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(54) **MODULAR TABLE**

(57) The present invention is in the field of modular tables which can assume more than one configuration according to the intended use, and in particular concerns to a modular table (10) which can assume two distinct configurations, square or octagonal, through the manip-

ulation of the parts that integrate it. In order to this change of configurations to be possible, the present invention consists of four lateral plates (12) of pentagonal geometry, a central square plate (30) and four legs (40).

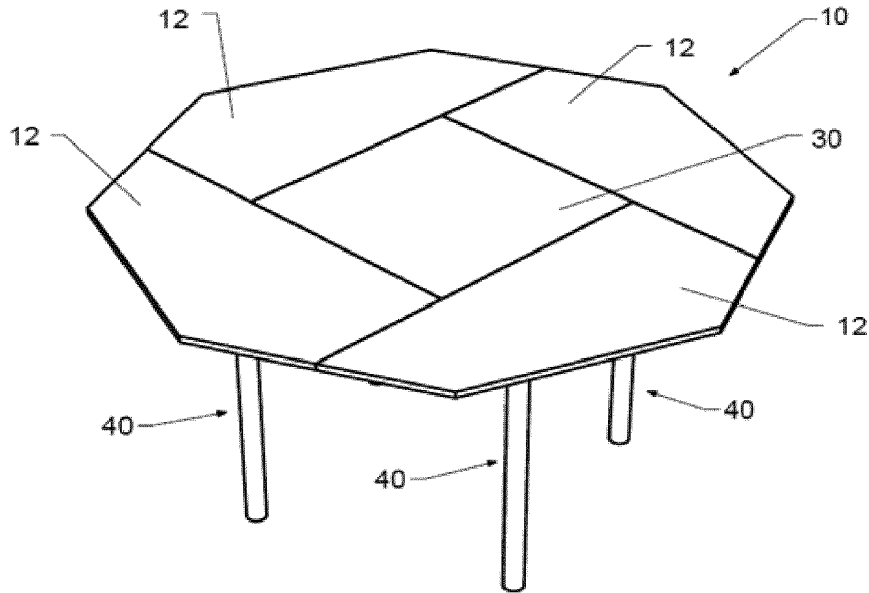


Fig. 2

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Description

FIELD OF THE INVENTION

5 [0001] The present invention is in the field of modular tables which can assume more than one configuration according to the intended use, and in particular concerns to a modular table which can assume two distinct configurations, square or octagonal, through the manipulation of the parts that integrate it.

BACKGROUND OF THE INVENTION

10 [0002] The present invention has its closest background in the following patent documents: US556566, which discloses a double table with the rotation point of the smaller area table on the larger area table, and US3964403, which discloses a table with dual function, for two or four players, or for dinner for four or six persons, wherein it alternates from circular to square geometry in order to achieve these functions, and it differs from the present invention both in terms of the
15 possible geometries and in the way it allows the transformation from one geometry to the other.

DESCRIPTION OF THE FIGURES

INDICATION OF REFERENCE NUMBERS:

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[0003]

- table (10);
- side plates (12);
- 25 • central edges (14a) and edges (14b) of the side plates (12);
- (14c) location of the rotation axis (E) of the side plate (12);
- central plate (30);
- support plate (35);
- legs (40);

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- A - inner angle of the side plate (12);
- B - angle that set the position of point (P);
- C - rotation angle of the side plate (12);
- E - rotation axis of the side plate (12);
- 35 P - location of table legs (40)

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F ig. 1 - table (10) with square configuration, wherein the side plates (12) having their edges adjacent to the sides of the central plate (30) and their right-angles corresponding to the corners of the table are visible. A portion of the support plate (35) and the legs (40) are also visible.

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F ig. 2 - table (10) with octagonal configuration, wherein the side plates (12) having the edges that form the right-angles corresponding to the corners of the central plate (30) and the legs (40) are visible.

F ig. 3 - representation of a portion of the table in the square configuration, during the withdrawal or vertical upward movement of one of the side plates (12) about the rotation axis (E).

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F ig. 4 - representation of a portion of the table during the changing to the octagonal configuration, when placing or moving downward vertically one of the side plates (12) about the rotation axis (E).

F ig. 5 - representation of one of the four lateral plates (12), where the pentagonal geometry is visible, and wherein two edges form an internal right-angle (90°) between them, and two of the three remaining edges form each one an angle of 135° with the central edge (14a). The two edges (14b) that form the angles of 135° with the central edge (14a) have the same length, and the central edge (14a) has the same length as the side of the center plate (30), which is the reason why this edge is called central edge (14a). The two edges forming an internal right-angle (90°) between them, that is, the two edges representing the two sides of a right triangle which has the smallest internal angle (A) and the line joining the two vertices of the edges (14b) form a right triangle, wherein the smallest angle of this triangle is defined by the internal angle (A).

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Fig. 6 - representation of the location (P) of the legs (40) along a circumference inscribed on the lower surface of the support plate (35) with radius (36a), and defined according to the angle (B) with respect to the perpendicular bisector of each edge of the central plate (30) .

5 DETAILED DESCRIPTION OF THE INVENTION

[0004] The present invention relates to a modular table comprising:

- four legs (40);
- 10 • a support plate (35) attached to the legs (40);
- a central plate (30), which has a square geometry with side equal to the central edge (14a) of the side plate (12), and is attached to the top surface of the support plate (35), wherein the centers of both plates (30) and (35) are overlapped;
- 15 • four side plates (12), which are movable and follow a specific geometry, which is detailed below since it is essential in order the table (10) have the capability of being transformed either:
 - in a square with side of length (L); or
 - in a regular octagon inscribed in a circumference of diameter (D), wherein all the sides have the same length as the central edge (14a).

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[0005] Each of the four side plates (12) has a pentagonal geometry, wherein two edges form an internal right-angle (90°) between them, and two of the three remaining edges form each one an internal angle of 135° with the central edge (14a), as shown in Fig. 5. As these geometric characteristics are not enough, it is necessary that the two edges (14b) that form the angles of 135° with the central edge (14a) have the same length, and the central edge (14a) has the same

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length as the side of the central plate (30), which is the reason why this edge is called central edge (14a) .

[0006] It should be also noted that the length of the central edge (14a), in addition of being equal to the length of the side of the central plate (30), is twice the length of the edges (14b). In this way, and as will be described below, a regular octagonal table is formed, with equal sides of the same length as the central edge (14a).

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[0007] Thus, it is clear that for the present invention to assume the square configuration with side (L), it is necessary to place the central plate (30) with its center overlapping the center of the support plate (35) on its top surface, and each of the four side plates (12) with-edges of the same length as the side of the central plate (30), i.e. the central edges (14a), placed adjacent to the sides of the central plate (30), in order to form a square. In this way the right-angles of the side plates (12) form the four corners of the table (10) in a square shape.

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[0008] In order the table (10) has an octagonal configuration, the side plates (12) are removed and relocated, but this time with the right-angles of side plates (12) coinciding with the right-angles of the central plate (30) .

[0009] The attachment of the side plates (12) to the central plate (30) may be accomplished by any suitable joint for this purpose, such as for example tongued and grooved joint between edges, wherein fixing of the central plate (30) and support plate (35) may be carried out by means of pins which allow their withdrawal, fixation and rotation.

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[0010] In this embodiment, the table can be completely disassembled into pieces and easily transported, and can be assembled as many times as the user wishes and in the configuration that is best suited, whether to four users or eight users.

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[0011] In a preferred embodiment, the changing of table (10) configuration from square to octagonal may be done without the need to relocate manually all the four side plates (12) in a new position, but using instead rotational axes placed on the support plate (35) where the side plates (12) are fixed, allowing them to be slightly raised and rotated about the rotation axis (E), till reaching the positions that correspond to the square or octagonal configuration of the table (10).

[0012] For this preferred embodiment, it is necessary to define the diameter (D) of a circumference which will circumscribe the octagon, and thus the length of the central edge (14a) must be calculated as a function of the diameter (D), so that the rotation axis (E) of the side plates can be located in specific positions, as well as those of the support plate (35).

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[0013] Thus, the lengths of the central edges (14a) are calculated using the expression (1):

$$(1) \quad (14a) = \frac{\sqrt{2 - \sqrt{2}}}{2} \cdot (D)$$

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[0014] We know that the edges (14b) are half the length of the central edges (14a).

[0015] The two remaining edges, that is, the two edges representing the two sides of a right triangle and forming a

right triangle with the smallest internal angle (A) defined by the expression (2):

$$(2) \quad (A) = \arctg \left(\frac{-1 + \sqrt{2 + 2 \cdot \sqrt{2}}}{1 + \sqrt{2 + 2 \cdot \sqrt{2}}} \right)$$

[0016] The location of the four rotation axis (E) of the side plates (12) is determined under the line joining the vertices of the two edges (14b) of the side plates (12), and is measured from the smaller angle vertex of the side plates (12). Thus, the distance (14c) between the smaller inner angle vertex and the location of the rotation axis (E) is calculated using the expression (3):

$$(3) \quad (14c) = \frac{\sqrt{4 + 2 \cdot \sqrt{2}}}{8} \cdot \left(1 + \operatorname{tg} \left(\frac{(A)}{2} \right) \right) \cdot (D).$$

[0017] Starting from the square configuration, each one of the side plates (12) performs a vertical upward movement along the rotation axis (E) followed by a rotation with an angle (C), where (C) is calculated using the expression (4):

$$(4) \quad (C) = 180^\circ - (A).$$

[0018] To finalize, a downward vertical movement is performed in order the side plate (12) lays again on the support plate (35), and the same is repeated to the next side plate (12) until these three movements are performed with the four side plates (12), ending with an octagonal configuration for the table (10).

[0019] It should be noted that the square shaped table (10) has a side with a length (L), wherein (L) is calculated using the expression (5):

$$(5) \quad (L) = \frac{\sqrt{2 \cdot \sqrt{2}}}{2} \cdot (D)$$

[0020] Preferably, and in both embodiments with or without rotational axes (E), the location (P) of the legs (40), in order they are suitable and comfortable in both configurations, is set at the end of a radius of a circumference inscribed on the lower surface of the support plate (35), with the center coincident therewith and radius (36a), wherein this radius can be calculated using the expression (6):

$$(6) \quad (36a) = \frac{\sqrt{2 \cdot \sqrt{2}}}{4 \cdot \sqrt{2}} \cdot (D)$$

[0021] Regarding the locations (P) of the four legs (40) along the circumference with radius (36a), and so that the comfort of the user is increased, these locations (P) are defined according to the angle (B) measured with respect to the perpendicular bisector of each edge of the central plate (30), and wherein the angle (B) is calculated using the expression (7):

$$(7) \quad (B) = 45^\circ - (A).$$

[0022] As will be apparent to one skilled in the art, the present invention should not be limited to the embodiments described herein, and a number of changes are possible which remain within the scope of the present invention.

[0023] Of course, the preferred embodiments shown above are combinable, in the different possible configurations, avoiding repeating all such combinations herein.

Claims

1. Modular square table having a side with length (L), or regular octagon table inscribed on a circumference of diameter (D), **characterized in that:**

a) the side with length (L) is calculated from the expression:

$$(L) = \frac{\sqrt{2 \cdot \sqrt{2}}}{2} \cdot (D);$$

b) said table comprises:

- a support plate (35) attachable to four legs (40) and a square central plate (30) attachable to the top surface of the support plate (35), wherein the centers of both plates (30) and (35) are overlapped;
- four pentagonal side plates (12), which have two edges forming an internal right-angle (90°) between them, two edges (14b) with equal length forming two internal angles of 135° with a central edge (14a), wherein this central edge (14a) has the same length as each side of the center plate (30) and is equal to twice the length of the edges (14b); and
- each one of the four side plates (12) placeable with the central edges (14a) adjacent to the sides of the central plate (30), with the right-angles of the side plates (12) forming the four corners of the table (10) in a square configuration; or
- each one of the four side plates (12) placeable so that their right-angles are coincident with the right-angles of the central plate (30), forming a regular octagon having all its sides with length equal to that of the central edge (14a).

2. Table according to claim 1, wherein the side plates (12) are movable.

3. Table according to the preceding claims, wherein the length of the central edge (14a) is equal to:

$$(14a) = \frac{\sqrt{2-\sqrt{2}}}{2} \cdot (D).$$

5. Table according to the preceding claims, wherein the two edges represent the two sides of a right triangle having the smallest internal angle (A) defined by the expression:

$$(A) = \arctg \left(\frac{-1 + \sqrt{2 + 2 \cdot \sqrt{2}}}{1 + \sqrt{2 + 2 \cdot \sqrt{2}}} \right)$$

6. Table according to the preceding claims, wherein the lateral plates (12) are fixed to the central plate (30) by means of a tongued and grooved joint between edges, and the attachment of the central plate (30) and support plate (35) is carried out by means of pins.

7. Table according to the preceding claims, wherein it comprises:

a) four rotation axis (E) placed on the support plate (35) and located under the line joining the vertices of the

two edges (14b) at a distance (14c) equal to $\frac{\sqrt{4+2\sqrt{2}}}{8} \cdot \left(1 + \operatorname{tg} \left(\frac{(A)}{2} \right) \right) \cdot (D)$, measured from the smallest angle vertex of the side plates (12); and

b) the side plates (12) are movable vertically along the rotation axis (E) and rotate with an angle (C) equal to $180^\circ - (A)$, forming a regular octagon having all its sides with a length equal to that of the central edge (14a), or a square with side (L).

8. Table according to the preceding claims, wherein the legs (40) have a location (P) at the end of a radius of a

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circumference inscribed on the lower surface of the support plate (35), with the center coinciding therewith and

radius (36a), where $(36a) = \frac{\sqrt{2} \cdot \sqrt{2}}{4 \cdot \sqrt{2}} \cdot (D)$, and according to the angle (B) measured with respect to the perpendicular bisector of each edge of the central plate (30), where the angle (B) = 45° - (A).

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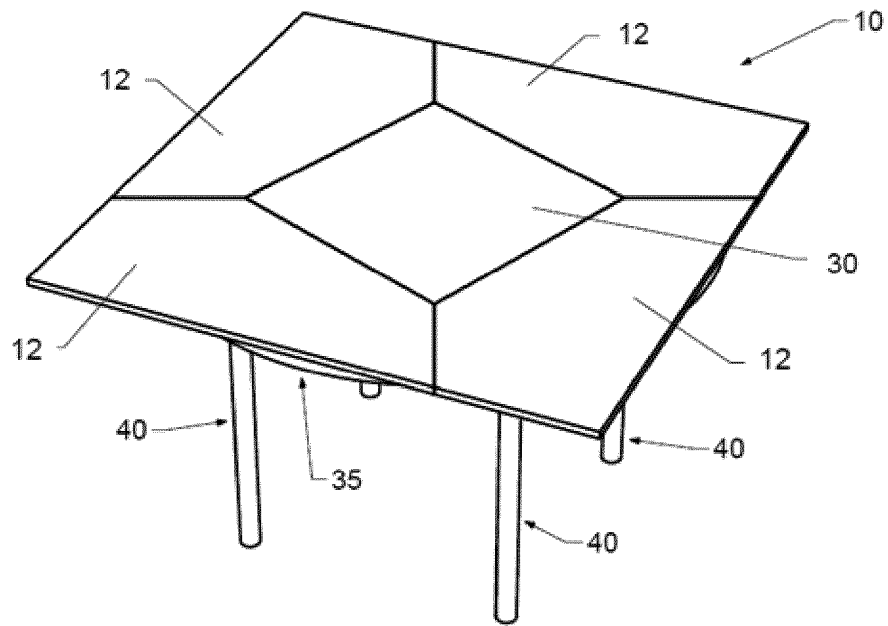


Fig. 1

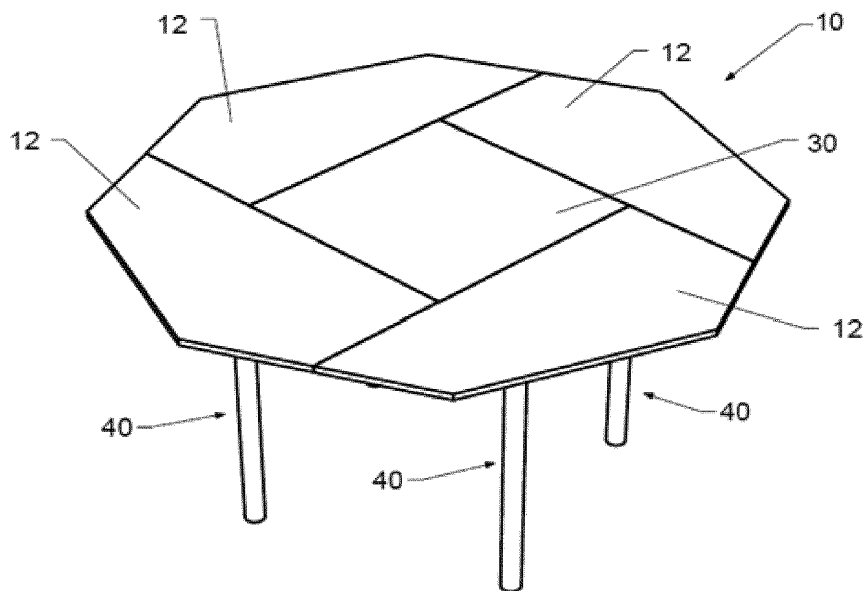


Fig. 2

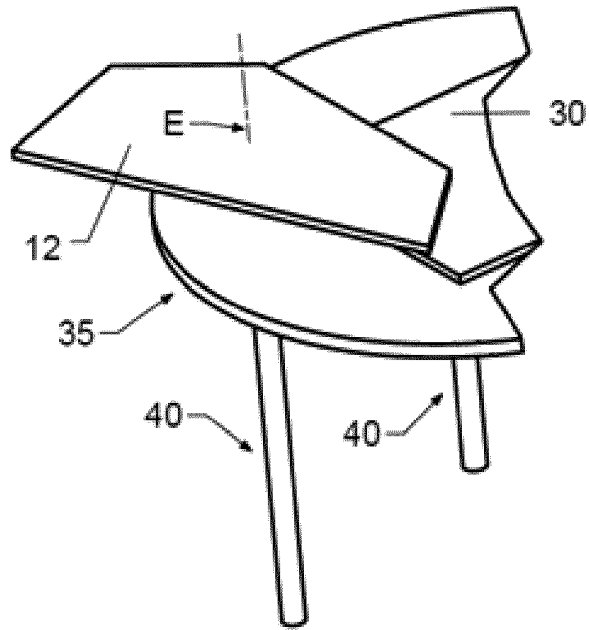


Fig. 3

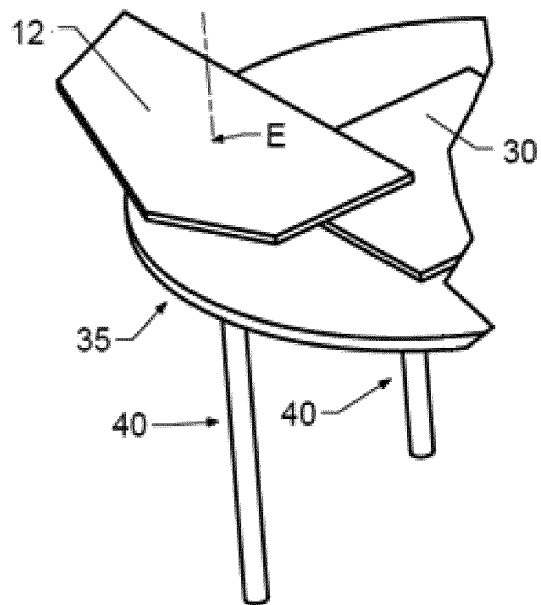


Fig. 4

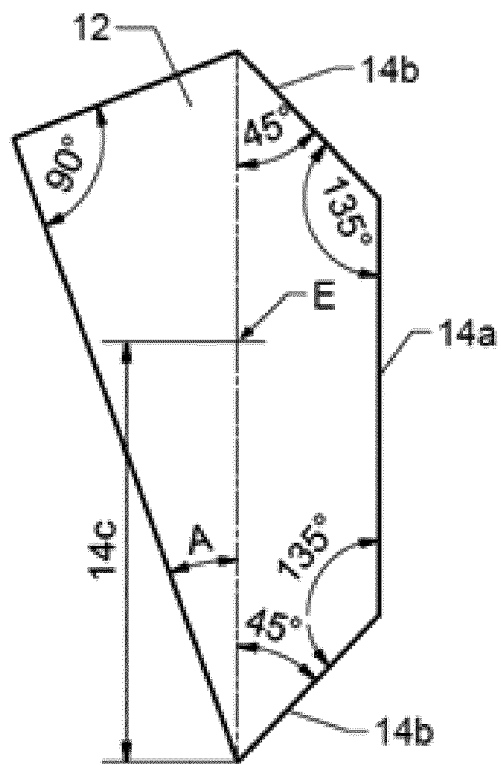


Fig. 5

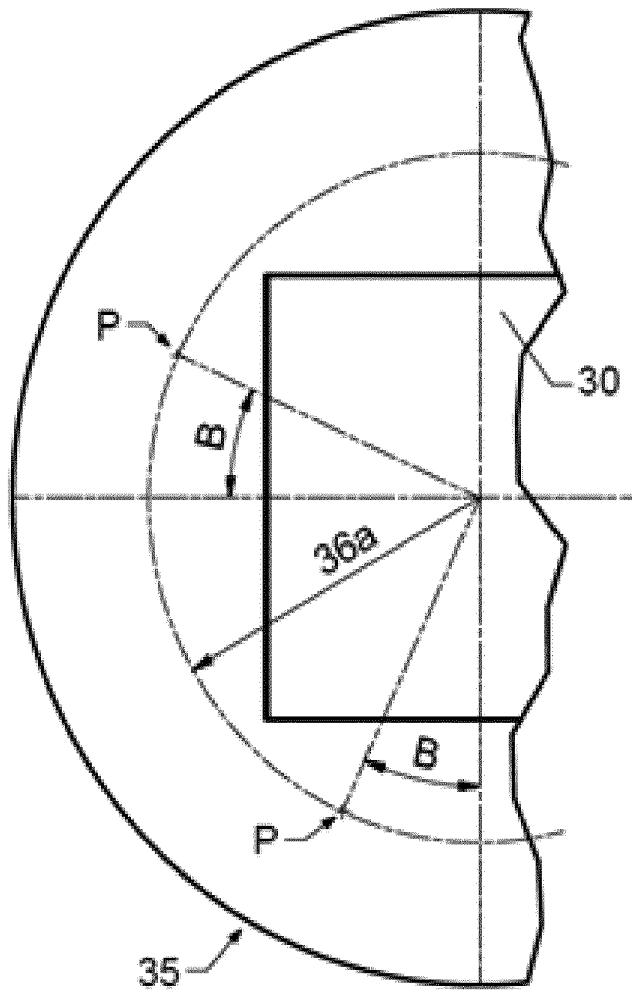


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 18 18 6164

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			A47B
1 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 January 2019	Examiner Linden, Stefan
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
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