



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.07.2011 Bulletin 2011/28

(51) Int Cl.:
F24C 15/16 (2006.01)

(21) Application number: **10194479.1**

(22) Date of filing: **10.12.2010**

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **31.12.2009 TR 200910057**

(71) Applicant: **BSH Bosch und Siemens Hausgeräte GmbH**
81739 München (DE)

(72) Inventors:

- **Gürdal, Ihsan Caner**
59850, Tekirdag (TR)
- **Kenar, Serdar**
59690, Tekirdag (TR)
- **Usta, Sabri**
59500, Tekirdag (TR)

(54) **An oven with a rotatable tray inside the cooking chamber thereof**

(57) The present invention relates to a cooker (10) with a cooking chamber (14) defined by an inner body (12), and a tray (20) which is positioned inside said cooking chamber (14) in a rotatable manner on a tray carrier (30). Said cooker comprises at least one rotating member

(47) which is coupled to said tray carrier (30) so as to contact with the tray (20) from the bottom surface thereof. The present invention also relates to a tray mechanism with a tray carrier (30) which is positioned inside the cooking chamber (14) of a cooker (10) and whereon a tray (20) is positioned so as to rotate around itself.

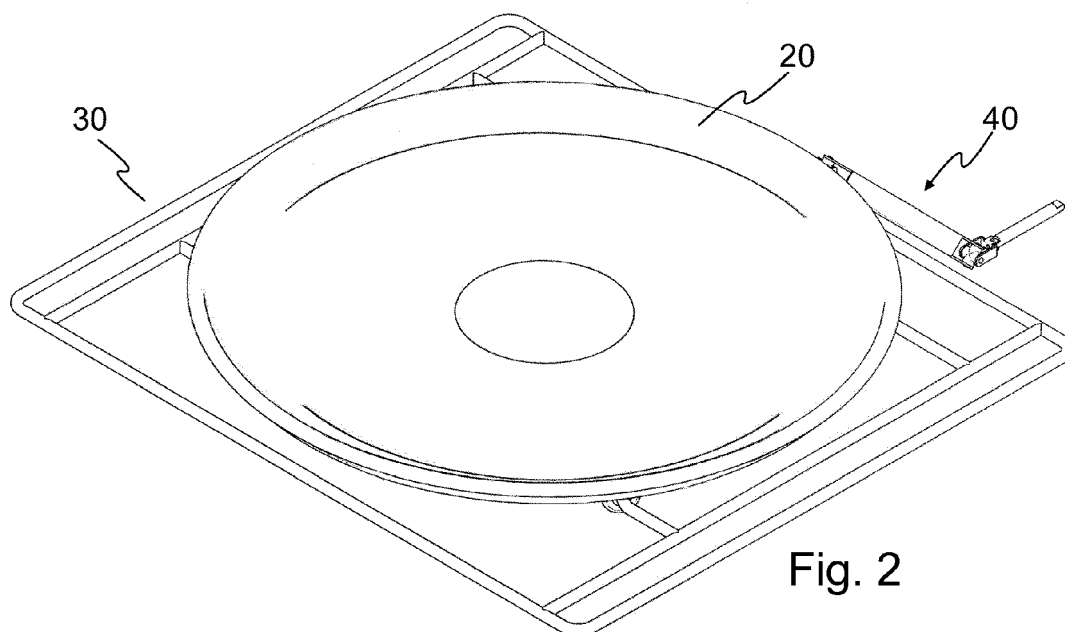


Fig. 2

Description**TECHNICAL FIELD**

5 **[0001]** The present invention relates to cookers comprising a cooking chamber defined by an inner body, and a tray which is positioned in a rotatable manner on a tray carrier inside said cooking chamber.

KNOWN STATE OF THE ART

10 **[0002]** Ovens have cooking chambers which are defined by the inner body they comprise and wherein the products to be cooked are placed. Trays placed inside the cooking chambers are fixed. Since the trays do not rotate around the own axis thereof, all of the sides of the foodstuff inside the trays are not cooked homogeneously. In the present art, some studies are realized for providing the rotation of trays inside the cooking chambers and for increasing cooking performance.

15 **[0003]** In the present systems, the rotation of the tray inside the cooker by means of a mechanical force is a standard property. Besides, in the cookers, there are no embodiments for the rotation of the tray by means of magnetic forces.

[0004] For instance, in the patent application EP1148766, a magnetic coupling mechanism is disclosed which is driven by the microwave oven and which rotates the turntable inside the cooking chamber.

20 **[0005]** In the patent application GB2051344, a mechanism is disclosed which is driven by the tray rotation motor of a microwave oven through the belt-pulley mechanism and which transfers this drive to the rotating tray through natural magnets.

[0006] As can also be seen from the abovementioned patents, in the present art, the rotation of the microwave ovens' tray inside the cooking chamber by means of magnetic forces is known. However, there is no such embodiment regarding freestanding ovens in the prior art.

25 **[0007]** As a result, because of the abovementioned problems, an improvement is required in the related technical field.

BRIEF DESCRIPTION OF THE INVENTION

30 **[0008]** An object of the subject matter invention is to provide an oven with a tray which can rotate around itself inside the cooking chamber.

[0009] Another object of the subject matter invention is to provide an oven with a tray which can be rotated around itself inside the cooking chamber of the oven by means of oven's present drive means.

[0010] Another object of the subject matter invention is to provide a freestanding oven comprising a tray which is rotated by a magnetic force.

35 **[0011]** Another object of the subject matter invention is to provide the cooking of all parts of the foodstuff inside the tray homogeneously.

[0012] In order to realize the abovementioned objects and all of the objects obtained from the detailed description below, the present invention relates to a cooker comprising a cooking chamber defined by an inner body, and a tray which is positioned inside said cooking chamber in a rotatable manner on a tray carrier. Said cooker comprises at least one rotating member which is coupled to said tray carrier so as to contact with the tray from the bottom surface thereof.

40 **[0013]** In a preferred embodiment of the present invention, there is at least one idle rotating member which is connected to said tray carrier so as to contact to the tray from the bottom surface thereof.

[0014] In another preferred embodiment of the present invention, in order to support the tray substantially, there are two idle rotating members and one actuated rotating member which are connected to said tray carrier so as to define the corner points of a triangle.

45 **[0015]** In a preferred embodiment of the present invention, said tray carrier comprises a frame which is formed by the bending of a wire so as to define a quadrangle.

[0016] In another preferred embodiment of the present invention, said frame comprises a connection rod whereon one each idle rotating member are positioned at two mutual ends thereof and which extends parallel to one edge of the frame in the inner part thereof.

50 **[0017]** In another preferred embodiment of the present invention, the connection rod comprises a bending point whereon the idle rotating members are positioned in an angled manner.

[0018] In another preferred embodiment of the present invention, there is a drive means and there is a movement transferring mechanism which transfers the drive of said drive means to the tray in order to rotate said tray around itself.

55 **[0019]** In another preferred embodiment of the present invention, there is a cardan mechanism which connects said drive means' shaft and the actuated rotating member.

[0020] In another preferred embodiment of the present invention, said cardan mechanism comprises a connection shaft whereon the actuated rotating member is positioned, first and second cardan shaft which provide the transferring

of the rotation movement obtained from said drive means to the actuated rotating member, an interconnection piece which connects said cardan shafts to each other and at least one shaft bearing where the connection shaft is bedded from one end.

[0021] In another preferred embodiment of the present invention, said frame comprises a shaft support bar where said shaft bearing is placed substantially in the middle point thereof and which extends substantially parallel to the connection bar so as to be close to the front edge.

[0022] In another preferred embodiment of the present invention, said drive means is a chicken roasting motor.

[0023] In another preferred embodiment of the present invention, said actuated rotating member is a circular magnet.

[0024] In another preferred embodiment of the present invention, said idle rotating member is a circular magnet.

[0025] In another preferred embodiment of the present invention, said cooker is an oven.

[0026] The present invention also relates to a tray mechanism which is positioned into the cooking chamber of a cooker and which has a tray carrier whereon a tray is placed in a rotatable manner. Said tray mechanism comprises at least one rotating member which is connected to said tray carrier so as to contact to the tray from the bottom surface thereof.

[0027] The additional characteristics and advantages of the subject matter invention are disclosed from the example embodiments giving reference to the accompanied figures.

BRIEF DESCRIPTION OF THE FIGURES

[0028] The oven realized in order to achieve the object of the subject matter invention is illustrated in the annexed figures, from these figures;

In Figure 1, the representative perspective view of an oven where the subject matter invention is applied is given.

In Figure 2, the view of the tray carrier, cardan mechanism and the rotating tray positioned inside the cooking chamber is given.

In Figure 3, the solo view of tray carrier illustrated in Figure 2 is given.

In Figure 4, the dismantled view of the cardan mechanism is given.

In Figure 5, the detailed view of the cardan mechanism is given.

THE DETAILED DESCRIPTION OF THE INVENTION

[0029] In this detailed explanation, the subject matter invention is explained with references to figures without forming any restrictive effect in order to make the subject more understandable. Accordingly, in the detailed description below, the subject matter invention is assumed to be applied to an oven (10). However, with minor revisions, the subject matter invention can also be applied to household type or industrial type cookers with different properties.

[0030] With reference to Figure 1, an oven (10) where the subject matter invention is applied has a cooking chamber (14) which is accessed through a cover (11). With reference to Figure 2, said cooking chamber (14) is defined by an inner body (12) whose one lateral surface corresponding to the cover (11) is open and which is in the form of a rectangular prism. A front flange (13) is assembled to the circumference of said open surface.

[0031] With reference to Figure 2, a tray (20) in a rotatable manner is positioned onto a tray carrier (30) placed into said cooking chamber (14). In order to rotate said tray (20) around itself, there is a movement transferring mechanism which transfers the drive of a present drive mechanism to the tray (20). Said movement transferring mechanism is a cardan mechanism (40) and the drive mechanism is a chicken roasting motor.

[0032] With reference to Figure 3, said tray carrier (30) comprises a frame (31) formed by the bending of a wire in rectangular form; support bar (32) providing support to said frame (31); connection bar (33) carrying the shaft connected to the movement mechanism; and shaft support bar (34) carrying the shaft connected to the drive mechanism and carrying the actuated rotating member (47). Said frame (31) comprises lateral edge (313) extending on two lateral sides thereof and front and rear edges (311, 312) connecting the lateral edges (313) to each other.

[0033] Accordingly, there are preferably two support bars (32) and each support bar (32) extends between the front and rear (311, 312) edges and parallel to a lateral edge (313). Between the support bars (32), there is a connection bar (33) extending close to the front edge (312) and there is a shaft support bar (34) extending close to the rear edge (311). There are two bending points (331) on the connection bar (33). Two idle rotating members (35) are positioned to said bending points (331) so as to extend in an angled manner. The tray (20) rotates easily on the idle rotating members (35) and at the same time, the tray (20) is attracted by the magnets by means of the magnetic force so that it does not displace. The shaft support bar (34) extends along the front edge (311) at a place close to the front edge (311).

[0034] With reference to Figure 3 and 4, said actuated rotating member (47) takes the drive forces from the chicken roasting motor (not illustrated in the figure) by means of a cardan mechanism (40). Said cardan mechanism (40) comprises a connection shaft (45) to which a actuated rotating member (47) is connected; and the first and second cardan shafts

(42, 43) which transfer the rotation movements of the motor connection and magnet connection shafts (41, 45) to each other. Said cardan shafts (42, 43) are connected to each other by means of the interconnection piece (44).

[0035] Under the light of the abovementioned structural details, the operation of the subject matter invention is as follows. First of all, the drive force rotates the motor connection shaft (41). The first cardan shaft (42) at the end of the motor connection shaft (41) increases the rotation angle and it transfers the drive it obtains to the second cardan shaft (43) by means of the interconnection piece (44). The second cardan shaft (43) changes the rotation angle and it finally transfers the rotation movement to the connection shaft (45) which is connected to the actuated rotating member (47). The connection shaft (45) is in the form of a square bar. The hub space of said actuated rotating member (47) is in the form of a square which is compliant to the connection shaft (45) and they rotate together by forming shape coupling. The connection shaft (45) is fixed on the tray carrier (30) inside the shaft bearing (46). There are two shaft bearings (46) which are in semi-circular form and which are positioned mutually. One of said shaft bearings (46) is seated to the shaft bearing recess (341) on the shaft support bar (34) and the other one is seated to the shaft bearing recess (314) on the front edge (311). Between said shaft bearings, the connection shaft extends.

[0036] As a result, by means of the subject matter invention, the tray (20) which is positioned inside the cooking chamber (14) is rotated by the cardan mechanism (40) and the tray carrier (30). By means of this, all parts of the foodstuff inside the tray (20) are cooked homogeneously.

[0037] The protection scope of the present invention is set forth in the annexed Claims and cannot be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

REFERENCE NUMBERS

[0038]

10 Oven	33 Connection bar
11 Cover	331 Bending point
12 Inner body	34 Shaft support bar
13 Front flange	341 Shaft bearing recess
14 Cooking chamber	35 Idle rotating member
20 Tray	40 Cardan mechanism
30 Tray carrier	41 Motor connection shaft
31 Frame	42 First cardan shaft
311 Front edge	43 Second cardan shaft
312 Rear edge	44 Interconnection piece
313 Lateral edge	45 Connection shaft
314 Shaft bearing recess	46 Shaft bearing
32 Support bars	47 Actuated rotating member

Claims

1. A cooker (10), especially an oven, with a cooking chamber (14) defined by an inner body (12), and a tray (20) which is positioned inside said cooking chamber (14) in a rotatable manner on a tray carrier (30), **characterized by** comprising at least one rotating member (35, 47) which is coupled to said tray carrier (30) so as to contact with the tray (20) from the bottom surface thereof.

2. A cooker (10) according to claim 1, wherein at least one idle rotating member (35) is provided which is connected to said tray carrier (30) so as to contact to the tray (20) from the bottom surface thereof.
- 5 3. A cooker (10) according to claim 1 or 2, wherein, in order to support the tray (20) substantially, two idle and one actuated rotating members (35, 47) are provided which are connected to said tray carrier (30) so as to define the corner points of a triangle.
- 10 4. A cooker (10) according to any of the preceding claims, wherein said tray carrier (30) comprises a frame (31) which is formed by the bending of a wire so as to define a quadrangle, especially wherein said frame (31) comprises a connection rod (33) whereon one each idle rotating member (35) are positioned at two mutual ends thereof, and which extends parallel to one edge of the frame (31) in the inner part thereof, especially wherein the connection rod (33) comprises a bending point (331) whereon the idle rotating members (35) are positioned in an angled manner.
- 15 5. A cooker (10) according to any of the preceding claims, wherein a drive means is provided and a movement transferring mechanism is provided which transfers the drive of said drive means to the tray (20) in order to rotate said tray (20) around itself.
- 20 6. A cooker (10) according to claim 5, wherein a cardan mechanism (40) is provided which connects said drive means' shaft and the actuated rotating member (47), especially wherein said cardan mechanism (40) comprises a connection shaft (45) whereon the actuated rotating member (47) is positioned, first and second cardan shaft (42, 43) which provide the transferring of the rotation movement obtained from said drive means to the actuated rotating member (47), an interconnection piece (44) which connects said cardan shafts (42, 43) to each other and at least one shaft bearing (46) where the connection shaft (45) is bedded from one end, especially wherein said frame (31) comprises a shaft support bar (34) where said shaft bearing is placed in the middle point thereof and which extends substantially parallel to the connection bar (33) so as to be close to the front edge.
- 25 7. A cooker (10) according to any of the preceding claims, wherein said drive means is a chicken roasting motor.
- 30 8. A tray mechanism with a tray carrier (30) positionable inside a cooking chamber (14) of a cooker (10) and whereon a tray (20) is positioned so as to rotate around itself, **characterized by** comprising at least one rotating member (35, 47) which is coupled to said tray carrier (30) so as to contact with the tray (20) from the bottom surface thereof.
- 35 9. A tray mechanism according to claim 8, wherein at least one idle rotating member (35) is provided which is connected to said tray carrier (30) so as to contact to the tray (20) from the bottom surface thereof.
- 40 10. A tray mechanism according to claim 8 or 9, wherein, in order to support the tray (20) substantially, two idle and one actuated rotating members (35, 47) are provided which are connected to said tray carrier (30) so as to define the corner points of a triangle.
- 45 11. A tray mechanism according to any of the preceding claims 8 to 10, wherein said tray carrier (30) comprises a frame (31) which is formed by the bending of a wire so as to define a quadrangle.
12. A tray mechanism according to claim 11, wherein said frame (31) comprises a connection rod (33) whereon one each idle rotating member (35) are positioned at two mutual ends thereof and which extends parallel to one edge of the frame (31) in the inner part thereof.
13. A tray mechanism according to claim 12, wherein the connection rod (33) comprises a bending point (331) whereon the idle rotating members (35) are positioned in an angled manner.
- 50 14. A tray mechanism according to any of the preceding claims 8 to 13, wherein a drive means is provided and a movement transferring mechanism is provided which transfers the drive of said drive means to the tray (20) in order to rotate said tray (20) around itself, especially wherein a cardan mechanism (40) is provided which connects said drive means' shaft and the actuated rotating member (47).
- 55 15. A tray mechanism according to any of the preceding claims between 8 to 14, wherein an actuated rotating member (47) is a circular magnet, and/or an idle rotating member (35) is a circular magnet.

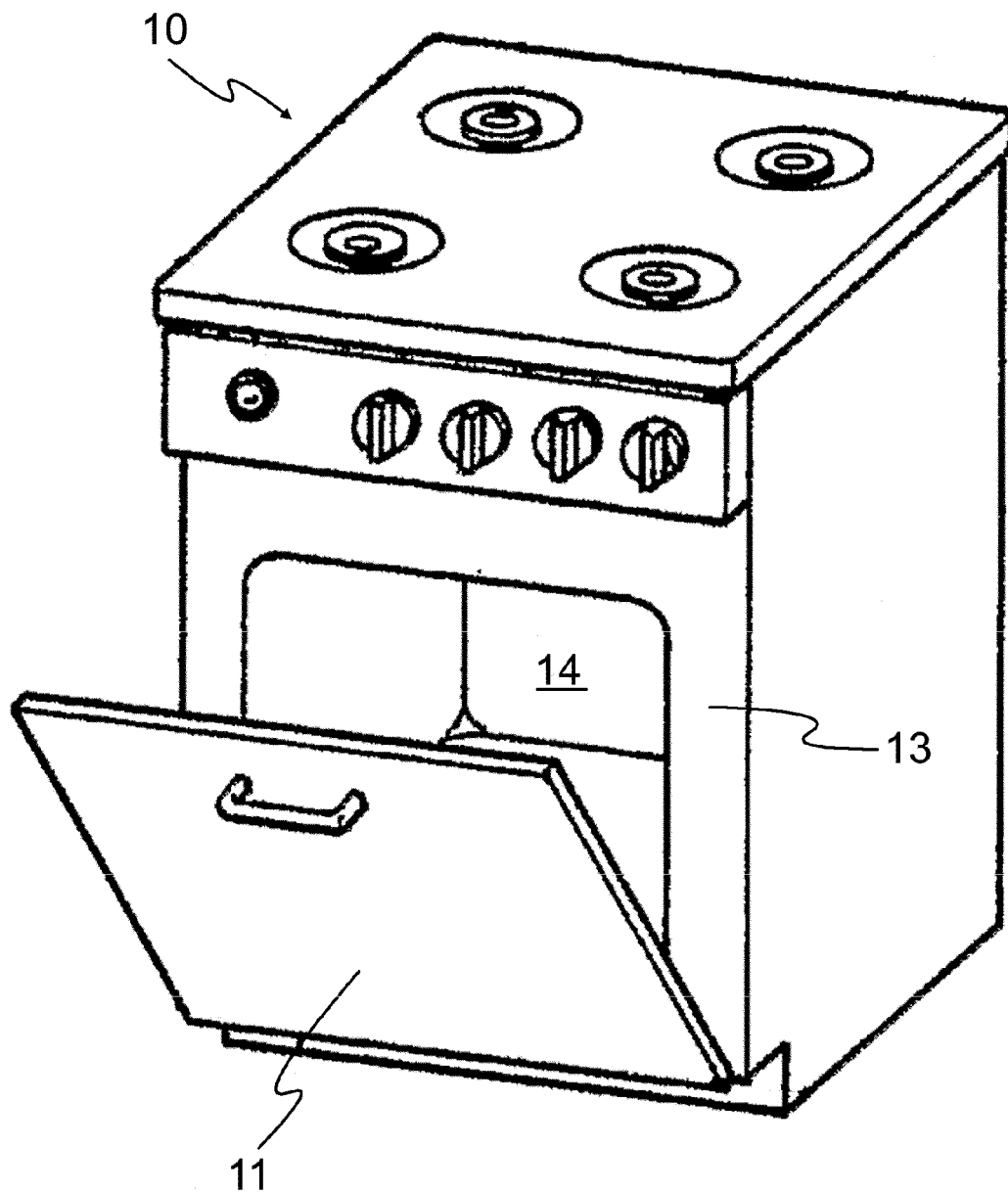
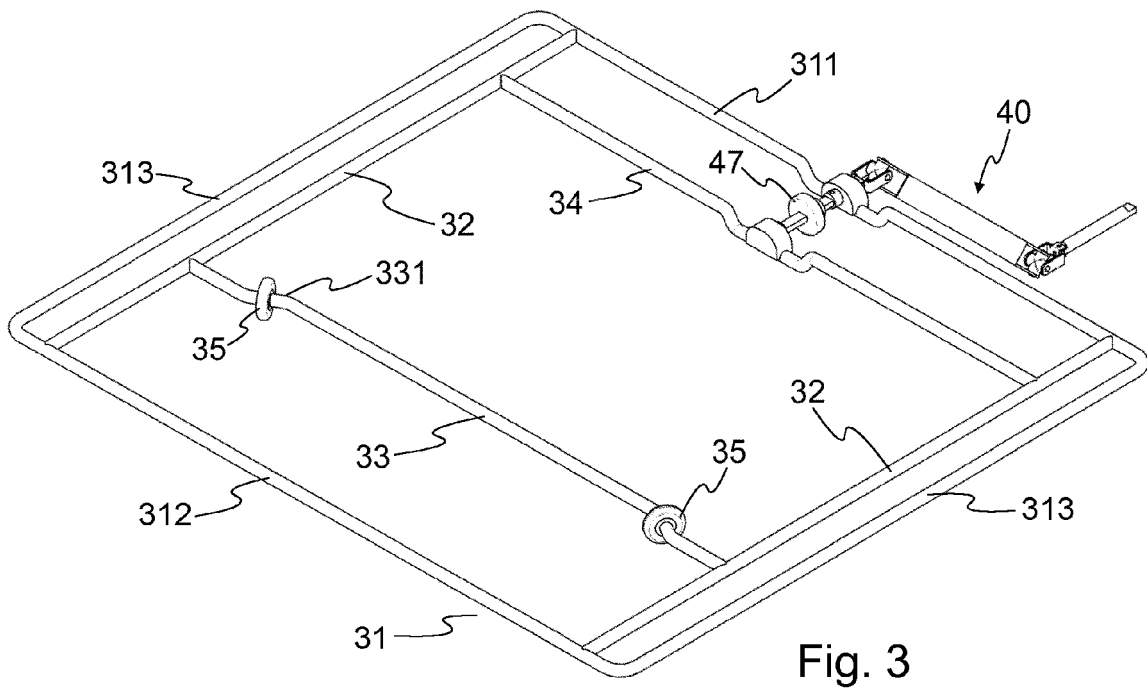
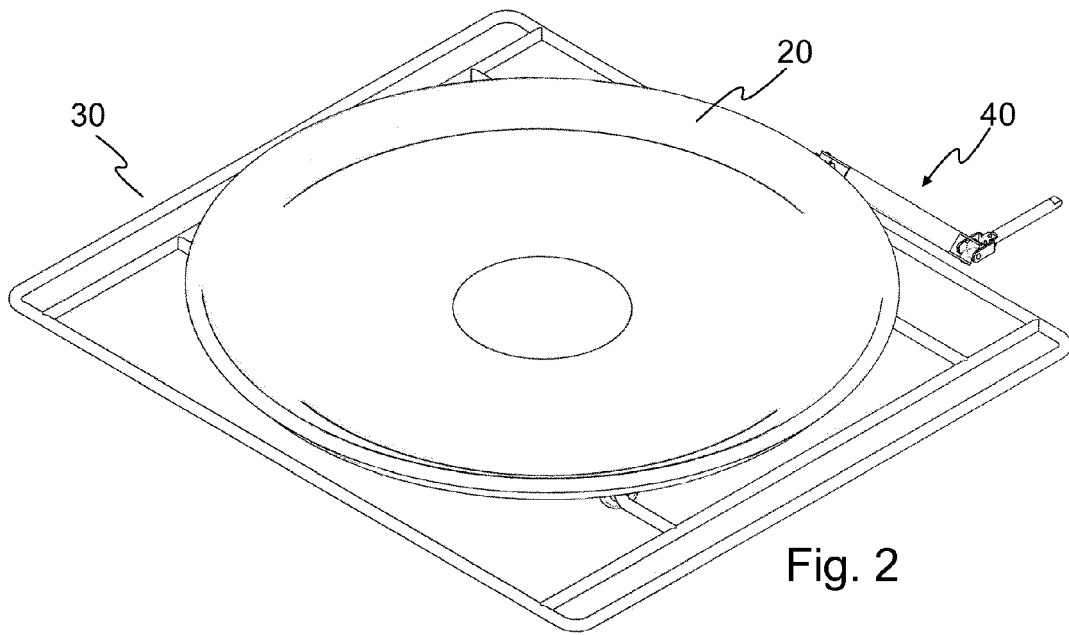
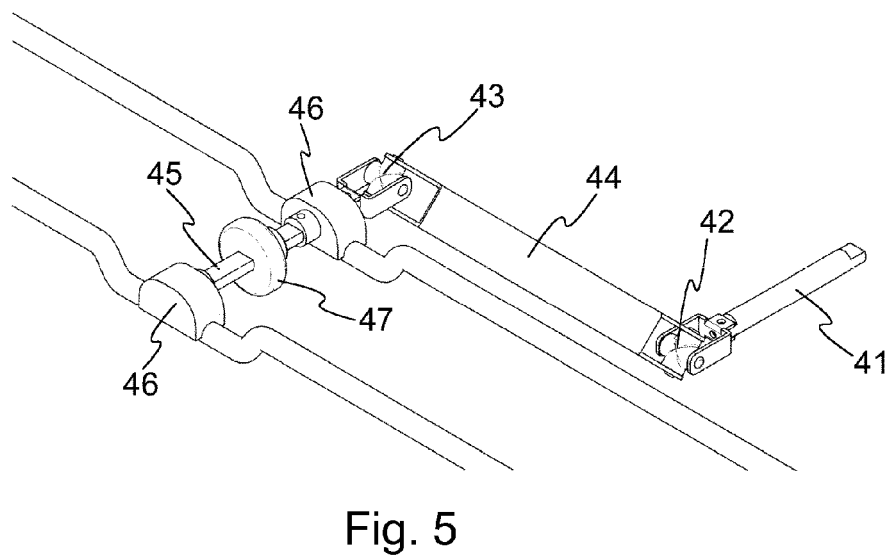
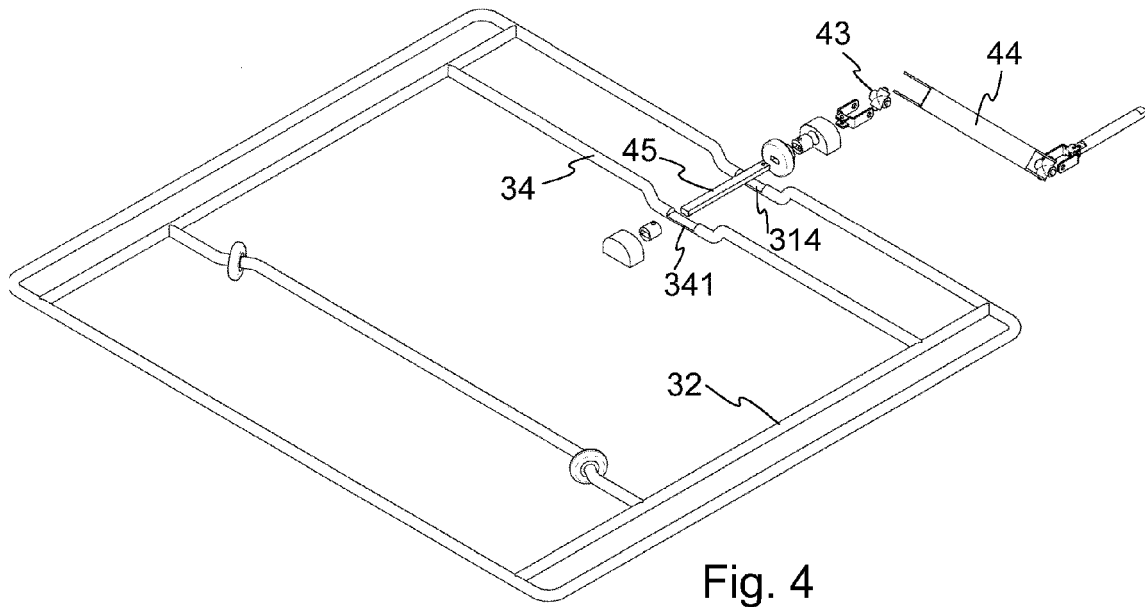


Fig. 1





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

- EP 1148766 A [0004]
- GB 2051344 A [0005]