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(54) **Cover provided with valve for closing vacuum food containers**

(57) The present invention relates to a cover (2) for closing vacuum food containers (1), with a seating (4), provided on the bottom with a hole (9), which leaves the air pass through it, where a disc (18) is fitted into, in which an elastic tongue (10) is cut out supporting a shutter (11) suitable to close and open said hole (9). A body (12), fitted into said seating, which can only rotate, is provided with cam means (16), which engage said tongue (10) and which, as a result of the rotation of said body (12), move from a position which lock the tongue (10) with the shutter (11), to a position in which they enable the free oscillation, to a position in which they pull the tongue (10) and the shutter (11) in order to enable the air to freely pass through it.
The cover (2) according to the present invention can be made by plastic moulding, is composed of a few parts and, accordingly, can be manufactured at extremely reasonable cost.

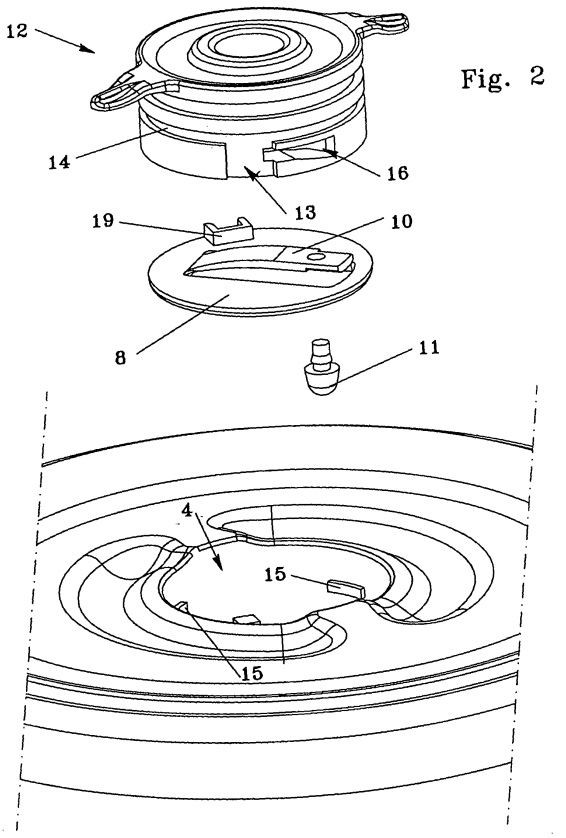

Fig. 2

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Description

[0001] The present invention refers to a cover for closing vacuum food containers, of the type provided with an improved valve, which is easy to manufacture and user-friendly, to be connected to a suction device capable of creating a vacuum inside the container.

[0002] More particularly, the cover according to the present invention consists of a seating, provided on the bottom with a hole, for air passage, wherein a disc is fitted, in which an elastic tongue is cut out supporting a shutter suitable to close and open said hole. A body, fitted into said seating, which can only rotate, is provided with cam means, which engage said tongue and which, as a result of the rotation of said body, move from a position for locking the tongue with the shutter, to a position in which they enable the free oscillation, to a position in which they raise the tongue and the shutter in order to enable the free air passage.

[0003] The cover according to the present invention can be made by plastic moulding, is composed of a few parts and, accordingly, can be manufactured at extremely reasonable cost.

[0004] Containers, used in particular to preserve foodstuff, closed by a sealed cover provided with elements to be connected to a suction device capable of creating a vacuum inside the container, with a view to guarantee the preservation of foods, are known.

[0005] Said containers, whose diffusion noticeably increased in the last years, often consist of a closed basin or canister, where a seal is fitted in between, a cover provided with a valve element, which is in turn fitted with a joint which enable it to connect to the suction device.

[0006] In the simplest systems, said valve consists of a simple diaphragm valve having flexible sheets, which close a hole in the valve wall.

[0007] When suctioning, most of the pressure inside the container raises the valve thus leaving the air to leak out; at the end of the suction phase, the higher atmospheric pressure presses the sheet against the hole, which, accordingly, remains closed.

[0008] This is an extremely simple system but not as much effective, and is not recommended in case of need to preserve the food for more than a few hours.

[0009] The Italian utility model N№ 236,641 of the same inventor, teaches a seal valve for vacuum containers, wherein a shutter is solidly connected with a pin slidably fitted on a supporting body, which is inserted into a seating, fitted in the cover, provided with an opening on the bottom.

[0010] The short sliding movements allowed to the pin, enable the shutter to move from a raised position, with the hole open, to a lowered position, with the hole closed.

[0011] The supporting body is provided, on the outside, with a screw-thread, which enable the body to rotate and move to a raised position, in which it keeps the pin and the shutter far from the hole, which hole remains always open, to an intermediate position in which the shutter can move from a closing or an opening position of the hole, to a completely lowered position in which it presses the shutter against the lower wall, thus keeping the hole always closed.

[0012] The present solution turned out to be effective but rather complicated, in view of the fact that it consists of several pieces having also complex shapes; this circumstance increases the production cost and the time required to assemble the device.

[0013] The present invention falls into this sector, by proposing a cover for closing vacuum food containers, provided with an improved valve, composed of very few parts, which can be manufactured at reasonable cost, easy to assemble and to use.

[0014] This and other aims can be achieved by a cover provided with a valve according to the characterizing part of the claims annexed hereto.

[0015] This invention will be now described in detail, by way of example and without any limitation thereto, with reference to the figures annexed thereto, in which:

- figure 1 shows, as exploded view, a food container with a cover provided with a valve according to the invention;
- figure 2 shows a magnified particular of figure 1;
- figures 3 shows, in section along line C-C of figure 4, a cover according to the invention, applied to a container;
- figures 3A and 3B show magnified particulars of figure 3, which show in section a valve in closing and opening position, respectively;
- figure 4 is a top view of the cover according to the invention;
- figures 5 and 6 are sections of the cover with the valve along lines A-A and B-B, respectively, of figure 4.

[0016] With reference to figure 1, reference number 1 indicates a container for food, which is closed by a cover 2 which leans against an edge with a seal 3 in between shown in figure 3.

[0017] The central area of the cover is provided with a seating 4, which lodges a valve indicated as a whole with reference number 5 and which is provided with a seating 6 to fit a push rod into, connected to a known suction device.

[0018] The structure of the valve element is better visible in figure 3.

[0019] The seating 4 is provided with a side wall having a substantially cylindrical shape indicated with reference number 7 and a lower wall 8 having a hole 9 to leave the air pass from the container to the outside and vice versa.

[0020] In the seating 4 a disc 18 is inserted, leaning against the lower wall and provided with a raised tooth 19.

[0021] In the disc 18, made for example of plastic, a sheet 10 is cut into, which sheet is fixed to a shutter 11 suitable to close the hole 9 on the lower wall of the seating 4.

[0022] A tooth, not shown in the figure, which fits into a corresponding groove in the wall of the seating 4, enables to guarantee a correct position of the disc 8, in order that the shutter 11 is positioned just close the hole 9, and to avoid any rotation of the disc inside the seating 18.

[0023] The valve is completed with a cylindrical body 12 (fig. 2), closed on its upper part by a wall which is provided with the joint 6 for the push rod of the suction device and which is fitted, on the external vertical wall, with one or more cavities 13, which give access to an annular groove 14, where projecting teeth 15 are fitted into, provided on the internal wall of the seating 4.

[0024] The engagement among these teeth and the groove thereof 14 enables the cylindrical body 12 to rotate but not to travel inside the seating.

[0025] Inside, on the wall 15 of the annular body 12 a cam element indicated with 16 is placed.

[0026] The cam-shaped element 16 has three consecutive portions: in a first portion it engages the end of the sheet 10 from the bottom, keeping it raised and, accordingly, keeping the shutter in the opening position of the hole 9.

[0027] In the intermediate hole, the cam-shaped element does not engage the sheet 10, which is therefore free to oscillate, thus enabling the shutter 11 to raise or come down, depending on whether the air is sucked from the inside of the shutter or the external pressure maintains it closed.

[0028] In the third position, shown by figure 3A, the cam-shaped element engages from above the sheet 10, keeping it pressed against the bottom and locking the shutter 11 in the closing position of the hole 9.

[0029] The width of rotation of the body 12 depends on setting elements, which can consist, for example, of teeth on the lower edge or of an extension for a certain portion of the same wall of the body 12, which engages the setting tooth 19 on the disc 8.

[0030] The assembling and the use of the device are extremely simple.

[0031] As regards the assembling, once the shutter 11 has been fitted to the sheet 10, it is only required to fit the disc 18 into the seating 4, with the projecting teeth of the disc, which fit into the corresponding grooves on the wall 7, in order to guarantee the correct position of the disc and the shutter 11.

[0032] The body 12 is then mounted, by fitting it into the seating 4 with the teeth 15 passing through the cavities 13 in the side wall.

[0033] Once the body is pressed on the bottom, the body 12 is rotated with the teeth 15 which, by acting together with the annular groove 14, prevent the body 12 from travelling, thus enabling only the free rotation thereof.

[0034] At this point, the device is ready for use.

[0035] The cover is leaned against the edge of the cover with a proper soft seal fitted in between and the body 12 is rotated until the tongue 10, which engages the cam-shaped element 16, is moved just close the intermediate position of said element, in which position the tongue is free to oscillate.

[0036] It is now only required to connect the push rod of the suction device to the seating 6 of the valve and actuate the device.

[0037] The air, from the inside of the container 1, will pass through the hole 9 and will be sucked from the device connected to the joint 6.

[0038] Once the suction is terminated, the internal atmospheric pressure, which is higher than the one inside the container, will press the sheet 10 down, thus making the shutter 11 to close the hole 9.

[0039] At this time, it is only required to complete the rotation of the body 12 to make the upper part of the cam-shaped element 16 to engage the tongue 10 and to lock it in the closing position of the shutter 11, with the confidence that the vacuum inside the container will be kept also for a long time.

[0040] In order to restore the pressure conditions inside the container and enable the removal of the cover, it is only required to make a complete rotation of the body 12 in the opposite direction, until the lower cam-shaped element 16 engages from the bottom the sheet 10 and raises it, keeping the shutter in the opening position.

[0041] As it can be clearly understood by the description above, the cover with valve according to the present invention offers several advantages as compared to the known covers:

- it consists of an extremely reduced number of elements;
- it is extremely easy to assemble, since it is only required, firstly, to fit the disc 18 and then the body 12 into the respective seating, while rotating the body to position the teeth 15 to the annular groove 14;
- it is extremely easy to use, since it is only required to rotate it in the three positions as showed in figure 4, to move the valve from the opening position to the suction position to the closing position and vice versa.

[0042] Of course, the size, as well as the materials used, may be changed according to the user's requirements.

Claims

1. Cover with valve for closing vacuum food containers, of the type provided with an opening for sucking the air inside the container, closed by a valve, which can be coupled to a suction device, **characterised in that** it provides for the following:

   - a seating, in said cover, with an opening on the bottom for leaving the air pass through;
   - a shutter suitable to close and open said open-

ing, fitted on an elastic support suitable to enable the opening and closing movements;
- means suitable to engage said support, which can be moved from a first position in which they lock said shutter in a closing position, to an intermediate position in which they disengage said shutter enabling the free movements and to a third position in which they engage said shutter to keep it in an opening position.

2. Cover according to claim 1, **characterised in that** it provides for the following:

- a substantially cylindrical seating in said cover which is provided on the bottom with a hole to leave the air pass through;
- a disc fitted in the said seating and locked in rotation, in which an elastic tongue is cut out;
- a shutter, fitted to said tongue, suitable to open and close said hole;
- a cylindrical body, fitted in said seating which can only rotate, in which a cam-shaped element is fitted, which engages the free end of said tongue, said cam-shaped element, after the rotation of said cylindrical body, moving from a position in which it engages on the upper part said tongue locking it in a closing position of the hole, to an intermediate position in which it disengages said tongue, thus enabling free movements of the shutter, to a third position in which it engages on the bottom said tongue, locking it in an opening position of the hole.

3. Cover according to claim 2, wherein said disc is provided with projecting elements made in such a way as to fit into corresponding cavities in the wall of said seating to lock the disc rotating, and in which said cylindrical body is provided with an annular groove in which projecting teeth fit into, solidly connected with said body, thus preventing them from shifting.

4. Cover according to any one of the preceding claims, wherein limit relief elements are provided, in order to limit the width of rotation of said cylindrical body between the two extreme engagement positions between said cam-shaped element and said tongue.

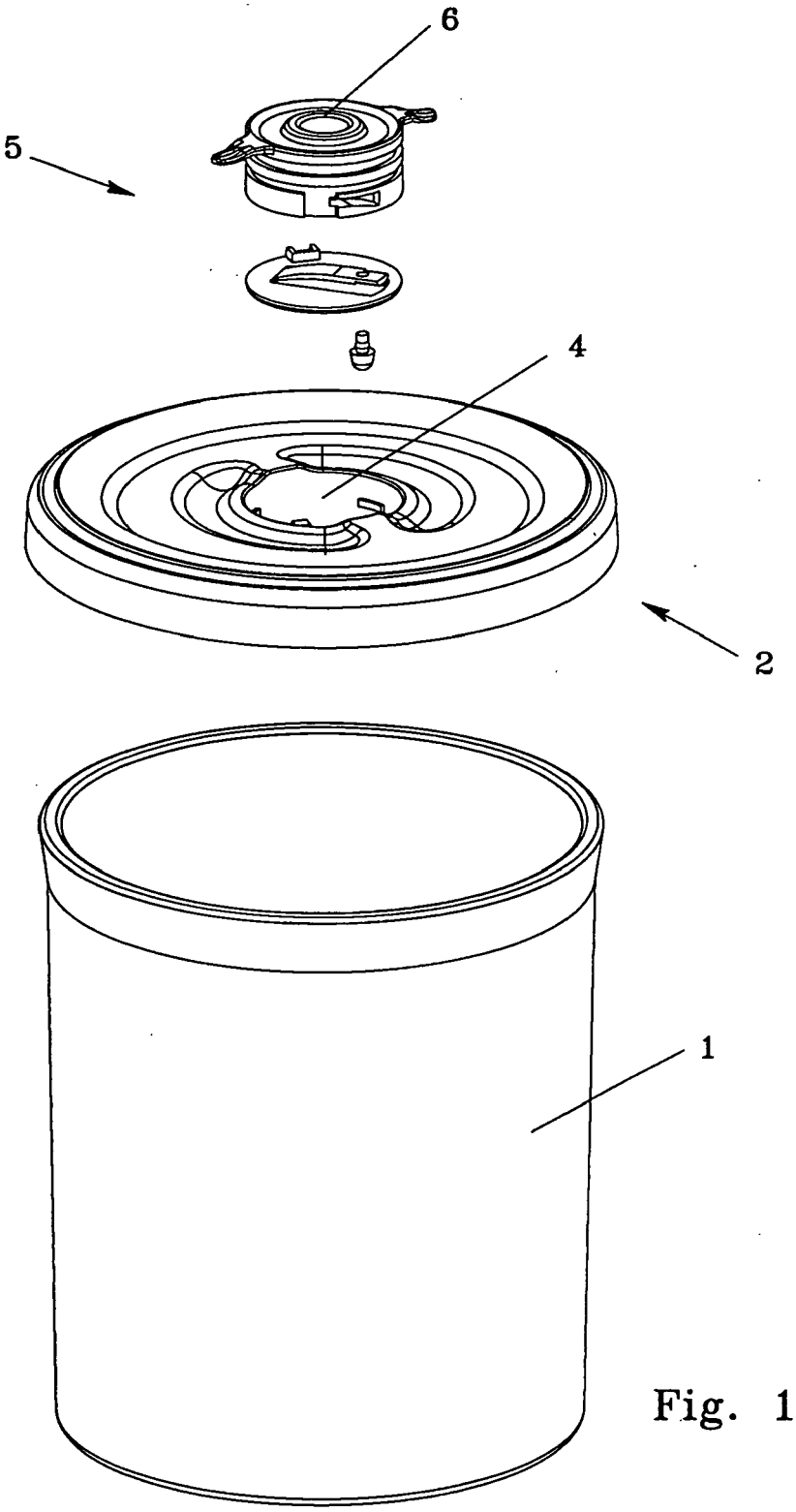


Fig. 1

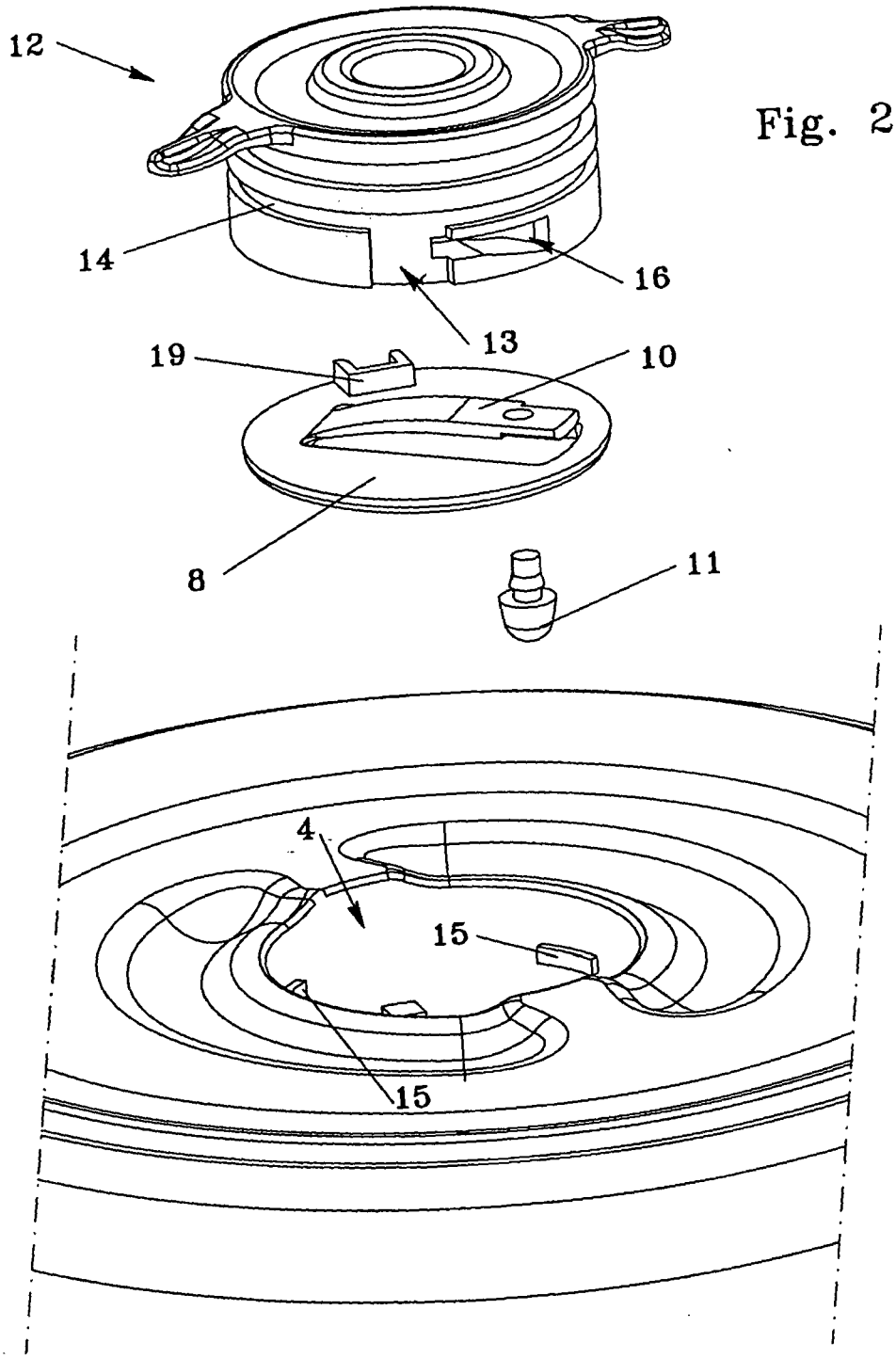
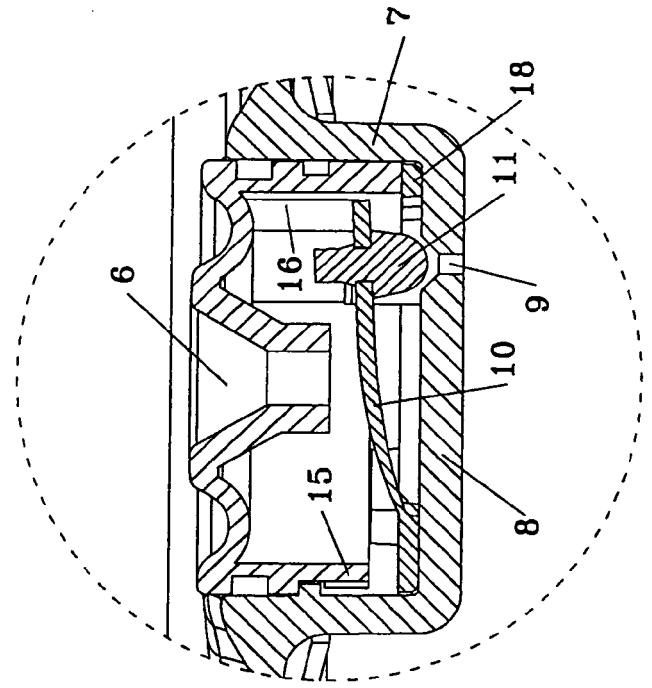
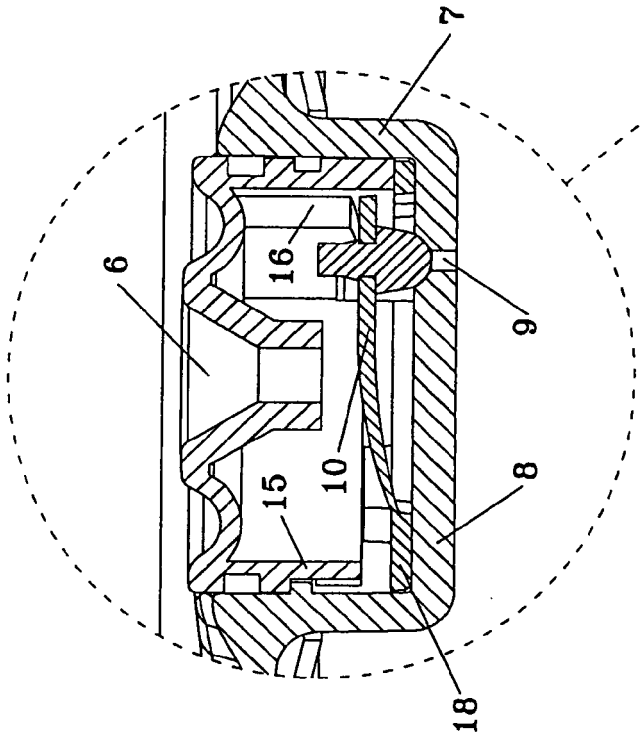


Fig. 2



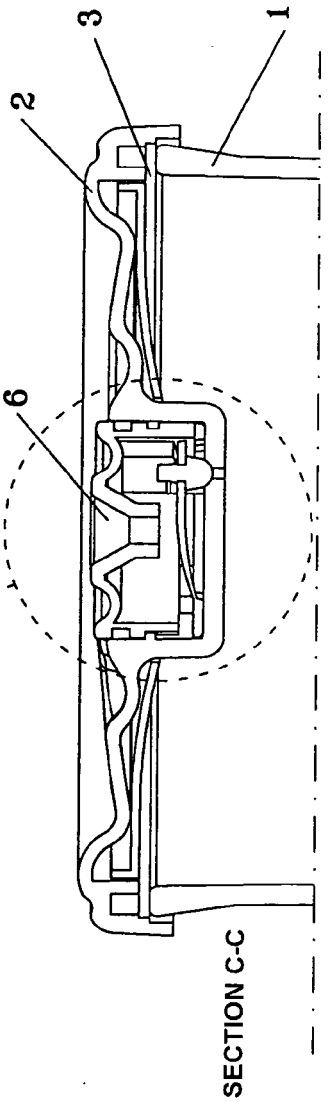
OPEN VALVE

Fig. 3b



CLOSED VALVE

Fig. 3a



SECTION C-C

Fig. 3

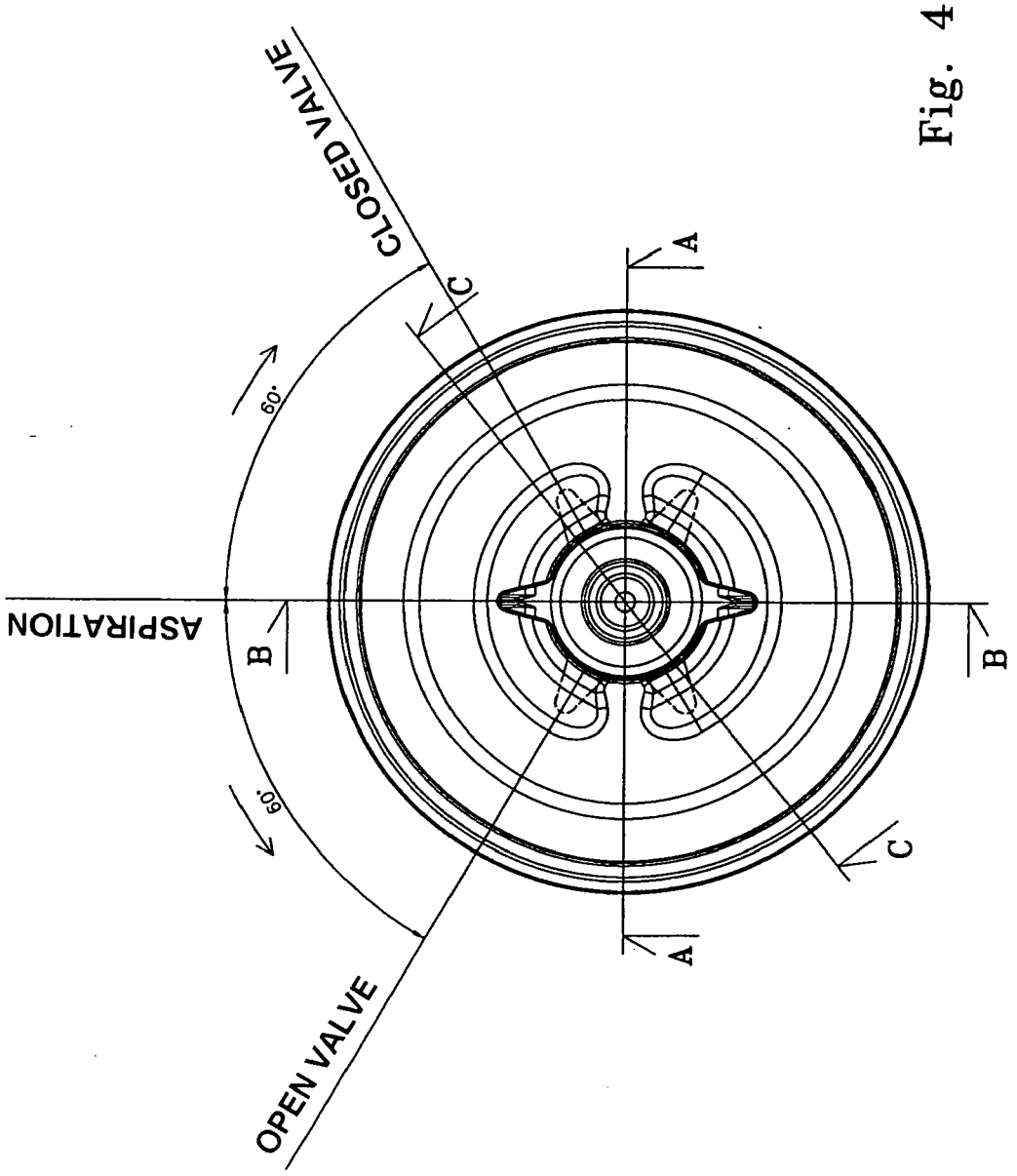


Fig. 4

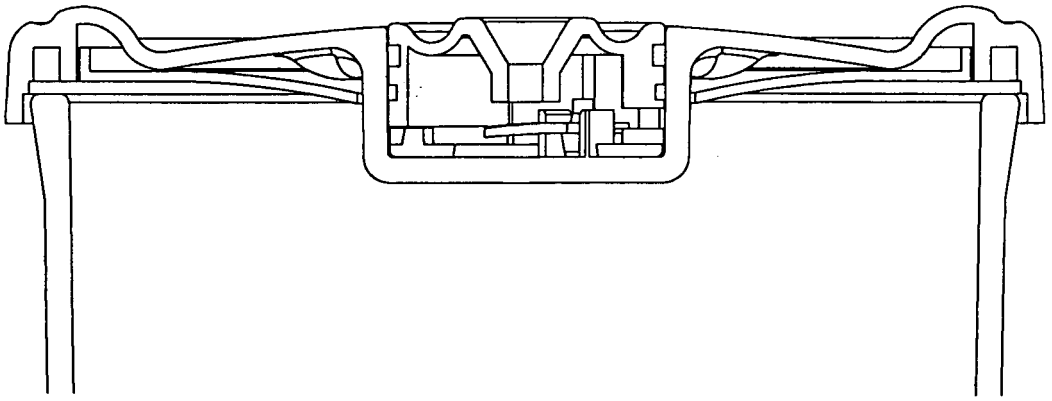


Fig. 5

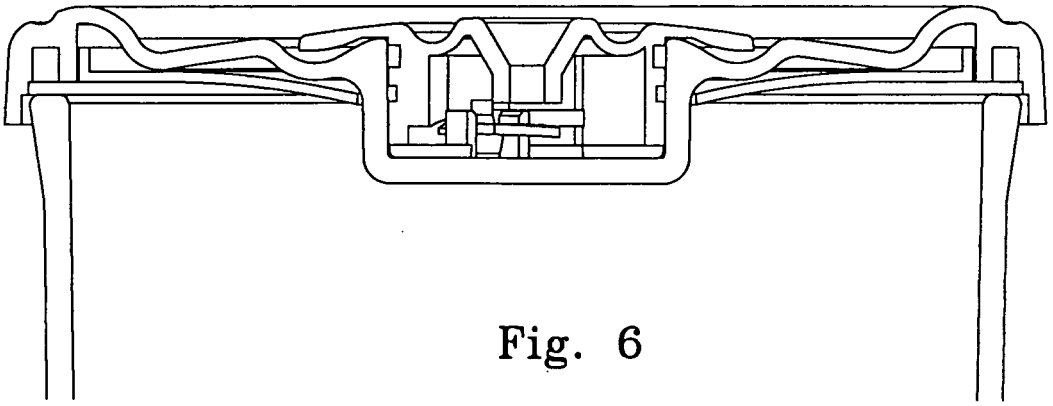


Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 00 6811

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 August 2007	De Terlizzi, Marino

CATEGORY OF CITED DOCUMENTS

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