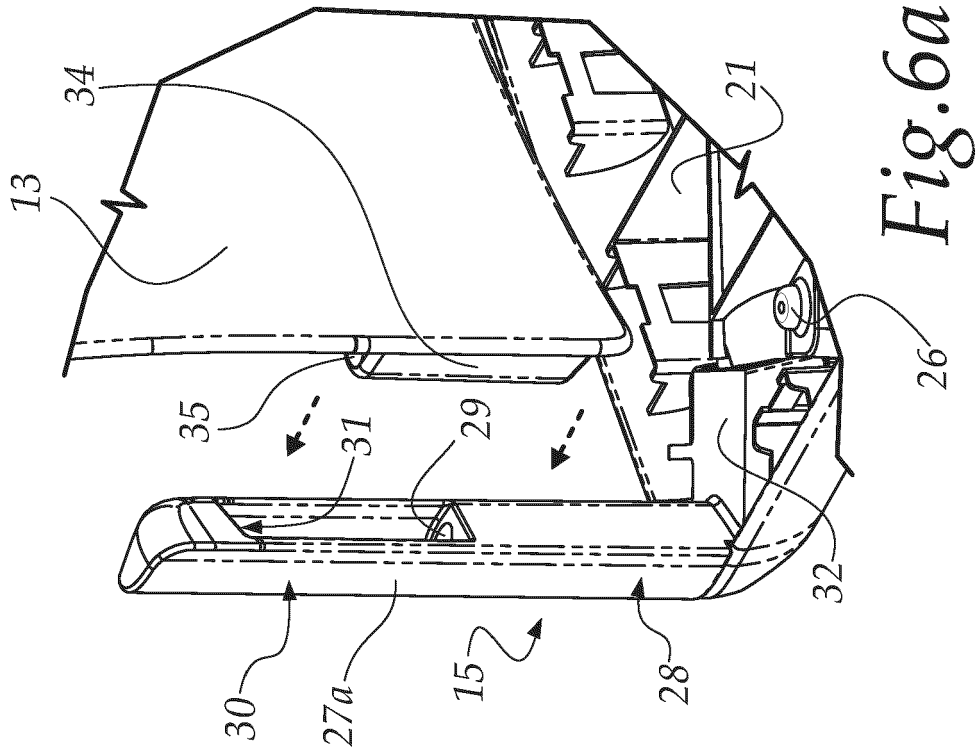


Fig. 6a

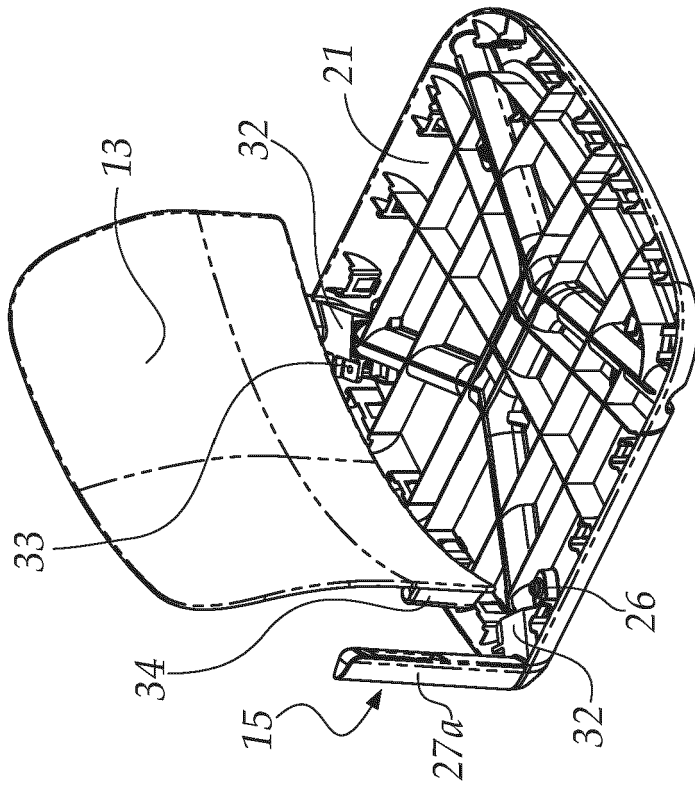
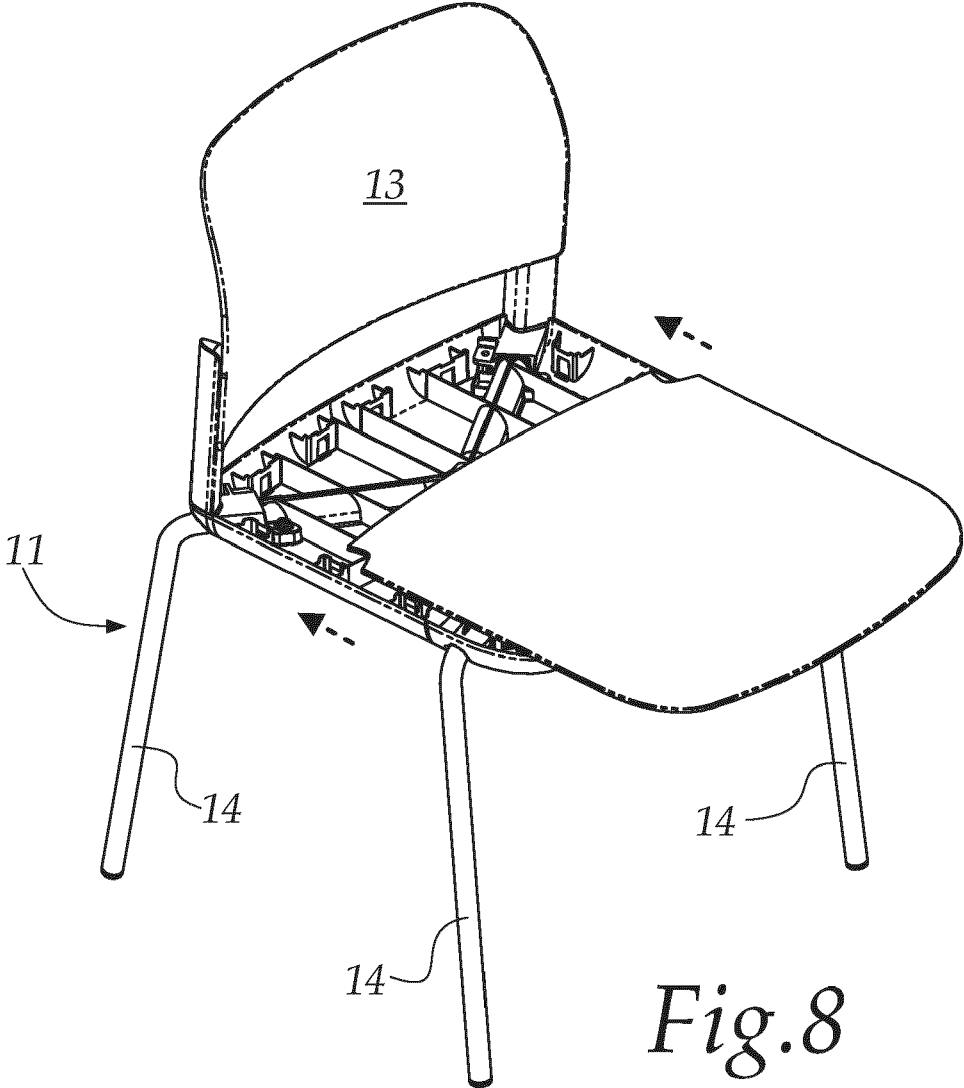


Fig. 6







EUROPEAN SEARCH REPORT

Application Number  
EP 24 18 8668

5

10

15

20

25

30

35

40

45

50

55

| DOCUMENTS CONSIDERED TO BE RELEVANT   |  |   |   |
|---|--|---|---|
| Category  | Citation of document with indication, where appropriate, of relevant passages  | Relevant to claim   | CLASSIFICATION OF THE APPLICATION (IPC) |
| X   | WO 2022/240616 A1 (STEELCASE INC [US])<br>17 November 2022 (2022-11-17)<br>* paragraph [0026] - paragraph [0102];<br>figures 1-18 *            | 1-3   | INV.<br>A47C5/04<br>A47C7/00            |
| X   | -----<br>US 2 539 919 A (MEEK JR CHARLES E ET AL)<br>30 January 1951 (1951-01-30)<br>* column 2, line 15 - column 4, line 17;<br>figures 1-5 * | 1,2<br>4-10   |   |
| A   | -----<br>GB 1 602 912 A (KERON LTD)<br>18 November 1981 (1981-11-18)<br>* page 1, line 90 - page 2, line 86;<br>figures 1-2 *                  | 1,2   |   |
| X   | -----  |   |   |
|   |  |   | TECHNICAL FIELDS SEARCHED (IPC)         |
|   |  |   | A47C                                    |
| The present search report has been drawn up for all claims  |  |   |   |
| Place of search   |  | Date of completion of the search  | Examiner                                |
| The Hague   |  | 13 November 2024  | Lehe, Jörn                              |
| CATEGORY OF CITED DOCUMENTS   |  |   |   |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |  | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |   |

1  
EPO FORM 1503 03.82 (P04C01)

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

EP 24 18 8668

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.

13 - 11 - 2024

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|--|------------------|-------------------------|------------------|
| WO 2022240616 A1                       | 17-11-2022       | CN 117615688 A          | 27-02-2024       |
|  |                  | EP 4337060 A1           | 20-03-2024       |
|  |                  | US 11510495 B1          | 29-11-2022       |
|  |                  | US 2023046483 A1        | 16-02-2023       |
|  |                  | WO 2022240616 A1        | 17-11-2022       |
| -----                                  |                  |                         |                  |
| US 2539919 A                           | 30-01-1951       | NONE                    |                  |
| -----                                  |                  |                         |                  |
| GB 1602912 A                           | 18-11-1981       | NONE                    |                  |
| -----                                  |                  |                         |                  |

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**

- IT 102023000015105 [0053]