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(54) **STUFFED CHAIR WITH ONE OR MORE SEATS, IN PARTICULAR ARMCHAIR OR COUCH**

(57) A mobile part (7) of a stuffed chair with one or more seats, in particular armchair or couch, is moved by an actuating device (10), which is selectively controlled by a control device (11), which is mounted between a stuffing (5) and a cover (6) for the stuffing (5) itself, and has a printed circuit (15) integrating at least one proximity actuating element (19).

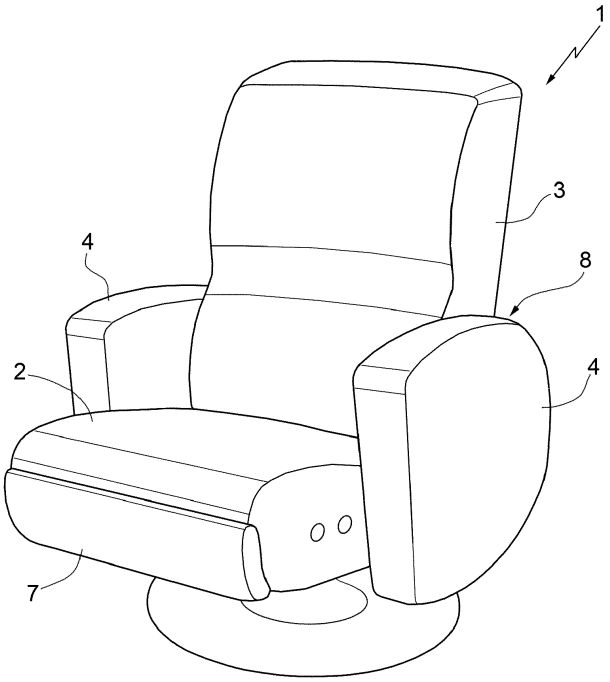

FIG.1

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Description

[0001] The invention relates to a stuffed chair with one or more seats, in particular an armchair or a couch.

[0002] In the interior design field, stuffed chairs are known, which comprise a seat for one or more people; a backrest; a fixed part; and at least one mobile part (e.g. a footrest, a headrest, and/or a massaging device), which is configured to move relative to the fixed part due to the action of an actuating system.

[0003] Generally speaking, the actuating system comprises an actuating device (for example an actuator cylinder or an electric motor) for the mobile part; and a control device to selectively control the operation of the actuating system itself.

[0004] The control device usually comprises a containing box, which is mounted inside a stuffing of the chair; a first capacitive proximity sensor to control the movement of the mobile part from a rest position to an operating position; and a second capacitive proximity sensor to control the movement of the mobile part from its operating position to its rest position.

[0005] Each capacitive proximity sensor comprises two armatures, which are housed inside the containing casing; one of them is connected, by means of a connection cable provided with a plug, to a sensitive terminal fitted on the outside of a cover of the stuffing of the chair, so as to allow the user to activate the capacitive proximity sensor.

[0006] The control device and the actuating device are connected to one another by means of an electric cable.

[0007] In use, the change in capacitance of each capacity proximity sensor, which is generated by the proximity of the user to the relative sensitive terminal, is transformed by the control device into an electric signal controlling the operation of the actuating device.

[0008] The connection cables used to connect the sensitive terminals and the relative armatures to one another normally are of two types.

[0009] According to a first type, the connection cables are unipolar, which means that they are relatively cheap, but they are also sensitive both to electrostatic charges normally present in the textiles of chairs and couches and to the magnetic fields normally present in the room and generated by radio links, mobile phones and/or wi-fi as well as bluetooth devices. As a consequence, the sensitivity to the aforesaid interferences can cause operating faults to arise in the actuating device and/or the actuating system to break.

[0010] According to the other one of the two types, the connection cables are shielded cables, which are not affected by the drawbacks that are typical for unipolar cables, but are relatively expensive and have a parasitic capacitance that is proportional to their length. As a consequence, since the change in capacitance of the capacitive proximity sensors detected by the control device is influenced by the length of the connection cables, the threshold values of the control device must be adjusted each time based on the length of the shielded connection cables.

[0011] The object of the invention is to provide a stuffed chair with one or more seats, in particular an armchair or a couch, which is designed to eliminate the aforementioned drawbacks in a straightforward, relatively low-cost manner.

[0012] The invention provides a stuffed chair with one or more seats, in particular an armchair or a couch, according to the appended claims.

[0013] The invention will now be described with reference to the accompanying drawings, which show a non-limiting embodiment thereof, wherein:

- figure 1 is a schematic perspective view of a preferred embodiment of the stuffed chair according to the invention;
- figure 2 is a schematic perspective view of a first detail of the stuffed chair of figure 1;
- figure 3 is a schematic exploded view of a second detail of the stuffed chair of figure 1;
- figure 4 is a schematic perspective view of a detail of figure 3; and
- figure 5 is a schematic plan view of a detail of figure 4.

[0014] With reference to figures 1 and 3, number 1 indicates, as a whole, a stuffed armchair having a seat 2, a backrest 3, and a pair of lateral armrests 4.

[0015] According to a variant that is not shown herein, the stuffed armchair 1 can be removed and replaced with a stuffed couch with multiple seats.

[0016] The seat 2 comprises a stuffing 5 and a cover 6 for the stuffing 5 itself, the cover 6 being made of a textile preferably comprising fabric, cloth, leather or artificial leather.

[0017] Obviously, further parts of the stuffed chair 1 also comprises a stuffing and a cover for the stuffing.

[0018] The stuffed chair 1 comprises, especially, a front footrest 7, which is mobile relative to a fixed part 8 of the stuffed chair 1 between a lowered rest position (figure 1) and a raised operating position (not shown).

[0019] Obviously, the stuffed chair 1 can comprise further mobile parts, such as, for example, a headrest and/or a massaging device.

[0020] According to figures 2 and 3, the footrest 7 is moved between its lowered rest position and its raised operating position by an actuating system 9 comprising an actuating device, in particular an actuator cylinder 10, which comprises an electric motor 10a and one or more relays 10b to control the motor 10a, and a control device 11 to selectively control the operation of the actuator cylinder 10.

[0021] The actuator cylinder 10 is connected to the fixed part 8 and has an output rod 12, which is connected to the footrest 7.

[0022] The control device 11 comprises a containing shell 13 with a flat shape, which is mounted between the stuffing 5 and the cover 6, is made of an electrically in-

sulating plastic material, and comprises two plates 14 coupled to one another.

[0023] With reference to figures 4 and 5, the shell 13 has an elongated rectangular shape with two semicircular ends and houses, on the inside, a printed circuit 15, which is mounted between the two plates 14 and substantially has the same shape as the shell 13.

[0024] The printed circuit 15 is provided, in the area of a central portion of its, with a plurality of electronic components 16, is connected to the actuator cylinder 10, and in particular to the relay 10b, by means of an electric cable 17, and has a connector 18 for the programming of the control device 11.

[0025] The printed circuit 15 carries, integrated in it, two capacitive proximity sensors 19, each of which is obtained in the area of one of the semicircular ends of the printed circuit 15 and comprises two metal armatures 20, which are concentric to one another and obtained on the printed circuit 15 itself.

[0026] The electronic components 16 of the printed circuit 15 comprise a microcontroller 16a, which is designed to read electric signals provided by the sensors 19 and generated by changes in the capacitance of the armatures 20 and to transform the signals provided by the sensors 19 into corresponding electric signals controlling the relays 10b, namely signals that are robust to electrostatic and electromagnetic interferences. In particular, the microcontroller 16a is designed to detect possible wrong signals provided by the sensors 19, i.e. signals that cannot be associated with the proximity of the user's body, so as to avoid giving false orders to the relays 10b. The connector 18 allows the microcontroller 16a to be programmed.

[0027] In use, the proximity of the user's body, for example a finger, to each one of the sensors 19 causes a change in the capacitance of the relative armatures 20, which, in turn, generates a respective electric signal, which is transformed by the control device 11 into a corresponding electric signal that is robust to interferences, so as to control the operation of the actuator cylinder 10.

[0028] The two sensors 19 control - one - the movement of the footrest 7 from its lowered rest position to its raised operating position and - the other one - the movement of the footrest 7 from its raised operating position to its lowered rest position.

[0029] In order to allow the user to identify the position of the two sensors 19 and, therefore, activate them, the system 9 comprises, for each sensor 19, a respective identifying element 21, which is mounted on the cover 6 in the area of the sensor 19.

[0030] The element 21 is pin-shaped and comprises a circular head 22, which is mounted on the outside of the cover 6; a threaded shank 23 extending through the cover 6 and the shell 13, inside a through sleeve 24 defined by the plates 14 and coaxial to the armatures 20; and a locking nut 25, which is screwed on the shank 23 to axially lock the element 21 on the shell 13.

[0031] The system 9 has some advantages, which are mainly due to the fact of being relatively simple, cheap and compact.

[0032] In particular, the actuating system 9 does not use any unipolar or shielded connection cables, which are normally used in current actuating systems to connect sensitive terminals arranged on the outside of the cover of the chair to capacitive sensors arranged on the inside of the stuffing of the chair, thanks to the control device 11 arranged between the stuffing 6 and the cover 6 and designed to transform the electric signal provided by its own capacitive sensors 19 into interference-robust control signals; therefore, the actuating system 9 is not affected by the problems caused by the aforesaid cables.

[0033] As a consequence, the system 9 can easily be mounted between the stuffing 5 and the cover 6, can be manufactured in one single model for all applications, regardless of the necessary length of the connection cable 17 between the control device 11 and the actuator cylinder 10, and has a relatively high degree of reliability.

Claims

1. A stuffed chair with one or more seats, in particular armchair or couch, comprising a seat (2); a backrest (3); a fixed part (8); at least one mobile part (7); and a actuating system (9) to move the mobile part (7) relative to the fixed part (8); the actuating system (9) comprising an actuating device (10) for the mobile part (7); and a control device (11) to selectively control the operation of the actuating device (10); and being **characterized in that** the control device (11) is mounted between a stuffing (5) and a cover (6) for the stuffing (5) itself, which is made of a textile comprising fabric, cloth, leather or artificial leather, and **in that** it comprises a printed circuit (15) integrating at least one proximity actuating element (19).

2. A stuffed chair according to claim 1, wherein each proximity actuating element (19) is defined by a capacitive proximity sensor (19).

3. A stuffed chair according to claim 2, wherein the capacitive proximity sensor (19) comprises two armatures (20) obtained on the printed circuit (15) and preferably with a circular shape.

4. A stuffed chair according to any of the previous claims, wherein the control device (11) comprises, furthermore, a containing shell (13), which is made of an electrically insulating material and holds, on the inside, the printed circuit (15).

5. A stuffed chair according to any of the previous claims and comprising, furthermore, for each proximity actuating element (19), a respective identifying element (21), which is arranged on the cover (6) of the stuffed chair in the area of the proximity actuating

element (19) itself.

6. A stuffed chair according to claim 5, when it depends on claim 4, wherein each identifying element (21) extends through - and is fixed to - said containing shell (13).

7. A stuffed chair according to claim 5 or 6, when depending on claim 4, wherein said containing shell (13) comprises two plates (14) coupled to one another and at least one through sleeve (24) defined by the plates (14), and said identifying element (21) comprises a head (22) mounted on the outside of the cover (6), a threaded shank (23) extending through the cover (6) and the containing shell (13), on the inside of the sleeve (24), and a locking nut (25), which is screwed on the shank (23) so as to axially lock the identifying element (21) on the containing shell (13).

8. A stuffed chair according to claims 3 and 7, wherein said armatures (20) are concentric to one another and said at least one sleeve (24) is coaxial to the armatures (20).

9. A stuffed chair according to any of the previous claims, wherein the printed circuit (15) integrates a first proximity actuating element (19) to control the movement of the mobile part (7) from a rest position to an operating position, and a second proximity actuating element (19) to control the movement of the mobile part (7) from the operating position to the rest position.

10. A stuffed chair according to any of the previous claims and comprising, furthermore, an electric cable (17) to connect the actuating device (10) and the control device (11) to one another.

11. A stuffed chair according to any of the previous claims, wherein the control device (11) comprises, furthermore, a connector (18) for the programming of the printed circuit (15).

12. A stuffed chair according to any of the previous claims, wherein said printed circuit (15) comprises electronic control means (16), which are designed to read a first signal provided by said proximity actuating element (19) and to transform the first signal into a corresponding second signal robust to electrostatic and electromagnetic interferences, which is capable of controlling said actuating device (10).

13. A stuffed chair according to claim 12, wherein said actuating device (10) comprises an electric motor (10a) and at leas one relative switch device (10b), preferably consisting of a relay; said second signal being designed to control the switch device (10b).

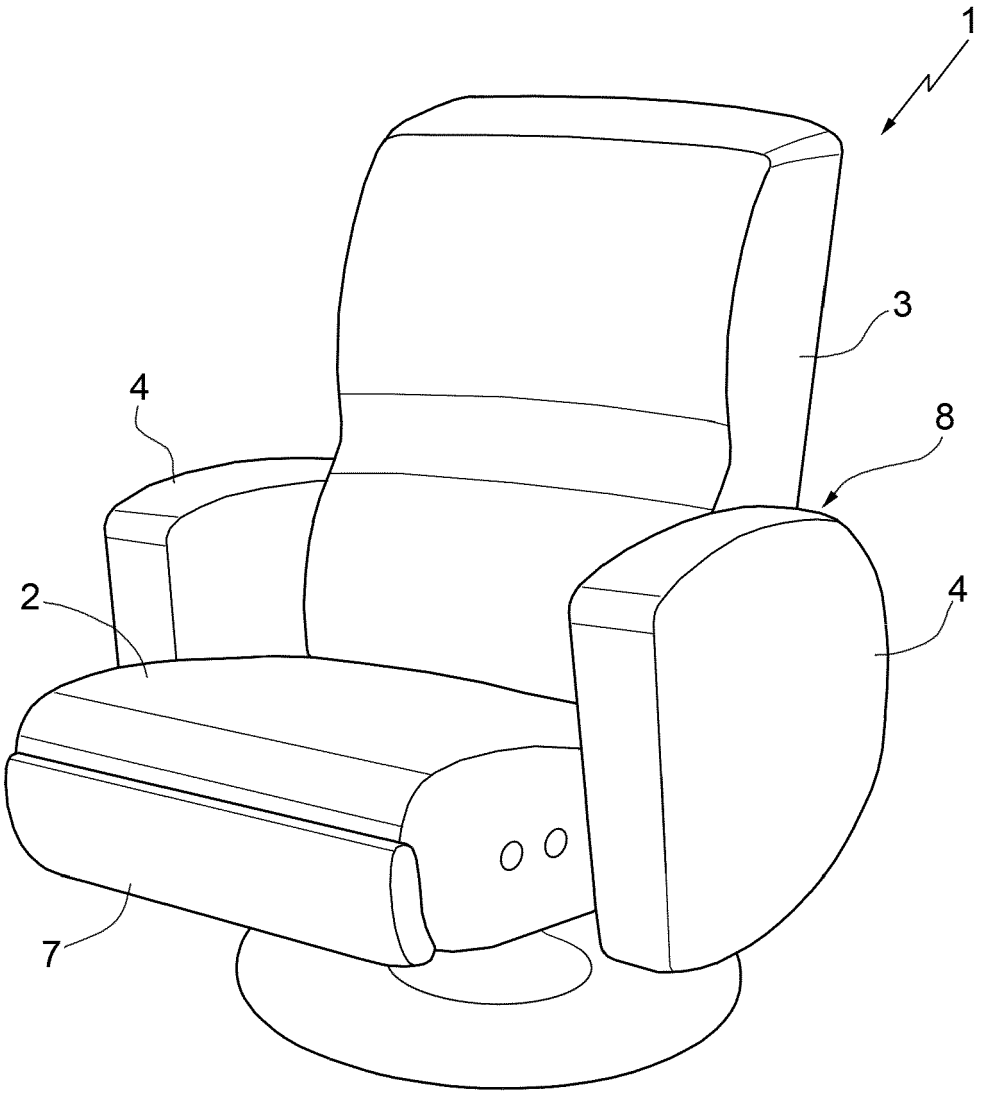

FIG.1

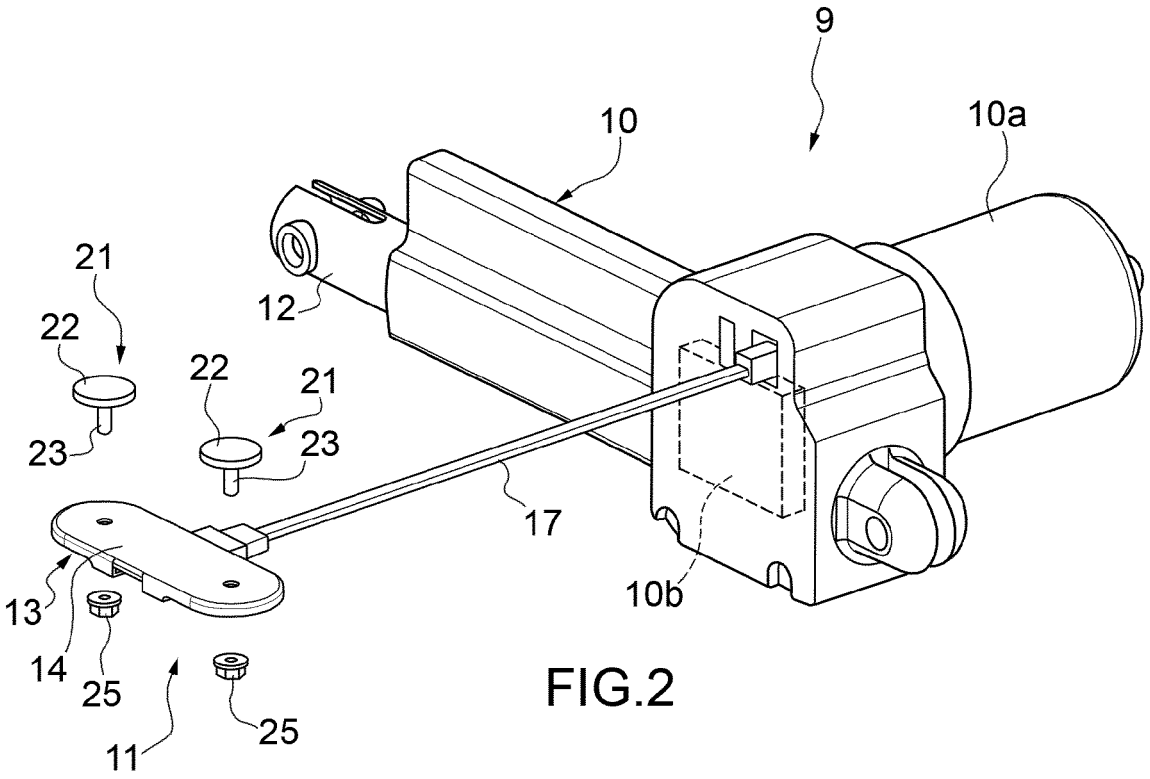
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FIG.2

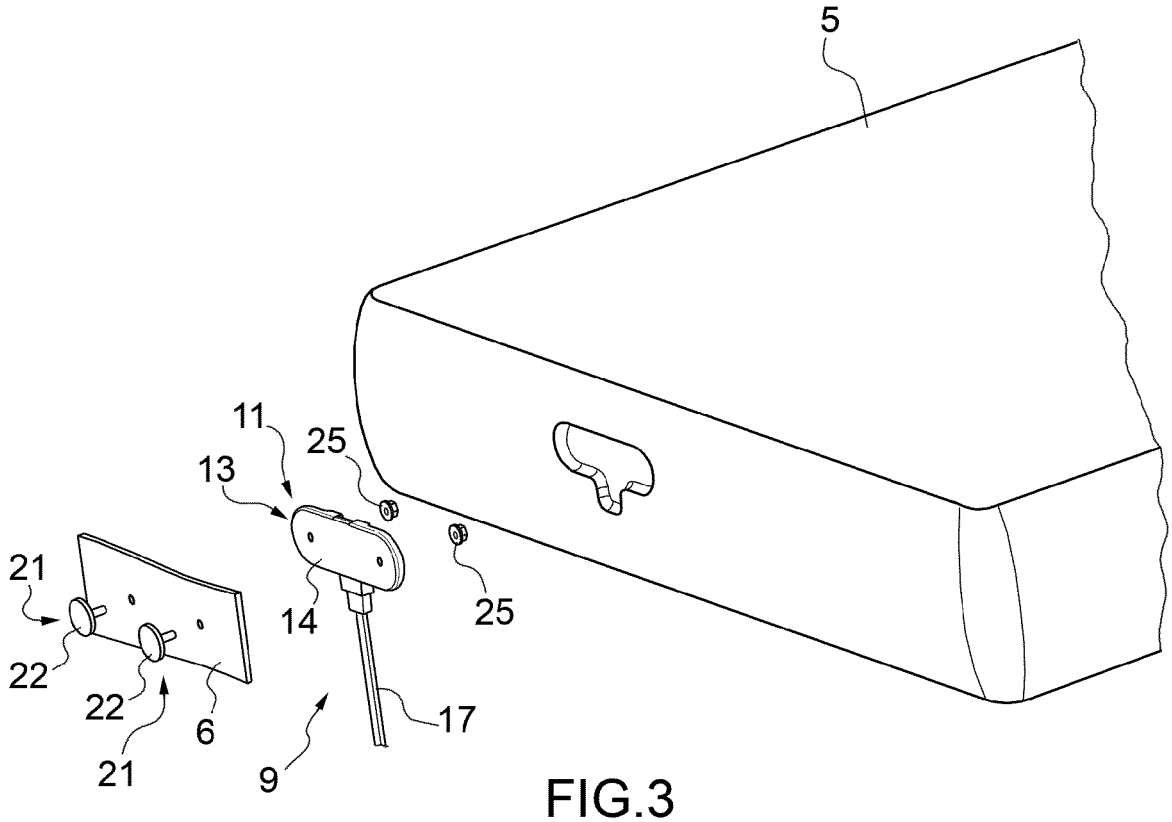
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FIG.3

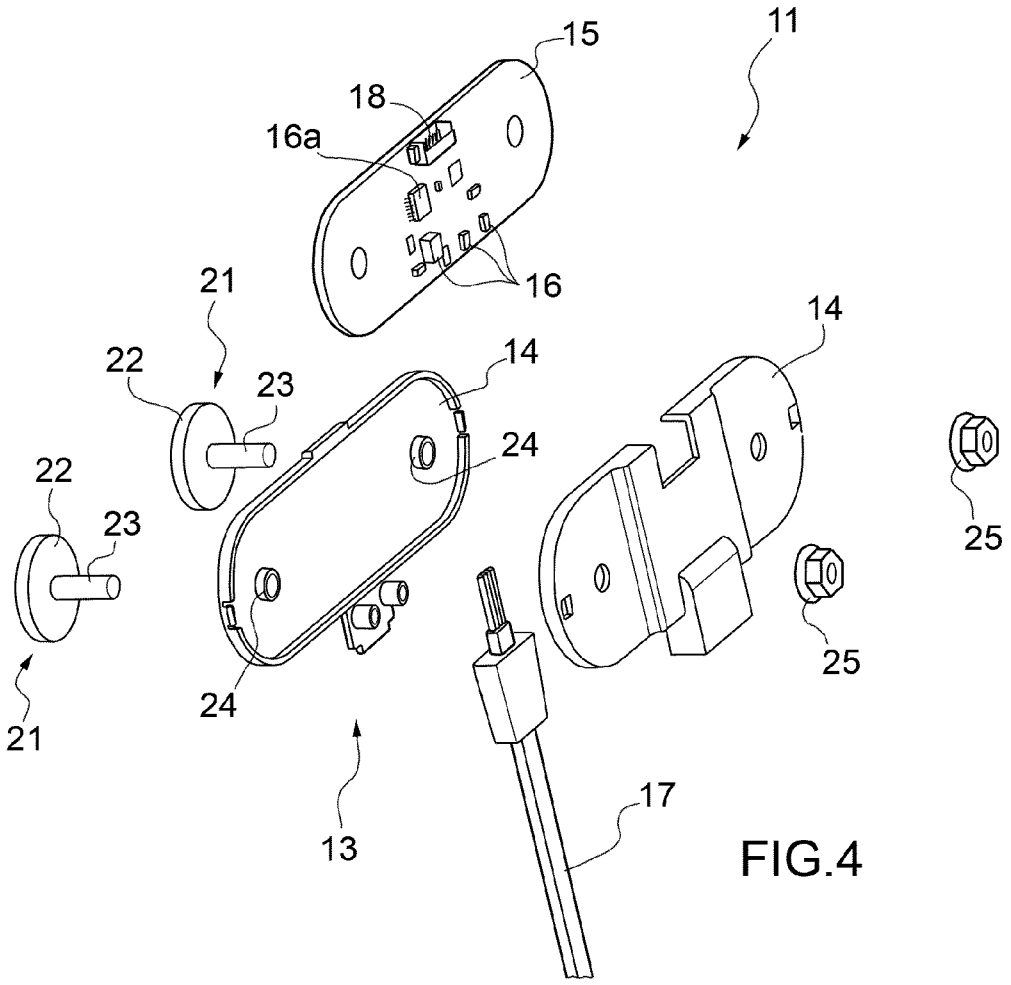

FIG.4

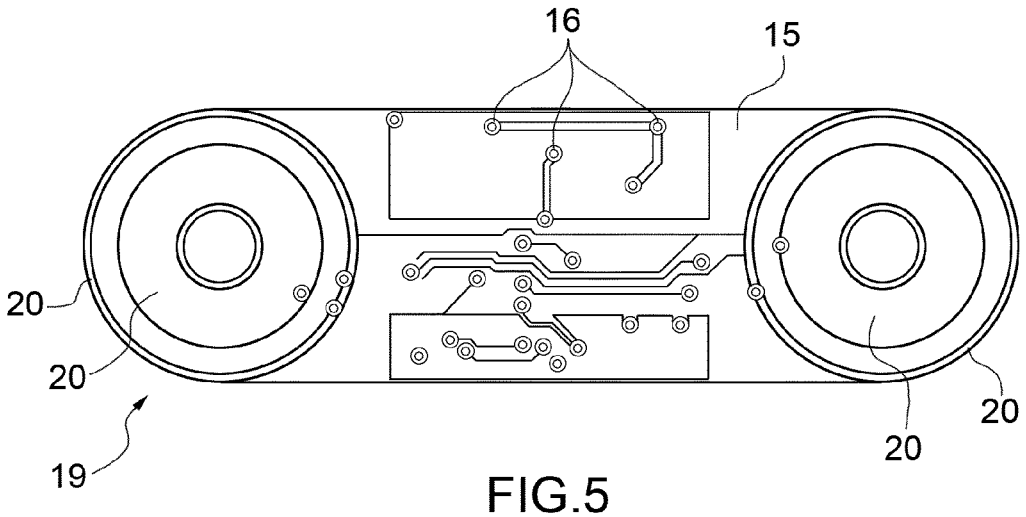

FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 16 16 7371

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	EP 2 745 743 A1 (LOGICDATA ELECT & SOFTWARE ENT) 25 June 2014 (2014-06-25) * abstract; figures 1,2A,2B * * column 1, paragraph 1 * * column 4, paragraphs 21,22,24 * * column 7, paragraphs 40,44 *	1-6,9-13	INV. A47C31/00 A47C1/02 A47C7/72
X	US 2004/212181 A1 (REES JOHN CHRISTOPHER) 28 October 2004 (2004-10-28) * abstract; figures 1-3 * * page 1, paragraph 17 * * page 2, paragraph 24 * * page 3, paragraphs 57,58 *	1,2,4	
X	WO 2012/061406 A2 (RAWLS-MEEHAN MARTIN B) 10 May 2012 (2012-05-10) * abstract; figures 1A,3 * * page 2, paragraph 9 * * page 96, paragraph 319 *	1	
A	US 2013/106164 A1 (CHACON RYAN) 2 May 2013 (2013-05-02) * abstract; figures 1,2 *	1	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	18 July 2016	Tempels, Marco

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18-07-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2745743 A1	25-06-2014	DE 102012112905 A1	26-06-2014
		EP 2745743 A1	25-06-2014
		US 2014197666 A1	17-07-2014
US 2004212181 A1	28-10-2004	AU 2002343064 A1	10-06-2003
		EP 1450647 A2	01-09-2004
		GB 2383745 A	09-07-2003
		GB 2383946 A	16-07-2003
		GB 2384172 A	23-07-2003
		GB 2384173 A	23-07-2003
		GB 2384422 A	30-07-2003
		US 2004212181 A1	28-10-2004
		WO 03045191 A2	05-06-2003
WO 2012061406 A2	10-05-2012	CN 103429212 A	04-12-2013
		US 2012138067 A1	07-06-2012
		US 2012186019 A1	26-07-2012
		US 2015059096 A1	05-03-2015
		WO 2012061406 A2	10-05-2012
US 2013106164 A1	02-05-2013	NONE	

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