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Amended claims in accordance with Rule 137(2) EPC.

(54) **Cabinet with pull-out shelf**

(57) A cabinet (1) is described, comprising an opening (2) defined by an angular border (20) and an upright (21) and a shelf (5) that can be pulled out of said opening to pass from a retracted position inside the cabinet to an extracted position outside the cabinet. The cabinet comprises: a column (C) disposed inside the cabinet behind

said upright (21), an L-shaped bracket (3) provided with a short arm (31) mounted to revolve around the column (C) and a long arm (32), a curved guide (4) joined with said shelf (5) wherein a pin (33) slides joined to said long arm (32) of the bracket, and a linear guide (6) joined to said long arm (32) of the bracket wherein a pin (8) slides and revolves joined to said shelf (5).

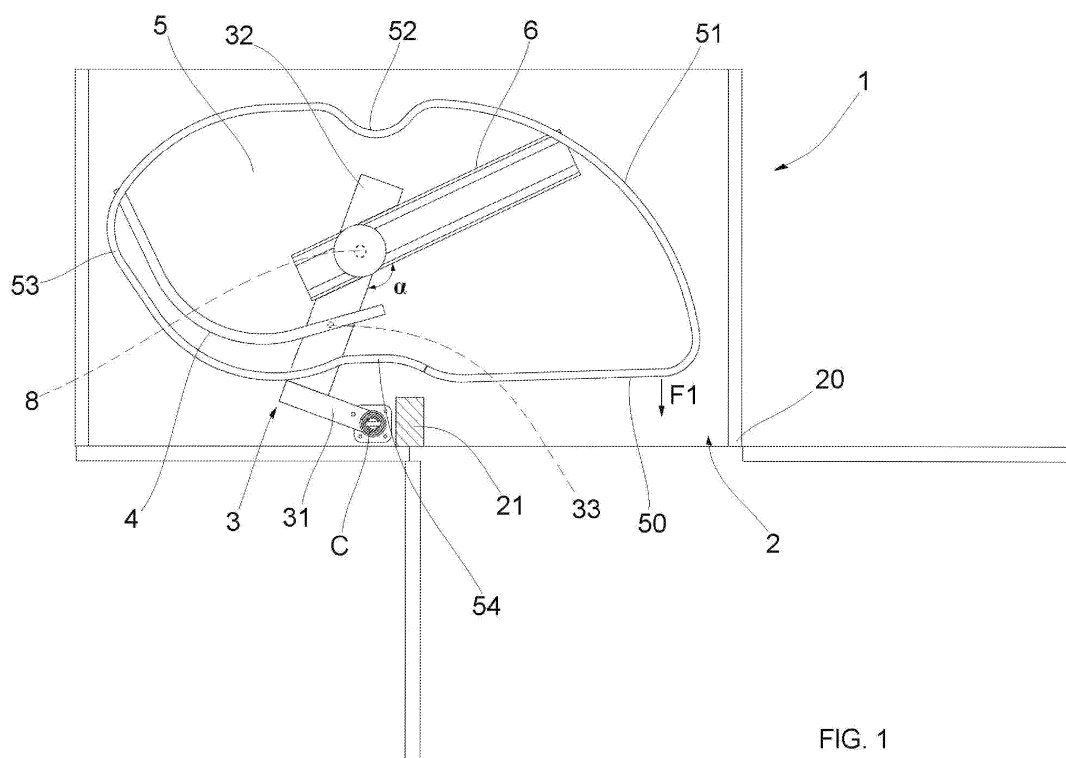


FIG. 1

Description

[0001] The present patent application for industrial invention relates to a cabinet with pull-out shelf.

[0002] As it is known, in interior decoration some types of furniture, in particular modular furniture, comprise various modules shaped as shelves used to support objects. Said modular furniture often develops on multiple walls. In this case the shelves of the modules disposed in corner position are difficult to access.

[0003] This results in the need to provide pull-out shelves that can be pulled out of the cabinet in order to make it easier for the user to collect and store objects on the shelves.

[0004] The German utility model DE 202 14 967 U1 describes a cabinet with a pull-out shelf joined to the door of the cabinet. The shelf is exactly shaped as a semicircle inscribed inside the rectangular perimeter of the cabinet and the centre is hinged to a column. In this way the opening of the door causes the rotation of the shelf that comes out of the cabinet.

[0005] However, the aforementioned embodiment is impaired by several drawbacks, which are mainly due to the fact that, in order to use the maximum area of the shelf, the dimensions of the cabinet are constrained by exact measures (the length must be two times the depth) and in any case the surface of the shelf is excessively smaller than the surface defined by the perimeter of the cabinet.

[0006] These drawbacks are solved, at least partially, in the patent for utility model DE 20 2007 010 283 U1 that discloses a shelf with curvilinear perimeter to use the largest surface possible. The shelf must make a rotation movement to be pulled-out of the cabinet. To that end a guide is obtained in the cabinet and a support arm is hinged in the cabinet.

[0007] However, said system is excessively cumbersome and complicated and causes jamming during rotation of the shelf.

[0008] Moreover, it must be considered that many cabinets are provided with upright disposed in the front central wall of the cabinet, in front of the column where the support of the pull-out shelf is hinged. Therefore, such upright hinders the rotation of the support of the pull-out shelf.

[0009] The purpose of the present invention is to eliminate the drawbacks of the known art, by disclosing a corner cabinet with upright and pull-out shelf that is versatile, practical for the user and able to use the largest surface possible of the shelf.

[0010] Said purpose has been achieved according to the invention with the characteristics described in the enclosed independent claim 1.

[0011] Advantageous embodiments of the invention are disclosed in the dependent claims.

The cabinet of the invention comprises an opening and a shelf that can be pulled out of said opening to go from a retracted position inside the cabinet to an extracted

position outside the cabinet.

The cabinet also comprises:

- a column disposed inside the cabinet in front central position,
- an L-shaped bracket that comprises a short arm mounted to revolve around said column and a long arm,
- a curved guide joined to said shelf wherein pin slides joined to said long arm of the bracket, and
- a linear guide joined to said long arm of the bracket where a pin slides and revolves joined to said shelf.

[0012] The advantages of the cabinet of the invention are evident, being provided with an actuation mechanism of the pull-out shelf characterised by total simplicity and reliability.

[0013] Additional characteristics of the invention will appear evident from the detailed description below, which refers to merely illustrative, not limiting embodiments, illustrated in the enclosed drawings, wherein:

Fig. 1 is a diagrammatic top view that shows the cabinet of the invention with shelf inside the cabinet;

Fig. 2 is the same as Fig. 1, with shelf being pulled-out;

Fig. 3 is the same as Fig. 1, with shelf pulled-out completely;

Fig. 4 is an exploded perspective view that shows the actuation mechanism of the pull-out shelf;

Fig. 5 is a perspective view of the mechanism of Fig. 4 in assembled condition;

Fig. 6 is a top view of a second embodiment of the cabinet of the invention with shelf inside the cabinet; and

Fig. 7 is the same as Fig. 6, with shelf pulled-out completely.

The cabinet of the invention is described with reference to the aforementioned figures, being generally indicated with reference numeral (1).

[0014] Referring to Fig. 1, the cabinet (1) is preferably shaped as parallelepiped with rectangular perimeter, with length double than depth. Nevertheless, the cabinet (1) can have any type of perimeter.

[0015] An opening (2) is obtained in the front of the cabinet (1), preferably with length equal to approximately half of the length of the cabinet. The opening (2) is defined by an angular border (20) and upright (21) extending in the front central part of the cabinet. The upright (21) is not mandatory.

[0016] A column (C) is mounted inside the cabinet (1), extending from the lower wall to the upper wall of the cabinet, behind the upright (21). Clearly, the column (C) may be only fixed to the lower wall or upper wall or lateral wall of the cabinet. An L-shaped bracket (3) is revolvingly supported by the column (C).

[0017] Also referring to Figs. 4 and 5, the bracket (3)

comprises a collar (30) mounted to revolve around the column (C), a short arm (31) and a long arm (32). The length of the short arm (31) is chosen so as to allow 90° rotation of the bracket (3), preventing the long arm (32) from interfering with the upright (21).

[0018] A vertical pin (33) is mounted on the long arm (32) of the bracket, near the central position. The pin (33) slides inside a curved guide (4) joined to the lower side of the pull-out shelf (5). The guide (4) is basically shaped as parabola or hyperbola disposed near the lateral border of said shelf. So the curved guide (4) acts as cam and the pin (33) acts as cam follower.

A linear guide (6) is fixed to the long arm (32) of the bracket. To that end, the long arm (32) is provided with a groove (34) where the linear guide (6) is fitted firmly. The linear guide (6) is a C-shaped section. Referring to Fig. 1, an obtuse angle (α) of approximately 150° - 160° is defined between the long arm (32) of the bracket and the linear guide (6).

[0019] A trolley (7) is mounted to slide in the linear guide (6). The trolley (7) can be provided with four wheels (70) with horizontal axis that roll inside the linear guide (6).

[0020] A pin (8) is revolvingly mounted in the trolley (7). The pin (8) has a flange (80) that is fixed to the lower side of the shelf (5) in central position on the shelf (5).

[0021] The shelf (5) has an irregular shape. Referring to Fig. 1, when the shelf is inside the cabinet (1), the front linear border (50) is joined with a curved linear border (51) that continues with a back border with a bend (52). The back border continues with a curved lateral border (53) that is joined with the front border (50) with a bend (54). The rear bend (52) is designed to pass the corner (20) of the cabinet; whereas the front bend (54) of the shelf is designed to pass the upright (21).

[0022] Following is a description of the operating principle of the actuation mechanism of the pull-out shelf (5).

[0023] Referring to Fig. 1, the pull-out shelf (5) is inside the cabinet. The user grabs the front part (50) of the pull-out shelf and pulls in the direction of the arrow (F1). Accordingly, the bracket (3) revolves around the column (C), whereas the shelf (5) revolves around the pin (8) mounted in the trolley (7).

Then the shelf (5) makes a revolution around the axis of the column (C) and a rotation around the axis of the pin (8), with a rototranslation movement that makes it partially come out of the opening (2) of the cabinet, as shown in Fig. 2. Nevertheless, in such a situation, part of the shelf (5) is still inside the cabinet, being inaccessible for the user.

[0024] Therefore, the user pulls the lateral border (51) of the shelf in the direction of the arrow (F2) that is basically parallel to the direction of the linear guide (6). Accordingly, the trolley (7) that supports the pin (8) slides in the linear guide (6), whereas the pin (33) joined to the arm (32) of the bracket slides inside the curved guide (4), forcing the shelf (5) to make a rototranslation that brings it to the position shown in Fig. 3.

[0025] In such a position the shelf (5) is pulled out of the cabinet completely and therefore perfectly accessible for the user.

[0026] In order to bring the shelf (5) inside the cabinet again, the user pushes the border of the shelf in the direction of the arrow (F3) basically parallel to the linear guide (6) and the shelf (5) makes a rototranslation in backward direction, returning to the position shown in Fig. 2. While the user continues on pushing the shelf towards the cabinet, the shelf (5) revolves around the pin (8) and the bracket (3) revolves around the column (C), bringing the shelf (5) back inside the cabinet, as shown in Fig. 1.

[0027] Figs. 6 and 7 show a second embodiment of the cabinet of the invention indicated with reference numeral (100), wherein identical elements or elements that correspond to the ones illustrated above are indicated with the same reference numerals, omitting a detailed description.

[0028] The cabinet (100) is provided with a lever (9) instead of the curved guide (4) shown in the cabinet (1). The lever (9) has a first end (90) hinged to the linear guide (6) and a second end (91) hinged to the shelf (5).

[0029] Exactly, the first end (90) of the lever (9) is hinged to a flange (65) that protrudes laterally from the linear guide in opposite position to the position where the long arm (32) intersects the linear guide (6). The second end (91) of the lever is hinged to a part (58) of the shelf disposed on the back border of the shelf between the rear bend (53) and the curved lateral border (52) of the shelf.

[0030] Numerous variations and modifications can be made to the present embodiments of the invention by an expert of the field, while still falling within the scope of the invention as claimed in the enclosed claims.

Claims

1. Cabinet (1; 100) comprising an opening (2) and a shelf (5) that can be pulled out of said opening to go from a retracted position inside the cabinet to an extracted position outside the cabinet,

characterised in that it also comprises:

- a column (C) arranged inside the cabinet in front central position of the cabinet,
- an L-shaped bracket (3) that comprises a short arm (31) mounted to revolve around said column (C) and a long arm (32),
- a linear guide (6) joined to the long arm (32) of the bracket, wherein a pin (8) slides and revolves, being joined to said shelf.
- guide means (4, 8; 9) disposed between said shelf (5) and said bracket (3) to allow rototranslation of said shelf (5).

2. Cabinet (1; 100) as claimed in claim 1, **character-**

ised in that said linear guide (6) is fixed on the long arm (32) of the bracket, in such a way to form an obtuse angle (α) between the long arm (32) and the linear guide (6).

3. Cabinet (1; 100) as claimed in claims 1 or 2, **characterised in that** said pin (8) is fixed in a central position of the shelf (5). 5
4. Cabinet (1; 100) as claimed in any one of the above claims, **characterised in that** it comprises a trolley (7) mounted with possibility of sliding inside the linear guide (6) and the pin (8) joined to the bracket being revolvingly mounted in said trolley. 10 15
5. Cabinet (1; 100) as claimed in claim 4, **characterised in that** said linear guide (6) consists in a profile with C-shaped cross-section and said trolley (7) comprises wheels (70) that roll inside the linear guide. 20
6. Cabinet (1; 100) as claimed in any one of the above claims, **characterised in that** the opening (2) of the cabinet is defined by an angular border (20) and an upright (21) disposed in front of said column (C). 25
7. Cabinet (1; 100) as claimed in claim 6, **characterised in that** the pull-out shelf (5) comprises a first bend (52) disposed in the central part of the back border in order not to interfere with said angular border (20) of the cabinet and a second bend (54) in the central part of the front border not to interfere with the upright (21). 30 35
8. Cabinet (1) as claimed in any one of the above claims, **characterised in that** said guide means (4, 8) comprise a curved guide (4) joined to said shelf (5) where a pin (33) slides, being joined to the long arm (32) of the bracket. 40
9. Cabinet (1) as claimed in claim 8, **characterised in that** the curved guide (4) is shaped as a parabola or hyperbola and is arranged near a lateral border of said shelf. 45
10. Cabinet (100) as claimed in any one of claims 1 to 7, **characterised in that** said guide means (9) comprise a lever (9) with first end (90) hinged to said linear guide (6) and second end (91) hinged to said shelf (5). 50

Amended claims in accordance with Rule 137(2) EPC. 55

1. Cabinet (1; 100) comprising an opening (2) and a

shelf (5) that can be pulled out of said opening to go from a retracted position inside the cabinet to an extracted position outside the cabinet, and a column (C) arranged inside the cabinet in front central position of the cabinet,

characterised in that it also comprises:

- an L-shaped bracket (3) that comprises a short arm (31) mounted to revolve around said column (C) and a long arm (32),
- a linear guide (6) joined to the long arm (32) of the bracket, wherein a pin (8) slides and revolves, being joined to said shelf,
- guide means (4, 8; 9) disposed between said shelf (5) and said bracket (3) to allow rototranslation of said shelf (5).

2. Cabinet (1; 100) as claimed in claim 1, **characterised in that** said linear guide (6) is fixed on the long arm (32) of the bracket, in such a way to form an obtuse angle (α) between the long arm (32) and the linear guide (6).

3. Cabinet (1; 100) as claimed in claims 1 or 2, **characterised in that** said pin (8) is fixed in a central position of the shelf (5).

4. Cabinet (1; 100) as claimed in any one of the above claims, **characterised in that** it comprises a trolley (7) mounted with possibility of sliding inside the linear guide (6) and the pin (8) joined to the bracket being revolvingly mounted in said trolley.

5. Cabinet (1; 100) as claimed in claim 4, **characterised in that** said linear guide (6) consists in a profile with C-shaped cross-section and said trolley (7) comprises wheels (70) that roll inside the linear guide.

6. Cabinet (1; 100) as claimed in any one of the above claims, **characterised in that** the opening (2) of the cabinet is defined by an angular border (20) and an upright (21) disposed in front of said column (C).

7. Cabinet (1; 100) as claimed in claim 6, **characterised in that** the pull-out shelf (5) comprises a first bend (52) disposed in the central part of the back border in order not to interfere with said angular border (20) of the cabinet and a second bend (54) in the central part of the front border not to interfere with the upright (21).

8. Cabinet (1) as claimed in any one of the above claims, **characterised in that** said guide means (4, 8) comprise a curved guide (4) joined to said shelf (5) where a pin (33) slides, being joined to the long arm (32) of the bracket.

9. Cabinet (1) as claimed in claim 8, **characterised in that** the curved guide (4) is shaped as a parabola or hyperbola and is arranged near a lateral border of said shelf.

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10. Cabinet (100) as claimed in any one of claims 1 to 7, **characterised in that** said guide means (9) comprise a lever (9) with first end (90) hinged to said linear guide (6) and second end (91) hinged to said shelf (5).

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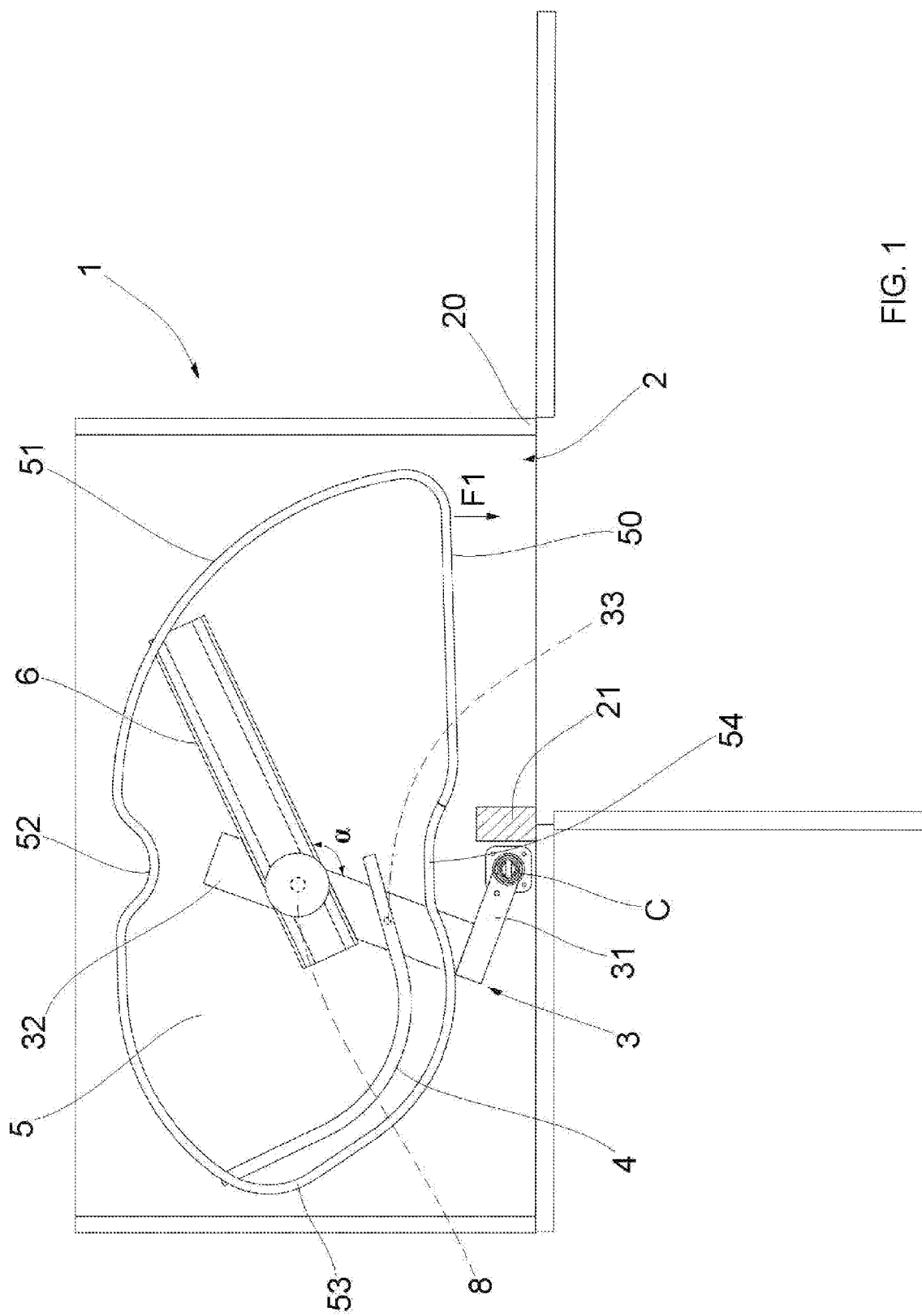
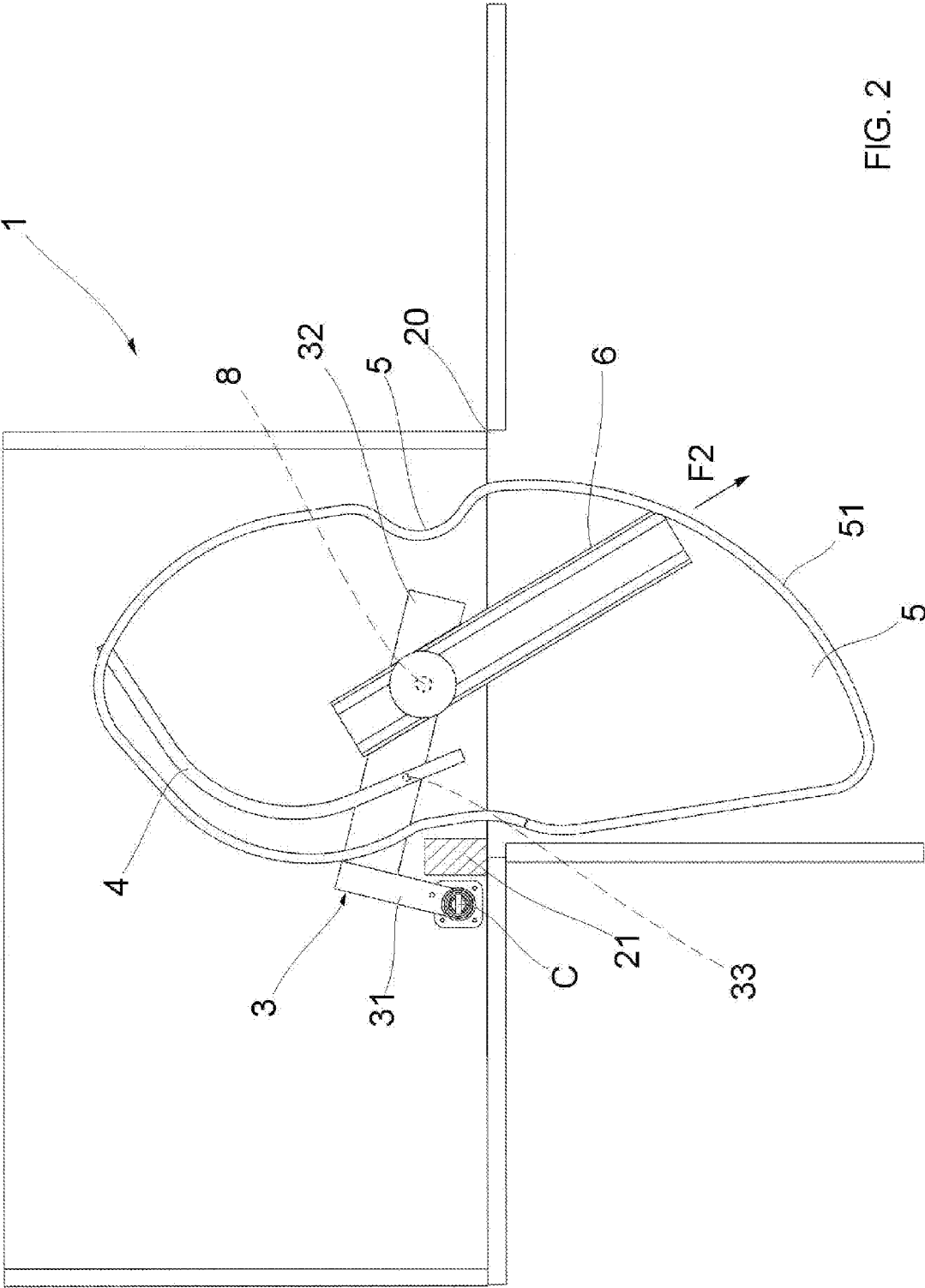
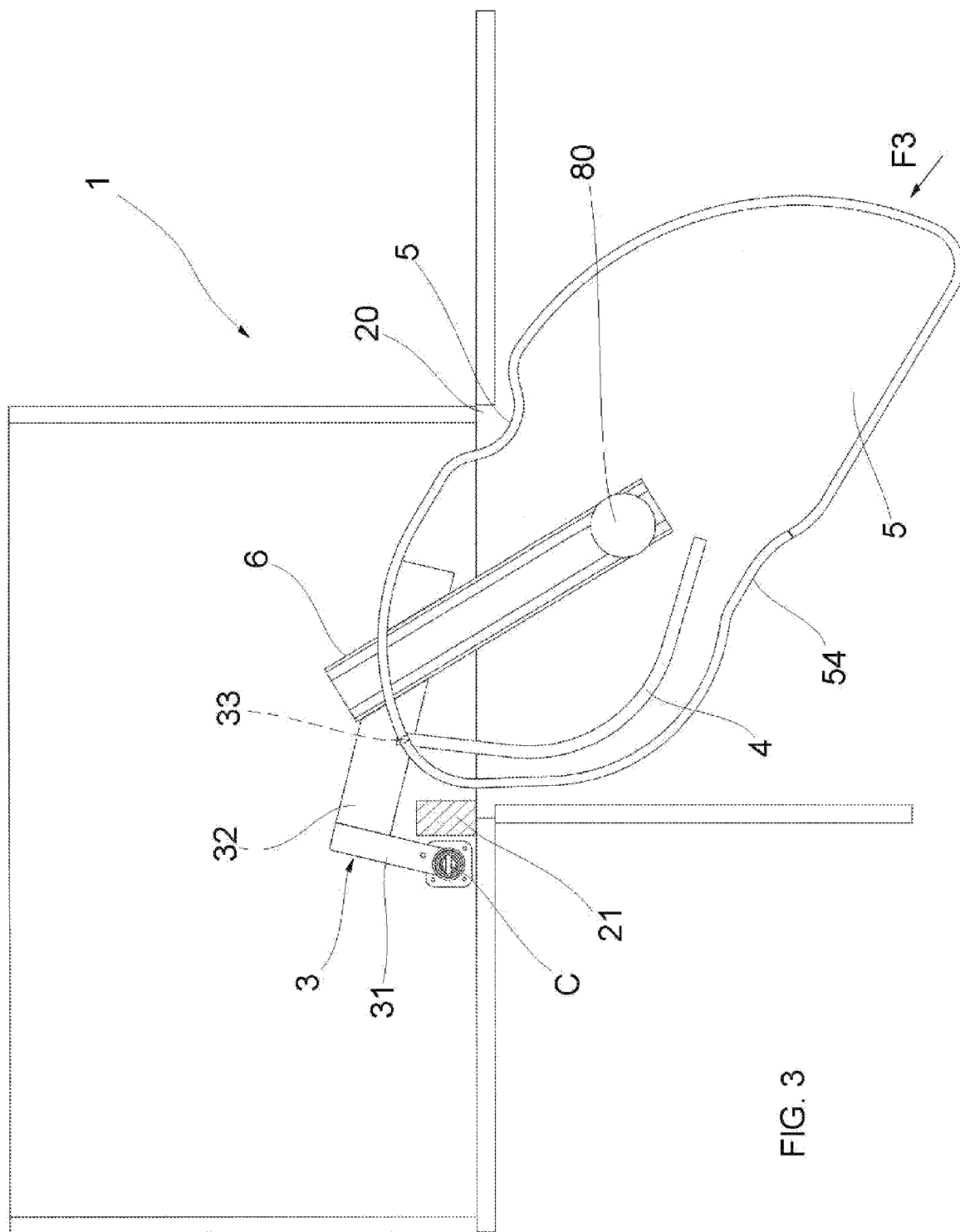


FIG. 1





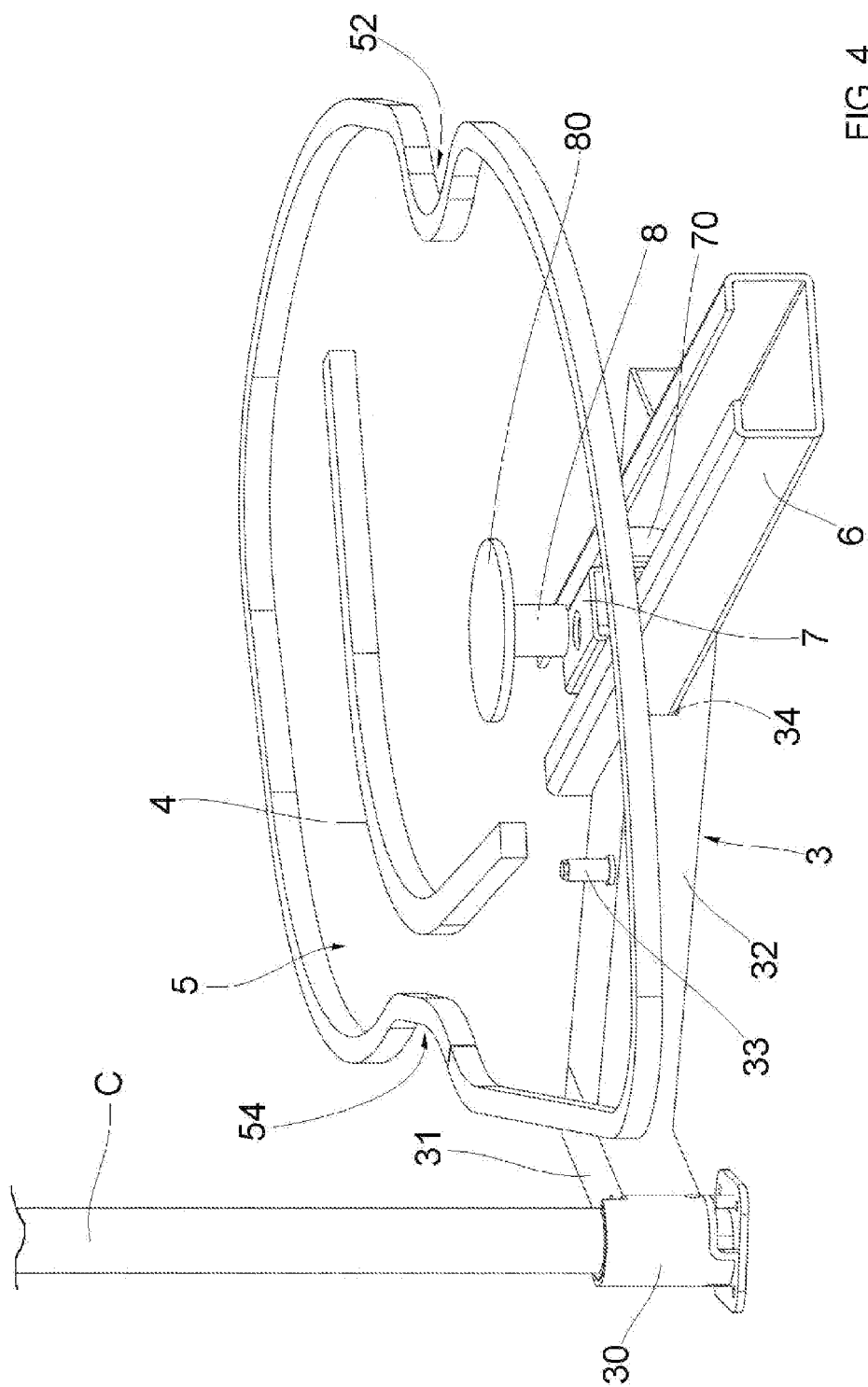


FIG. 4

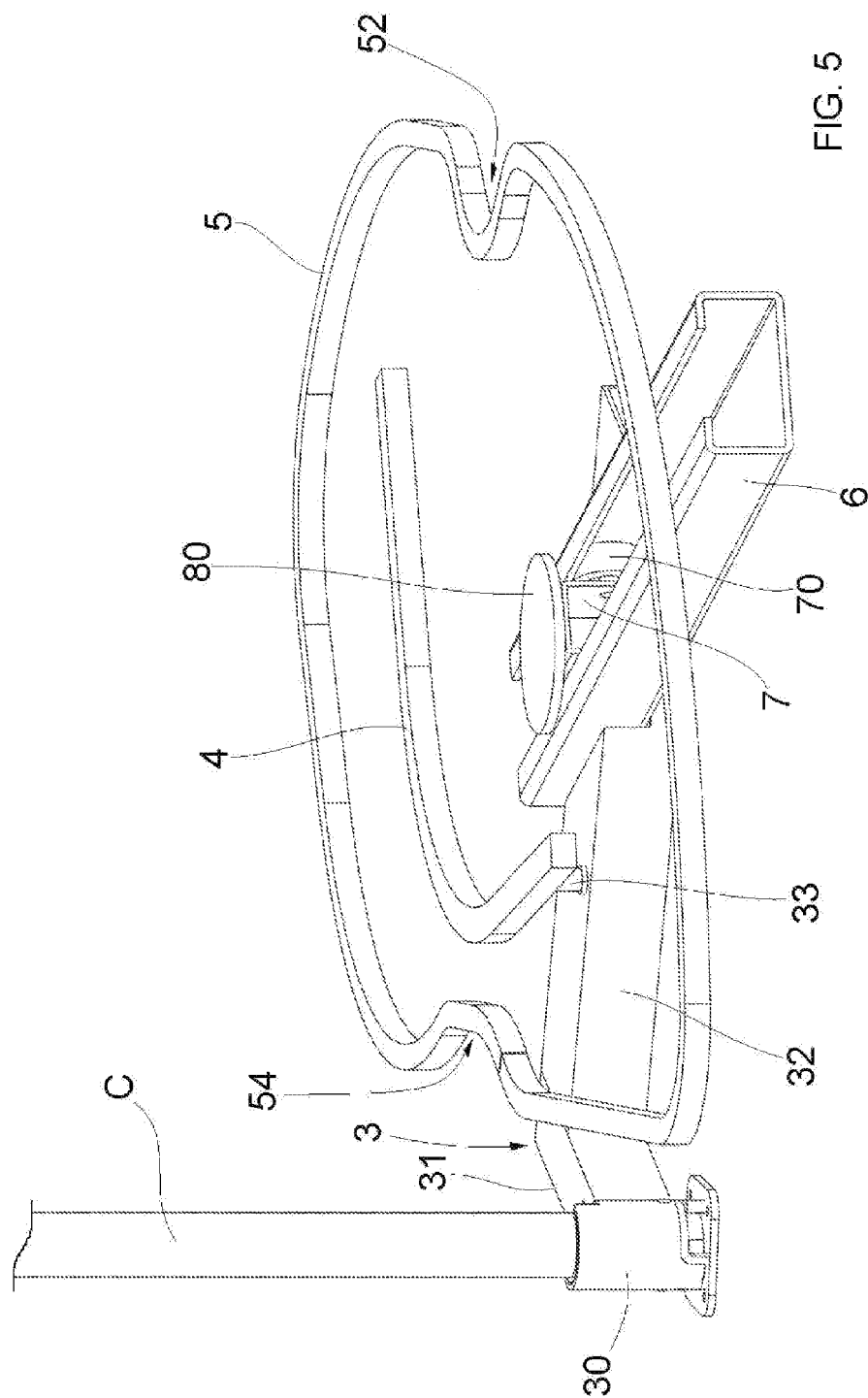
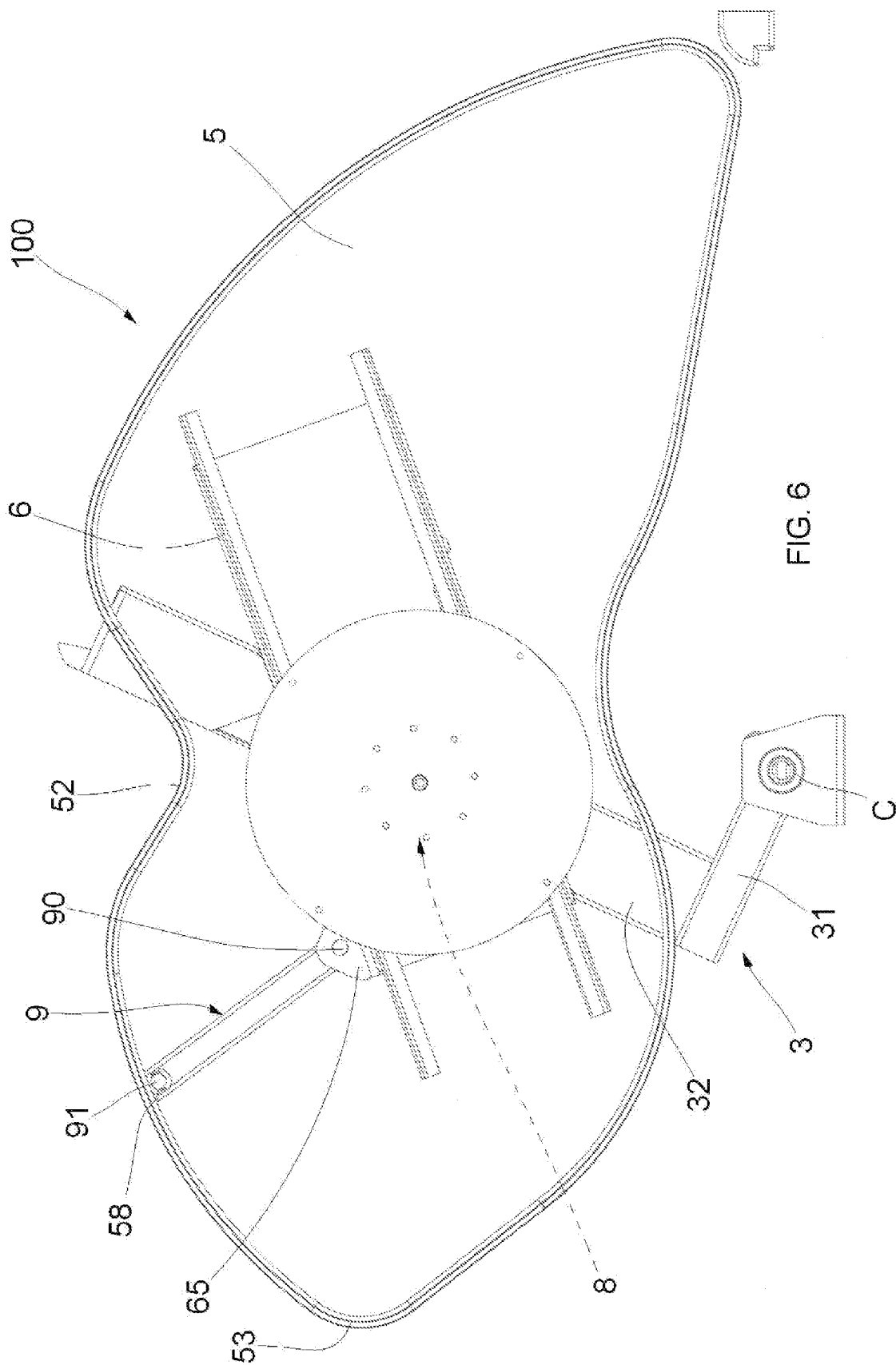
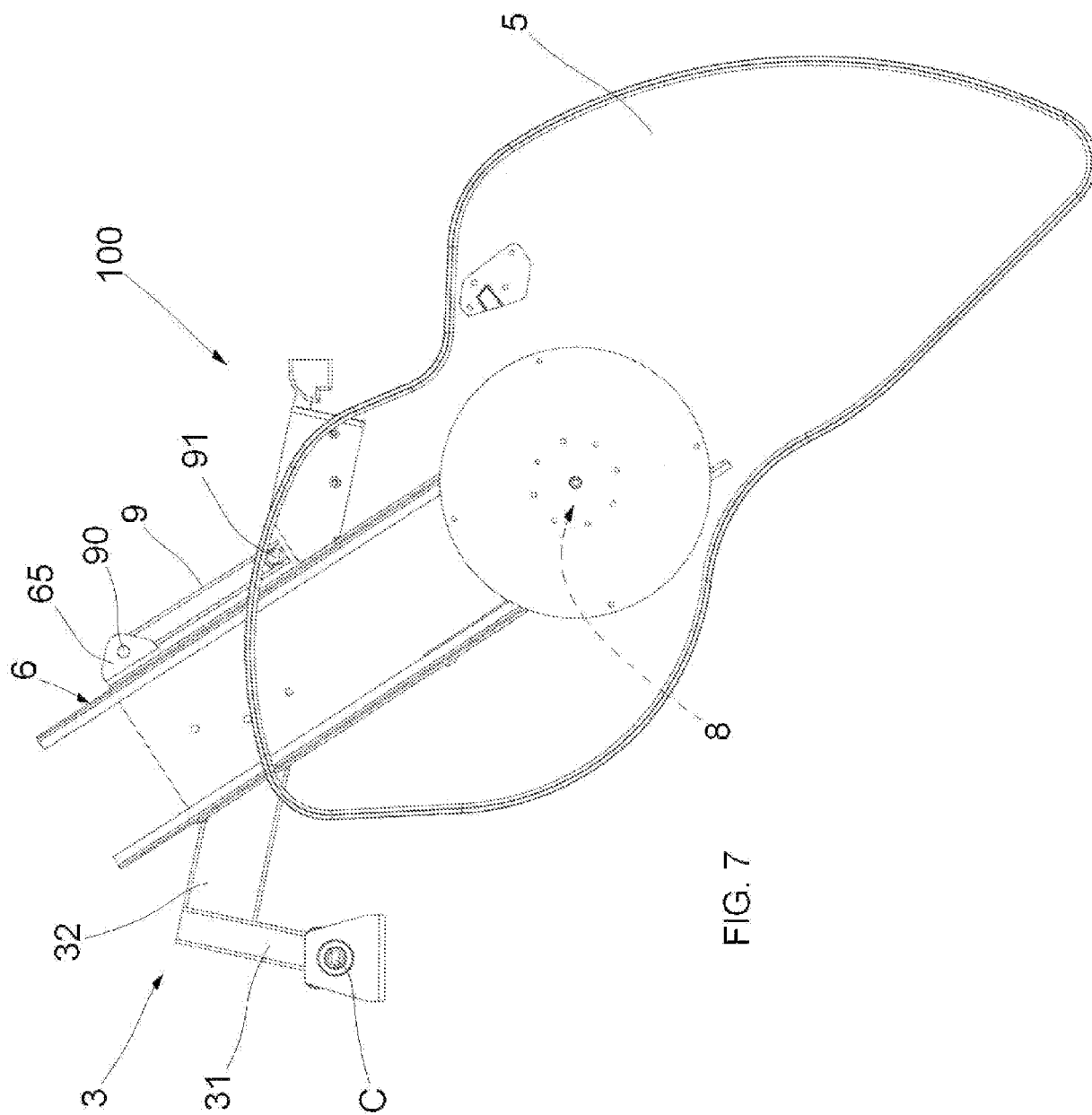


FIG. 5







EUROPEAN SEARCH REPORT

Application Number
EP 10 15 5370

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
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 July 2010	Examiner MacCormick, Duncan
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EPO FORM 1503 03.82 (P04C01)

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

EP 10 15 5370

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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23-07-2010

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REFERENCES CITED IN THE DESCRIPTION

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