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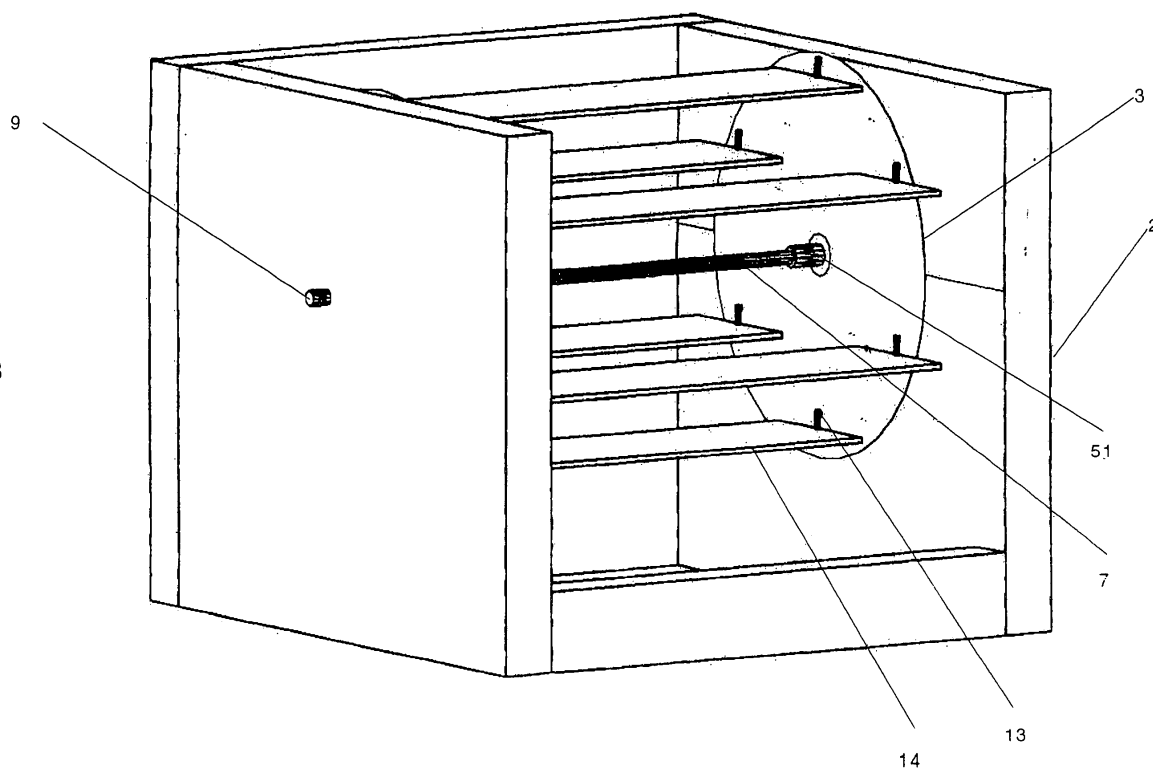
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(54) **Revolving display cabinets for refrigerated or heated counters**

(57) A revolving display cabinet (1) for refrigerated or heat counters comprising a first disk (3) and a symmetrically parallel and opposite second disc (4), said discs (3,4) being mounted on a rotatable horizontal axle

(7), a horizontal bearing surface (14) connected to and between said discs (3,4) through connection ports (13) allowing an oscillatory movement of the bearing surface (14) to remain horizontal.

Fig. 3



Description

[0001] The following invention refers to a revolving display cabinet for refrigerated or heated counters.

[0002] This invention may apply particularly, though not exclusively, to the manufacturing sector of display cabinets, showcases and refrigerated and/or heated counters as well as to the shop fitting industry of food products.

Field of application

[0003] Fixed and revolving display cabinets are available for showcases and/or refrigerated and/or heated counters specially designed for displaying food products. In the retail sector, particularly for the sale of not pre-packed products, there is the constant need to provide solutions with respect to display cabinets to ensure that the products on sale are visible to potential customers. And, at the same time, to facilitate easy access to the products for the retailers. The preservation of certain kinds of food, in particular food that needs to be kept and/or served at pre-set temperatures, that may be at times higher or lower than the room temperature, implies that it is necessary to provide cabinets fitted with refrigerating and/or heating devices.

[0004] Particularly in the field of refrigerated display cabinets for the sale of ice-cream cakes and ice-cream, a common solution consists of display refrigerators supplied with conventional refrigerating units along with a shelf where products on sale can be displayed. Usually, it is expected that the above-mentioned shelf can be inclined at different angles, for example, when ice-cream is served and sold unpacked, the shelf is expected to house ice-cream containers that are arranged next to one another in parallel rows. In order to preserve the product at the required temperature, to display it to the consumers, as well as to allow access to the retailer, the display refrigerator must be covered with a glass pane and have rear opening doors.

[0005] In order to meet further selling requirements, companies in this sector have been required to find solutions to make the products more visible in the display counters and, at the same time, to increase the quantity of products on display. In order to satisfy the latter requirement (increasing the capacity), some companies in this sector have used the solution of fitting display counters with various fixed shelves one over the other. Other companies have used the solution of mobile, namely, revolving shelves.

State of the art

[0006] Among the display cabinets solutions that can be found in the literature concerning patents, is the FR2624712 (Theis). It features a revolving display cabinet, which can be programmed. It comprises external glass panes fitted with a base and a cover fitted with

lighting, and some shelves, one over the other, used for the display of goods, that are connected to a vertical axle operated by a motor. The display cabinet is supplied with a polychromatic lighting device, which includes at least one sensor which is able to detect an object as it approaches, and change the light into white light. In addition, the display cabinet is provided with a digital key, electronically operated, that is able to stop the shelves revolving movement when an observer approaches the display cabinet, so as to allow the observer to see the product more clearly.

[0007] A second solution is the EP1197173 (Eurograf) that provides the description of a revolving display unit. Briefly, the display unit consists of a revolving axle where at one of its ends, a reduction unit perfectly fits with the axle base, and it is held in position by means of an upper and lower locking device. Above the reduction unit there is a support for a bearing locked by a driving flange fastened with screws. The feeding unit comprises a low voltage transformer provided with at least a fuse and a micro-switch to turn on the lighting device. Finally, a mobile cylindrical body is fitted parallel to the revolving axle, as it is supported by it, whereby further supporting bodies, that can be stacked, are also fitted parallel to the revolving axle, as they are designed to hold disc-like shaped shelves.

[0008] Another popular solution in the market, sold by the company ITALBOY srl, consists of a refrigerated display cabinet equipped with a revolving display unit with horizontal shelves. Briefly, the solution provides that a refrigerated glass display cabinet is fitted with internal horizontal display shelves to hold food. The shelves are connected to a pair of disc supports at their ends which are, in their turn, secured to a cam kinematic mechanism that, when an electric motor imparts a rotation movement, the interaction between discs and kinematic mechanism, allows the end of each shelf to keep a horizontal position that is parallel to the ground despite the rotation movement.

Disadvantages

[0009] All the current solutions concerning display units feature disadvantages and/or limitations to different extents.

[0010] Firstly, a common limitation to all types of display solutions for refrigerated and/or heated counters or glass cabinets, particularly in the case of display units with fixed shelves, is that the overall dimensions and the relative size of the units limit the quantity of product displayed. The higher the volumes of products to be displayed are, the larger the display unit must be.

[0011] According to purchasers' opinion, a second limitation of the common display structures of refrigerated and/or heated counters or glass display cabinets, even in the latest solutions which include multiple superimposed shelves or revolving shelves, concerns the difficulty in adapting the display requirements to the overall

size of the structure, namely, its strength, when displaying products of significant weights.

[0012] With respect to the structures of display units with revolving horizontal shelves, according to purchasers' requirements, a design limitation is that while the kinematic mechanism is in a central position, the shelves are only supported at their ends. This does not fulfil the need to support significant heavy weights. Furthermore, according to purchasers' opinion, the current solutions do not enable a set of ice-cream containers used for the retail sale of ice-cream to fit. In addition, the above-mentioned solutions do not allow the display unit structure to be supported directly by the display refrigerator or cabinet sides, which causes inconvenience to the current design structures.

[0013] Finally, another inconvenience according to purchasers' opinion, is due to the fact that the current display designs are not able to avoid thermal bridges between parts with different temperatures, especially between elements inside the structure that are connected to the outside.

[0014] Therefore, it is necessary that the companies within this sector research solutions for achieving the set objectives.

Aims

[0015] Through the creative contribution and technical progress, it has been possible to achieve the following aims and advantages.

[0016] Firstly, an advantage consists of manufacturing a revolving display unit for refrigerated or heated counters or display cabinets whose innovative structure allows the resolution of the current limited solutions by increasing the number of displayed products within the same counter length.

[0017] Secondly, another advantage is the manufacture of a revolving display unit whose innovative structure is suitable for arranging several ice-cream containers on multiple shelves within a structure, whose dimensions are remarkably smaller than those of the current known refrigerated counter or display cabinet structures, and at the same time, which makes the product easy to reach.

[0018] Thirdly, another advantage is the manufacture of a revolving display unit for refrigerated or heated counters or display cabinets whose innovative structure prevents any inconvenience caused by the creation of thermal bridges between areas with different temperatures.

[0019] Another advantage is the manufacture of a revolving display for refrigerated or heated counters or display cabinets whose innovative structure allows the reduction of preparation time and costs when equipping the display as compared to the current models available.

[0020] These and other advantages will be shown in the following detailed description of some preferred solutions and the enclosed schematic drawings whose construction details are intended only as examples.

Drawings contents

[0021]

5 Figure 1 is an overall view of the elevation of the revolving display unit, mounted on a display refrigerator structure, that refers to the content of the present invention.

10 Figure 2 is an axonometric view of the revolving display unit referring to the content of the present invention.

Figure 3 is a view of the revolving display unit, applied to the display refrigerator walls, referring to the content of the present invention.

15 Figure 4 is an axonometric view of the revolving display unit, with shelves consisting of container holding frames, referring to the content of the present invention.

20 Figure 5 is a cross-section of the revolving display unit, applied to the display refrigerator, referring to the content of the present invention.

Practical purposes of the invention

25 **[0022]** With reference to the above-mentioned figures, one can see a revolving display unit **1**, for refrigerated or heated display cabinets or counters, which is described as an example of the preferred solution. It is used to equip a common refrigerated or heated counter or glass display cabinet **2** (Fig. 1). The revolving display unit **1** is expected to comprise a first disc **3** and a second disc **4**; in the example, they are made preferably but not necessarily of sheet metal. Both the first disc **3** and the second disc **4** are expected to have the same diameter and the fulcrum in the centre.

30 **[0023]** When we analyse the described example in details, both the first disc **3** and the second disc **4** (see fig. 3) are fitted with a passing central lodgement **31**, **41**, for fitting respectively a first hub **5** and a second hub **6** identically shaped and comprising a hollow shaft **51**, **61**, and a flange **52**, **62**. By means of standard fastening methods, regardless of whether riveting and/or bolting and/or screwing, the flange **52** on the first hub **5** engages the first disc **3** and the flange **62** on the second hub **6** engages the second disc **4**.

35 **[0024]** The ends of the axle **7**, in the example, are preferably in metal, and designed to be fitted respectively into the hollow shaft **51**, **61** of the first hub **5** and the second hub **6**. More precisely, an end of the axle **7** is fastened, namely bolted, to the hollow shaft **51** of the first hub **5**, whereas the opposite end of the axle **7** is fastened, namely bolted, to the hollow shaft **61** of the second hub **6**, so that the first disc **3** is symmetrically parallel and opposite to the second disc **4**, since they are both orthogonal and connected to the axle

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[0025] Moreover, in order to enable and impart a rotation movement by means of standard traction devices, hand or motor-driven, by way of example, a standard reducing unit with or without inverter, the hollow shaft **51** on the first hub **5** is expected to engage a first hollow shaft **8**, since it is fitted into it, that is mounted opposite to the axle **7**, whereas the second hollow shaft **61** on the second hub **6** engages, since it is fitted into it, a second shaft **9** that is mounted opposite to the axle **7**.

[0026] More precisely, it is expected that the first shaft **8** is fastened to a first support **10**, since it is sustained by friction reducing units, for example, anti-friction bearings **11** whereby the first support **10**, which is expected to be made in low thermal conductive material such as nylon, is preferably of a single-piece type. Also the second shaft **9** is expected to be fastened to a second support **12**, as it is sustained by friction reducing units, for example, anti-friction bearings **11** whereby also the second support **12**, which is expected to be made in low thermal conductive material such as nylon, is in a single piece. Both the first support **10** as well as the second support **12**, in the example, are fastened to the corresponding side wall of the refrigerated counter and/or display cabinet structure.

[0027] Moreover, both the first shaft **8** and the second shaft **9** are made in low thermal conductive material, in this example, in nylon, so as to avoid the creation of a thermal bridge between areas with different temperatures. In order to enable the revolving display unit **1** to spin round in one direction or the other, in this example, the length of the second shaft **9** is such that part of the shaft protrudes from the second support **12**, so that the second shaft **9** can be connected to a manual or automatic transmission mechanism.

[0028] Both the first disc **3** and the second disc **4** are equipped with a set of lodgements **32, 42**, in the example, consisting of passing holes, that are arranged in a circle preferably at the same distance from one another. More precisely, both the lodgement **32** of the first disc **3** and the lodgement **42** of the second disc **4** are reciprocally aligned so that one lodgement **32** of the first disc **3** is aligned to and corresponds to one lodgement **42** on the second disc **4**.

[0029] In each lodgement **32, 42** of the first disc **3** and of the second disc **4** it is expected to have the protruding end **131** of a shaped connection **13**, which fastens the side end of a horizontal bearing surface **14**, between the first disc **3** and the second disc **4**, so that the bearing surface **14** results at a lower level than the protruding end **131** of the connection **13** and, correspondingly, the lodgements **32, 42** of the first disc **3** and of the second disc **4**. Thus, since the protruding end **131** of each connection **13** is not secured inside the corresponding lodgement **32, 42** of the first disc **3** and of the second disc **4**, when the rotation movement occurs the bearing surface **14** will constantly keep its horizontal position parallel to the ground, since the bearing surface is allowed to carry

out an oscillatory movement.

[0030] More precisely, in this example, each connection **13** is shaped so that it features a protruding horizontal end and an opposite horizontal sustaining part. Both the protruding end **13** and the sustaining part are at the ends of a vertical part **132** of a pre-determined length. In the example, each bearing surface **14** has a rectangular shape, even though it could have a different shape.

[0031] An alternative version to the invention is that the bearing surface **14** is made up of a frame, in the example, in tubular metal, where standard containers are kept, since the above-stated frame is shaped so that it can act as a support for the containers **15**. More precisely, the frame-shaped top is rectangular with a central opening **141** where containers **15** can be fitted in, in the example, ice-cream containers. The containers upper edge **151** is supported by the upper part of the frame-shaped top. An alternative solution is that in the lodgements **32, 42** of the first disc **3** and of the second disc **4** there is a protruding pin which supports the upper end of the connection **13** that is shaped as a hook, or eyelet, or equipped with a passing hole or a dead hole.

Legend

[0032]

- 1** revolving display unit;
- 2** refrigerated counter and/or glass display unit;
- 3** first disc; **31** central lodgement; **32** lodgements;
- 4** second disc; **41** central lodgement; **42** lodgements;
- 5** first hub; **51** hollow shaft; **52** flange;
- 6** second hub; **61** hollow shaft; **62** flange;
- 7** axle;
- 8** first shaft;
- 9** second shaft;
- 10** first support;
- 11** anti-friction bearings;
- 12** second support;
- 13** connection; **131** protruding end; **132** vertical part;
- 14** bearing surface; **141** central opening;
- 15** containers; **151** upper edge.

Claims

1. The revolving display cabinet **1** for refrigerated or heated counters basically **features** the disc **3, 4** which is connected to the bearing surface **14** - between disc **3** and **4** - through the connection **13** that allows an oscillatory movement, as this part matching the disc **3, 4**, is located above the bearing surface **14**.
2. According to the above-mentioned claim, the revolving display cabinet **1** basically **features** the first disc **3** and the second disc **4** that are connected by means of the axle **7**.

3. According to the above-mentioned claims, the revolving display cabinet **1** **features** the disc **3** and **4** each provided with the lodgements **32, 42** located at the same distance. 5
4. According to the above-mentioned claims, the revolving display unit **1** **features** the disc **3** and **4** each provided with the hub **5, 6** comprising of the hollow shaft **51, 61** and the flange **52, 62** whose hub **5, 6** engages the shaft **8, 9** made in low thermal conductive material. 10
5. According to the above-mentioned claims, the revolving display cabinet **1** **features** the shaft **8, 9** that is fastened to the support **10, 12** made in low thermal conductive material. 15
6. According to the above-mentioned claims, the revolving display cabinet **1** **features** the connection **13** which has an upper end **131** and a lower end. The upper protruding end **131** of the convection **13** results at the same level of the centre of the corresponding side of the bearing surface **14** where it fits in. 20
7. According to the above-mentioned claims, the revolving display cabinet **1** **features** the bearing surface **14** made up of a tubular metal frame that supports standard containers **15**. 25

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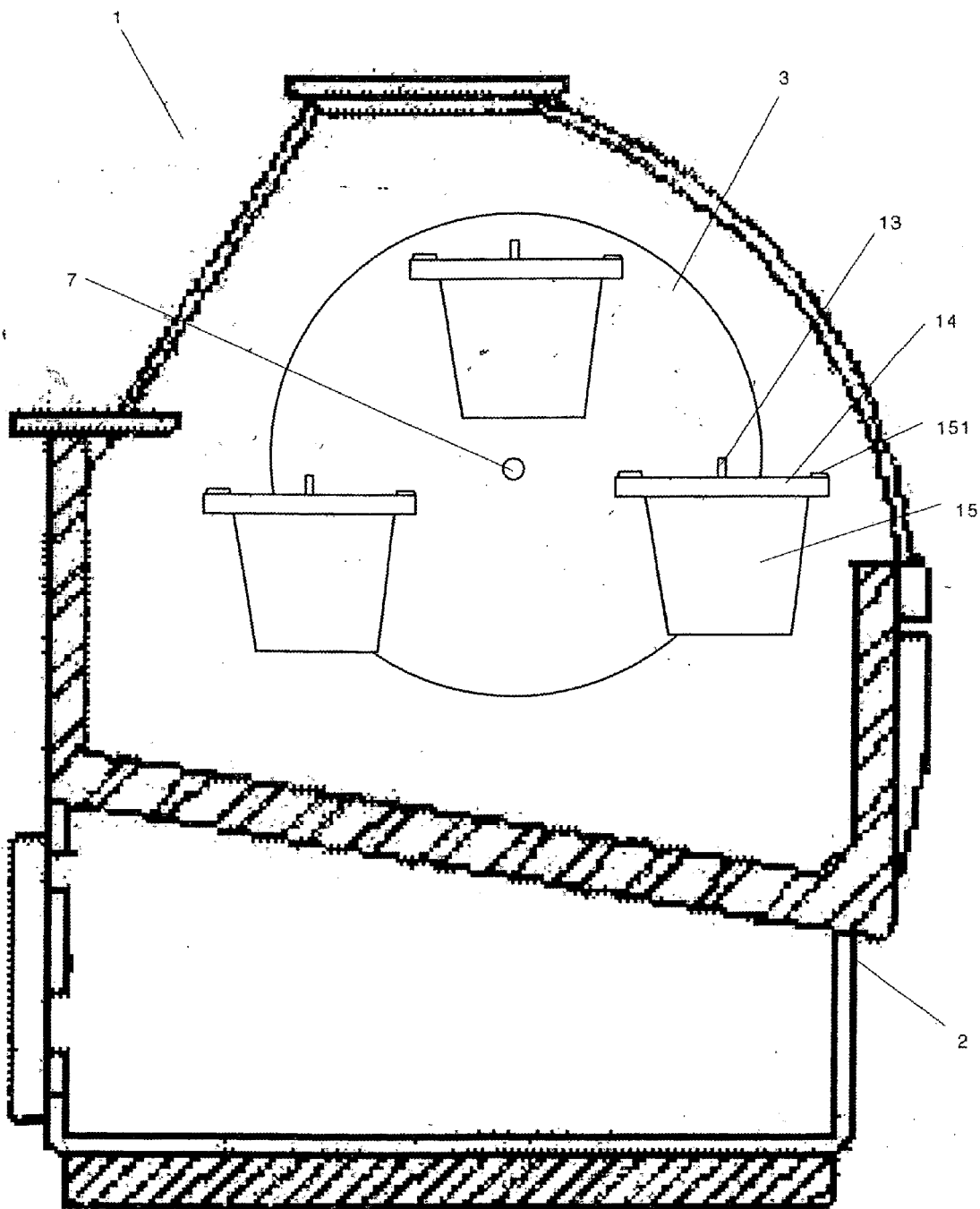


Fig. 1

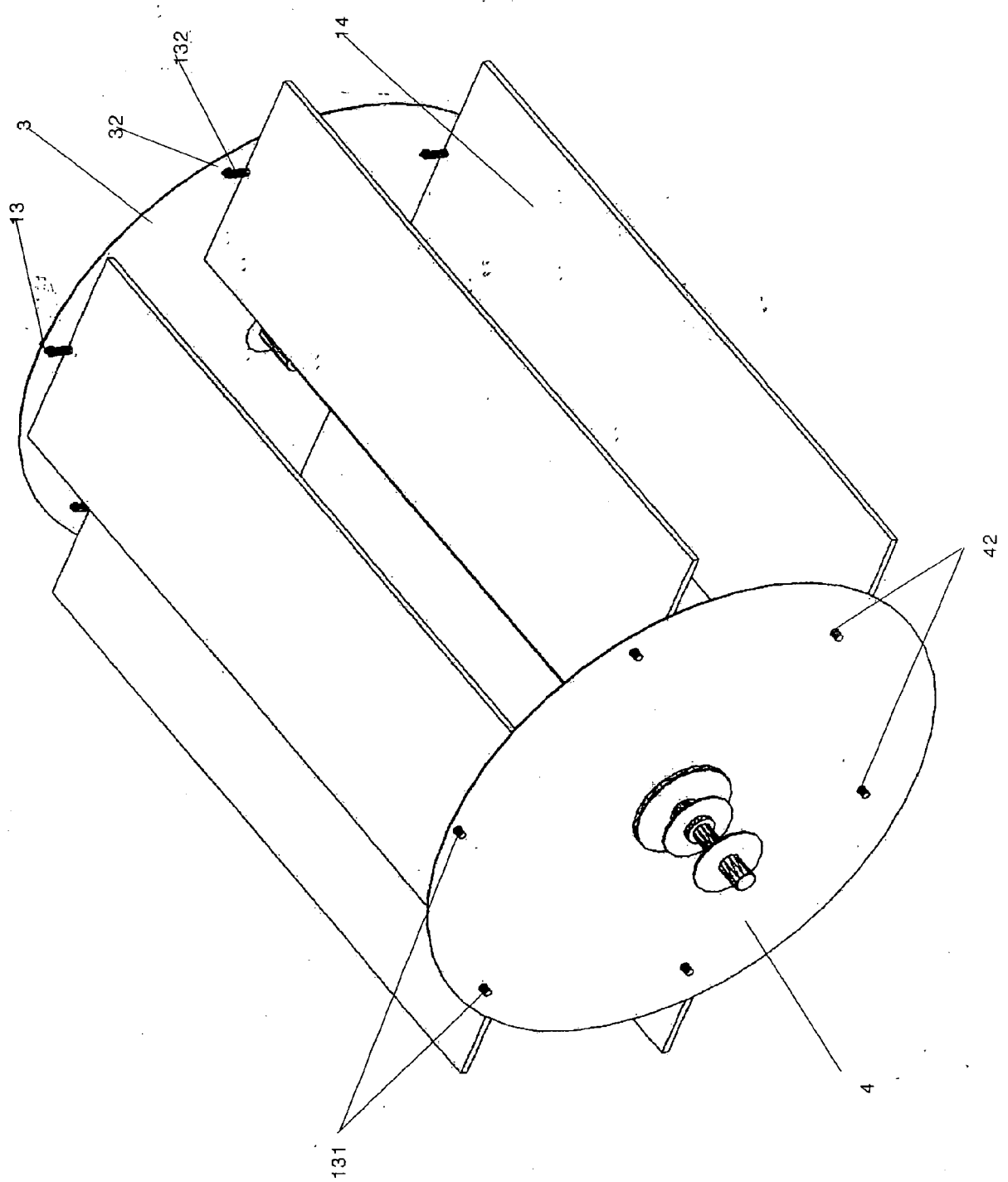


Fig. 2

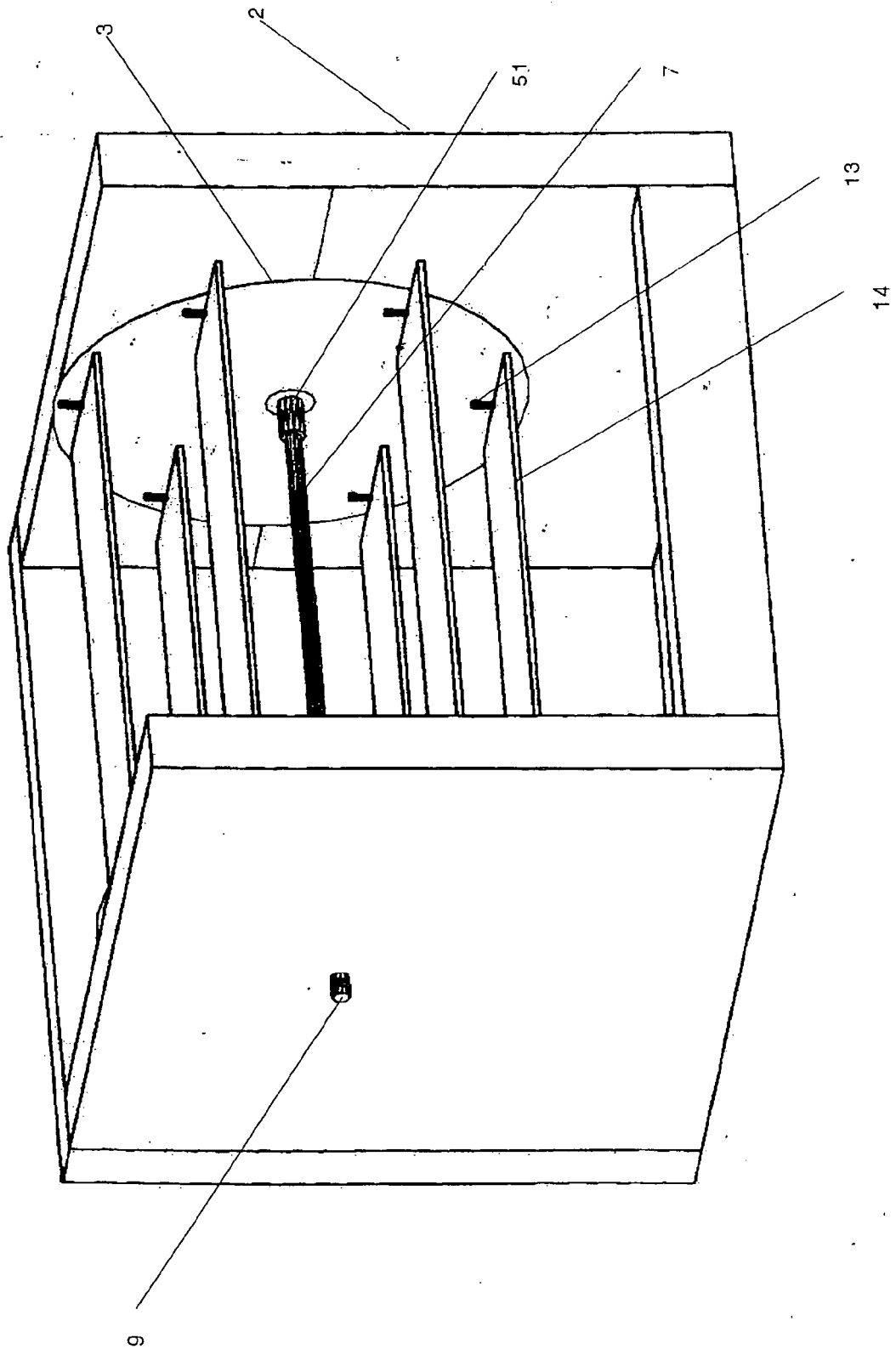


Fig. 3

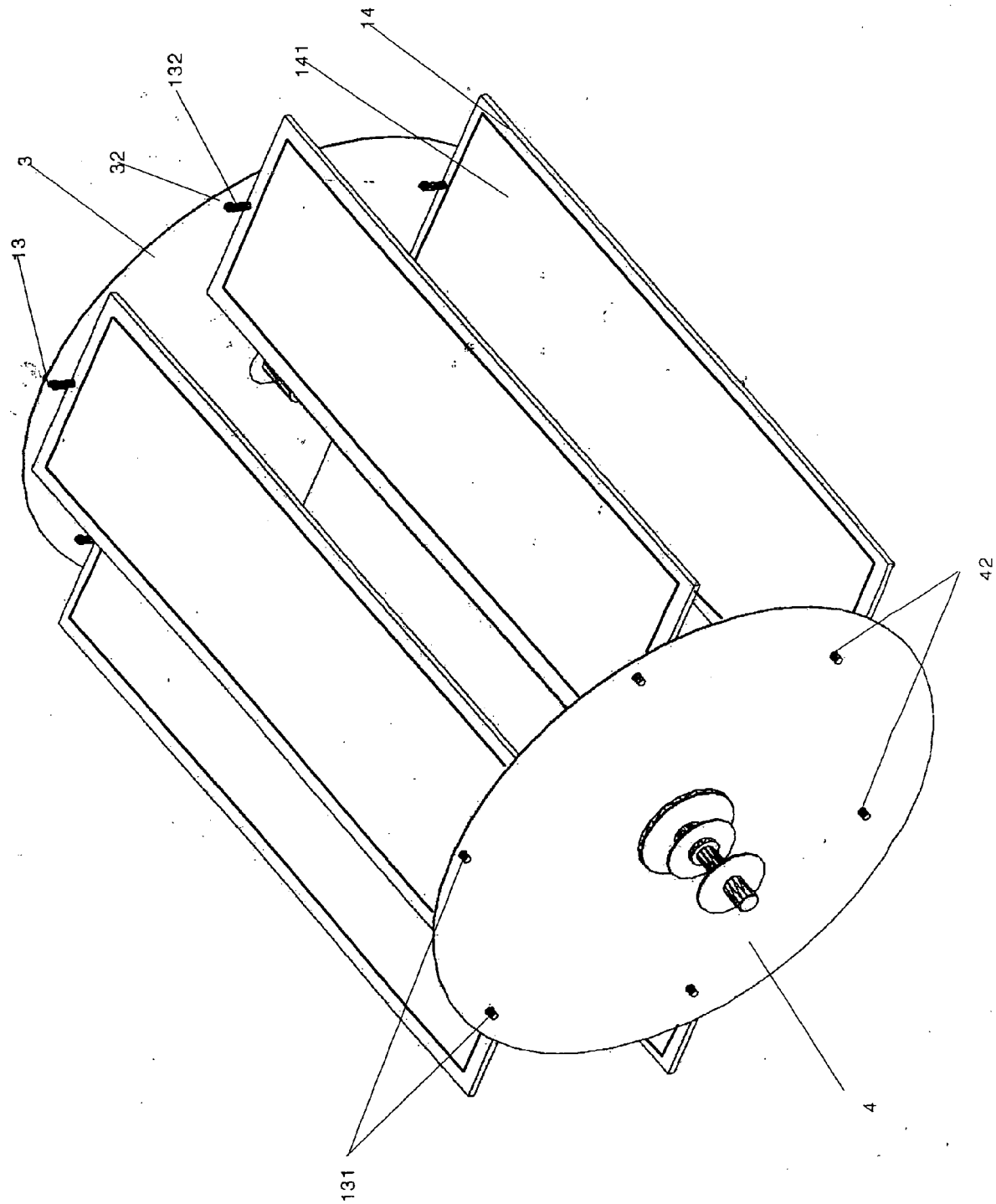


Fig. 4

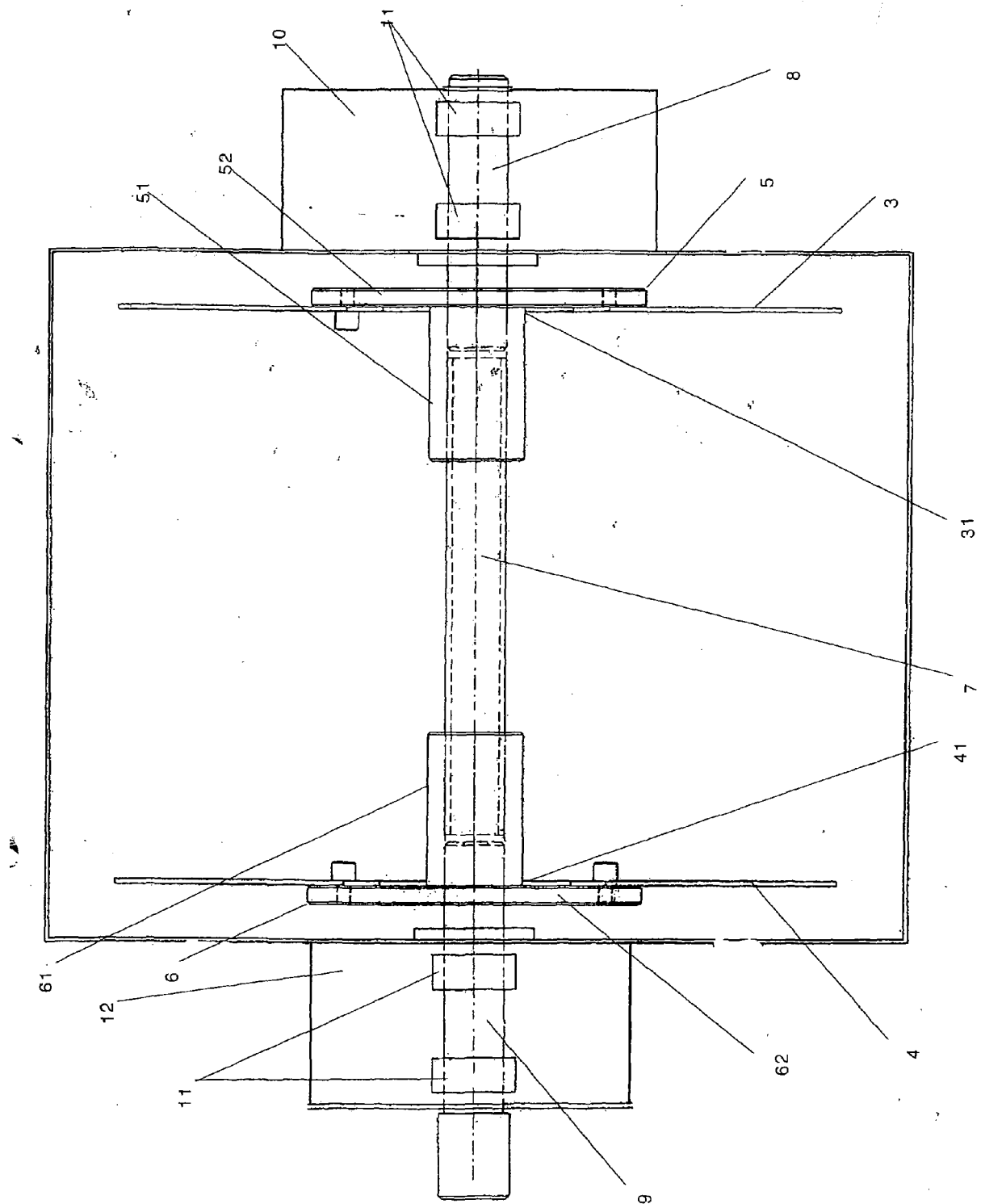


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 08 01 3517

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	GB 2 331 513 A (U SELECT IT) 26 May 1999 (1999-05-26)	1-3	INV. A47F3/08
A	* page 6, line 14 - line 15; claim 1; figures 1,4 * * page 7, line 13 - line 14 * * page 8, line 16 - line 18 * * page 9, line 4 - line 6 *	4,6	
X	GB 2 366 187 A (STAPLES ET AL) 6 March 2002 (2002-03-06)	1-3	
A	* page 1, line 12 - line 13; claim 1; figures 1,3 * * page 4, line 11 - line 27 * * page 2, line 18 - line 22 *	5	A47F A47B A47J
A	US 3 379 119 A (HARRILL) 23 April 1968 (1968-04-23) * the whole document *	1-5,7	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 November 2008	Examiner Jacquemin, Martin
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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EPO FORM 1503 03.82 (P04C01)

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

EP 08 01 3517

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The members are as contained in the European Patent Office EDP file on
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11-11-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2331513 A	26-05-1999	EP 0919963 A2	02-06-1999
		US 6241119 B1	05-06-2001
GB 2366187 A	06-03-2002	NONE	
US 3379119 A	23-04-1968	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- FR 2624712 [0006]
- EP 1197173 A [0007]