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(54) **APPARATUS FOR COOLING GLASSES AND CONTAINERS, IN THE FORM OF AN AUTOMATICALLY ACTUATED REMOVABLE COMPACT KIT**

(57) AN APPLIANCE FOR COOLING GLASSES AND RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, comprised of a main box (2) with a protective cover (3), to the outside of which the following elements are connected: the hood (5) and spraying unit (24), a hardware connector (33) for entering the appropriate parameters and programmes in the microprocessor and a protective support (19) which includes a safety connector body (20) for coupling to the tube from the CO₂ cylinder, all forming a compact, extractable kit fitted with methods for the automatic operation thereof and regulating its height by means of fibre-optic viewers (38) and safety devices for stopping it automatically, using infrared sensors (39).

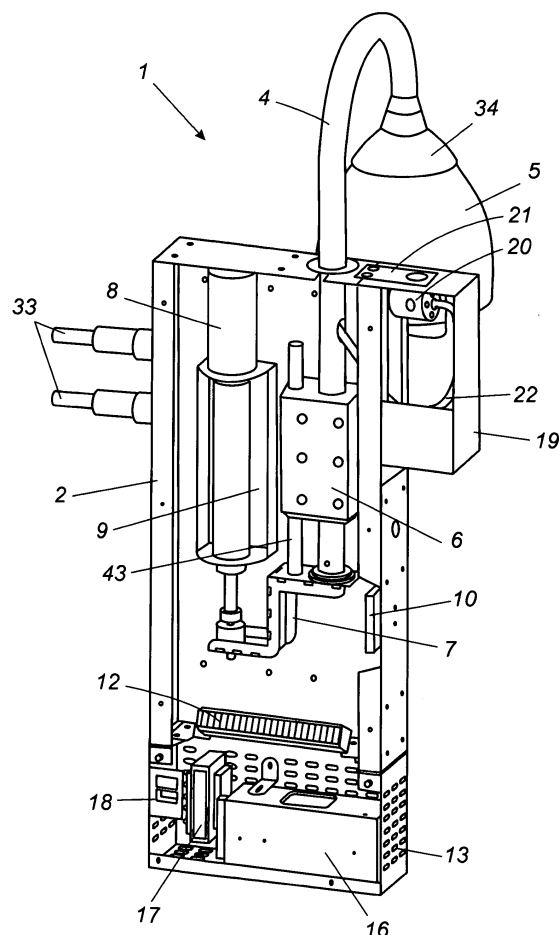


Fig. 1

Description

OBJECT OF THE INVENTION

[0001] As stated in this descriptive record, the invention refers to an appliance for cooling glasses and receptacles built into a compact extractable kit that can be operated automatically. This appliance incorporates several advantages and innovative characteristics into the function for which it is used, as well as others that are intrinsic to its organisation and constitution. These characteristics will be described in detail later and entail a substantial improvement in appliances currently available in the market that are used for the same purpose.

[0002] In particular, the object of the invention is a cooling appliance, of the type used in hotels and restaurants for the rapid cooling of glasses or other receptacles at very low temperatures by spraying them with liquid (cryogenic) CO₂ which in particular, allows the glass or receptacle to be placed below the nozzle and the top part to be sprayed with gas, with the particularity of forming part of a compact kit that can easily and quickly be extracted and connected to the CO₂ cylinder and electronic device or hardware into which the appliance control parameters are entered. It also has an innovative electronic automatic operating device fitted with an infrared safety system.

SCOPE OF APPLICATION OF THE INVENTION

[0003] This invention is intended for use in technical industries dedicated to the manufacture of cooling or refrigerating appliances.

BACKGROUND OF THE INVENTION

[0004] As a reference to the state of the art, it should be said that other appliances for cooling glasses of the type mentioned here already exist. In particular, at least the ones described in the following patents are known: Spanish patents n° P200900858 and n° P200900745 and PCT Patent n° 2009/00313.

[0005] Thus, the first, an appliance for cooling glasses, includes a spraying unit with an electro valve connected to a lead through which the gas from the CO₂ cylinder enters. That electro valve is connected to a programmable electronic board and has a flow adjusting device and a spray nozzle. The gas emerges through the holes of the latter and reaches the interior of the glasses to be cooled, which are placed on stands provided for that purpose in the casing which houses the entire unit.

[0006] In turn, the second patent, related to an improved appliance for cooling glasses or other receptacles and also based on the application of cryogenic liquid CO₂ through a spraying system similar to the nozzle with orifices, is different in that it also has a base to which a hollow tubular support is coupled. The spraying unit is connected to one end of it, facing downwards so that the

gas comes into contact with the glass or receptacle placed beneath it. It has a first hood that acts as a protective casing and another second hood that covers only the spraying unit.

[0007] Furthermore, in this case, the incorporation of a mechanism for regulating the distance between the first hood and the base is planned, for instance, by means of the vertical displacement of the tubular body inside a telescopic-type device or vertical displacement of the area of the base on which the glass is placed.

[0008] Consequently, the object of this invention is to improve this cooling appliance by adding a spray head directed downwards and protected by a hood. Such improvements are aimed at firstly converting it into a compact, extractable unit that can easily be removed and coupled when required, and secondly, transforming it into an automatic system that can be switched on, connected and adjusted to the appropriate distance by just placing the glass or receptacle below the hood. It also has an electronic safety system based on infrared sensors, to prevent accidents, since the temperature of the CO₂ is so low that it could cause damage.

[0009] In addition, it should be mentioned that the applicant knows of no other invention with the same distinctive technical, structural and constituent characteristics or equivalent features as this new cooling device. Such characteristics are duly set forth in the final claims attached to this descriptive record.

BACKGROUND OF THE INVENTION

[0010] In particular, the cooling appliance proposed in this document, as indicated above, is based on the use of liquid CO₂, sprayed from a nozzle into a glass or other receptacle to cool it quickly at a very low temperature (between -20° C and -45° C), with a spraying unit formed a connection fitting connecting an electro valve to a lead through which the gas from the external CO₂ cylinder enters. That electro valve is connected to a programmable microprocessor that allows the gas output impulses and pauses to be regulated, and is coupled to a flow adjuster with at least one extended part into which the spraying nozzle with orifices is inserted. The gas emerges through those orifices to cool the glass or receptacle in question, and the entire spraying unit is housed between two overlapping protective hoods, such that only the nozzle head with the orifices emerges from the lower hood.

[0011] Based on that configuration, the appliance described in this invention has the particularity of it being inside a box, forming an extractable compact kit which gives the appliance considerable advantages over other known models.

[0012] Consequently, on one hand, it is much easier, faster and economical to perform operations on it such as entering parameters, maintenance and changing or repairing parts, since all that need be done is disconnect it from the lead that connects it to the CO₂ cylinder, re-

move it from the base, fixture or structure in which it is housed and take it to the workshop to be repaired or to any other place.

[0013] On the other hand, since the components of the appliance are housed and protected inside a box or casing forming a compact unit from which only the hood and hardware connection protrude, it is much easier to handle and more difficult for those components to be damaged.

[0014] Continuing with the invention, another of the important particularities of this new cooling appliance is that the above components are able to be activated automatically, meaning that it can detect the presence of a glass, goblet or any other similar receptacle, regulate the distance from the hood in order to position the hood over the receptacle and allow the gas to emerge through the spraying nozzle, based on parameters that are previously entered in the microprocessor.

[0015] Likewise, to prevent risks due to a failure in detecting the receptacle or the accidental entry of an object or hand, the appliance has an electronic safety system formed by a series of infrared sensors distributed along the lower edge of the hood, which immediately disconnect the appliance and prevent the gas from emerging and/or the lowering of the hood in such cases.

[0016] Logically, more simplified versions of the appliance can be built, such as a version in which there is no possibility of regulating the height, for use in situations that require greater cooling speed and in which the glasses or receptacles are practically always of the same type, for example, one that is installed next to a beer tap.

[0017] It should also be mentioned that as an option, an external protective dome can be added to prevent improper handling of the appliance by unauthorised persons when not in use.

[0018] The foregoing appliance for cooling glasses and receptacles forming part of a compact extractable kit that can be operated automatically is therefore an innovation with structural and constituent characteristics that do not presently exist in appliances used for this purpose and such reasons, together with its practical nature, are sufficient grounds to obtain the privilege of exclusivity that is being requested.

DESCRIPTION OF THE ILLUSTRATIONS

[0019] To complete the present description and allow the characteristics of the invention to be better understood, a set of illustrations is attached to this descriptive record, as an inseparable part thereof, for informative purposes, on a non-limited basis:

Figures 1 and 2.- These figures show, respectively, the object of the invention or appliance for cooling glasses and receptacles, already assembled and the component parts of that appliance, which forms part of an extractable kit with automatic operation, illustrating how it is operated and including the main parts and elements comprising it and their configuration

and layout.

Figure 3 shows a view of each of the components of the hood.

Figure 4 shows a perspective and part cross-section view of the hood with all the elements inside it, and in particular the electronic ring, duly coupled to it.

PREFERENTIAL APPLICATION OF THE INVENTION

[0020] Based on these illustrations and in accordance with the numbering, an example of the preferential application of the invention is shown, which includes the parts and elements described in detail below, whose numerical references correspond to the following elements:

1. Cooling appliance
2. Main box
3. Protective cover of main box 2
4. Hood support tube
5. External hood
6. Sliding body
7. Elevation support
8. Electric motor
9. Support of electric motor 8
10. Fibre-optic amplifier
11. Anchoring of amplifier 10
12. Electric connections
13. Lattice work casing
14. Cover of lattice work casing 13
15. Angled anchoring brackets of lattice work casing 13
16. Power supply
17. Controller or "driver motor"
18. Electric connector
19. Protective support of connector body 20
20. Connector body of lead 22
21. Angled anchoring plate of protective support 19
22. Lead
23. Orifice of tube 4 for output of lead 22
24. Spraying unit
25. Trim cover of sliding body 6
26. INA-type self-lubricating sleeves
27. Sintered sleeves
28. External mooring element of tube 4
29. Silent block
30. Special screw for anchoring the end of the motor 8
31. Bucolan-type shock absorber
32. Opening in main box 2 for hood support tube 4
33. Hardware connectors
34. Trim for hood 5
35. Internal hood
36. Support separating the hoods 5 and 35
37. Electronic ring
38. Fibre-optic viewers
39. Infrared sensors
40. Led-type luminous diodes

- 41. Ring for protecting electronic ring 37
- 42. Flaps for anchoring electronic ring 37
- 43. Bar for calibrating sliding body 6

[0021] Thus, as shown in figures 1 and 2, the cooling appliance (1) in question includes a main box (2), with a protective cover (3), to which is coupled a tube (4) supporting the hood which emerges from the top through an opening (32). At the distal end of the tube (4), curved downwards, hangs the hood (5) to which the spraying unit (24) is coupled. Inside that main box (2), inserted at the opposite end of that tube (4), is a mechanism for regulating its height, made up of a sliding body (6) connected with a calibrating bar (43) to an elevation support (7) which, adopting a broken configuration, is in turn connected to the end of a vertically-moving electric motor (8) attached to the box by means of a motor support (9).

[0022] That main box (2) also has a fibre-optic calculating amplifier (10), attached to the main box (2) by means of the respective anchoring (11), and to a series of electric connections (12) housed in a lattice work casing (13) with a cover (14) that is anchored by angled brackets (15) to the lower part of the main box (2) in which a 24V-10Amp power supply will also be placed (16), as well as a controller (17) or "driver motor" and a 220V electric connector (18).

[0023] Likewise, attached to the main box (2) at the external top part there will be a protective support (19) which includes a safety connector body (20), connected to it by means of an angled plate (21), to which is coupled the end of the lead (22) that emerges through an orifice (23) running through the interior of the tube (4), to the opposite end of which the spraying unit (24) in the hood (5) is connected.

[0024] In this way, the safety connector body (20) attached to that protective support (19), allows the lead to easily be connected without it being twisted or in an awkward or incorrect position that might damage it, since this is the most delicate element of the appliance in terms of safety.

[0025] On the other hand, entering into greater detail with respect to the sliding mechanism of the tube (4) for regulating the height of the hood, we should mention that the sliding body (6) which serves as a guide and is crossed by the tube (4), has covers (25) at the top and bottom that anchor the respective INA-type self-lubricating sleeves (26) and sintered sleeves (27) connected to the end of that tube (4) through a mooring element (28) and a silent block (29) to prevent vibrations and noise.

[0026] In turn, the end of the electric motor (8) is connected to the elevation support (7) by a special screw (30) and a Bucolan-type shock absorber (31), thereby also preventing noise or vibrations.

[0027] Lastly, on the side of the main box (2) there is a hardware connector (33) which, through the respective software, allows the appropriate parameters and programmes to be entered in the microprocessor.

[0028] As for the elements inside the hood (5), as

shown in figures 3 and 4, it is configured as an external protective cover for those elements and coupled to the tube (4) by means of an upper trim (34), as well as to the internal hood (35) and a separating support (36) in which the spraying unit (24) or gasification system is housed and at the edge of the internal hood (35) there is an electronic ring (37) attached with flaps (42) created in it for that purpose, on which at least one pair of fibre-optic viewers (38) rest as well as an emitter and a receiver, distributed on opposite points of it and a series of infrared sensors (39), distributed at equidistant points in sufficient number to cover the whole of the vertical space beneath the hood (5) and a series of luminous Led-type diodes (40) which illuminate the gas emissions.

[0029] In addition, that electronic ring (37) will be protected by a cover (41) made of clear material such as PMMA, to prevent foreign objects from entering the electronic ring (37).

[0030] In the light of the foregoing, the manner in which the appliance functions is as follows:

When a glass or receptacle is placed beneath the hood (5) of the appliance, the fibre-optic viewers pass over it and the mechanism that activates the electric motor is put into operation for the tube to move and position the hood at the appropriate height over the glass or receptacle, through the sliding body connected to it. Then the gas emerges, illuminated by the Leds.

[0031] If the object placed beneath the hood is not a suitable glass or receptacle, or if a different object is placed there or any other anomaly occurs, this is detected by the infrared safety sensors, thus preventing the mechanism from starting up or, if it is already in operation, making it stop immediately.

[0032] In sum, the appliance for cooling glasses and receptacles described above is based on the use of liquid CO₂, with a spraying unit housed between two overlapping protective hoods, formed by a connection fitting that connects an electro valve to a lead through which the gas from the external CO₂ cylinder enters. The electro valve is connected to a programmable microprocessor that allows the gas output impulses and pauses to be regulated, and a spraying nozzle with orifices is installed on it. The gas emerges through the orifices to cool the glass or receptacle placed beneath the hoods. The most important particularity of the appliance with respect to other known cooling appliances of this type is that it has a main box (2) with a protective cover (3) to the outer part of which the following elements are connected: the hood (5) and spraying unit (24), a hardware connector (33) for entering the appropriate parameters and programmes into the microprocessor and a protective support (19) with a safety connector body (20) for coupling to the tube coming from the CO₂ cylinder, all of which forms a compact, extractable kit fitted with elements for its automatic operation and for regulating its height

through fibre-optic viewers (38), and safety elements for automatically stopping the appliance through a series of infrared sensors (39).

[0033] Having described the nature of the present invention and the method for putting it into operation, it is not deemed necessary to describe it in any greater length, since any expert on the subject would understand its scope and the advantages it brings. It is hereby recorded that intrinsically, it can be operated in other ways differing in detail to the one given as an example, which will also be included within the scope of protection being sought, provided that its fundamental principle is not altered, changed or modified.

Claims

1. A COOLING APPLIANCE FOR GLASSES AND RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, of the type based on the use of liquid CO₂, with a spraying unit housed between two overlapping protective hoods, formed by a connection fitting that connects an electro valve to a lead through which the gas from the external CO₂ cylinder enters. The electro valve is connected to a programmable microprocessor that allows the gas output impulses and pauses to be regulated, and is coupled to a flow adjuster with at least one extended part on which, in turn, a spraying nozzle with orifices is positioned, with the gas emerging through the orifices to cool the glass or receptacle placed beneath the hoods, **characterised in that** it is formed by a main box (2) with a protective cover (3) to which the outer part of which the following are connected; the hood (5) and spraying unit (24), a hardware connector (33) for entering the appropriate parameters and programmes into the microprocessor and a protective support (19) with a safety connector body (20) for coupling to the tube coming from the CO₂ cylinder, all forming a compact, extractable kit fitted with elements for its automatic operation and for regulating its height through fibre-optic viewers (38), and safety elements for automatically stopping the appliance through a series of infrared sensors (39).
2. AN APPLIANCE FOR COOLING GLASSES AND RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, based on claim 1, **characterised in that** the main box (2) houses a fibre-optic calculating amplifier (10), a series of electric connections (12) and a 24V-10Amp power supply (16), a controller or "driver motor" (17) and a 220V electric connector (18); and because inserted in the opposite end of the tube (4) is a sliding body (6) connected by a calibrating bar (43) to an elevation support (7) which, adopting a broken configuration, is in turn is

connected to the end of an electric motor (8) with a vertical movement that is attached to the box by a motor support (9).

3. AN APPLIANCE FOR COOLING GLASSES AND RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, based on claims 1 and 2, **characterised in that** the protective support (19) which includes the safety connector body (20) is connected to the main box (2) by an angled plate (21); and because the end of the lead (22) emerging from an orifice (23) in the tube (4) is coupled to it.
4. AN APPLIANCE FOR COOLING GLASSES AND RECEPTACLES BUILT INTO A COMPACT EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, based on claims 1 and 2, **characterised in that** the sliding body (6) serving as a guide for the tube (4) and crossed by its, has covers (25) at the top and bottom which anchor the respective INA-type self-lubricating sleeves (26) and sintered sleeves (27), attached to the end of that tube (4) by a mooring element (28) and a silent block (29) to prevent vibrations and noises; and because the end of the electric motor (8) is connected to the elevation support (7) by means of a special screw (30) and a Bucolan-type shock absorber (31), to also prevent noise or vibrations.
5. AN APPLIANCE FOR COOLING GLASSES AND RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, based on claims 1 and 2, **characterised in that** on the edge of the external hood (5) attached to an interior hood (35), there is an electronic ring (37) upon which at least one pair of fibre-optic viewers (38) are supported, as well as an emitter and receiver, laid out at opposite points of the same, along with a series of infrared sensors (39), distributed in an equidistant manner in sufficient number to cover the whole of the vertical surface beneath the hood (5) and a series of Led-type luminous diodes (40).
6. AN APPLIANCE FOR COOLING GLASSES OR RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, based on claim 5, **characterised in that** the electronic ring (37) is attached to the internal hood (35) by a series of flaps (42).
7. AN APPLIANCE FOR COOLING GLASSES OR RECEPTACLES BUILT INTO A COMPACT, EXTRACTABLE KIT THAT CAN BE OPERATED AUTOMATICALLY, based on claim 5, **characterised in that** the electronic ring (37) is covered by a protective ring (41) made of clear material, such as PMMA.

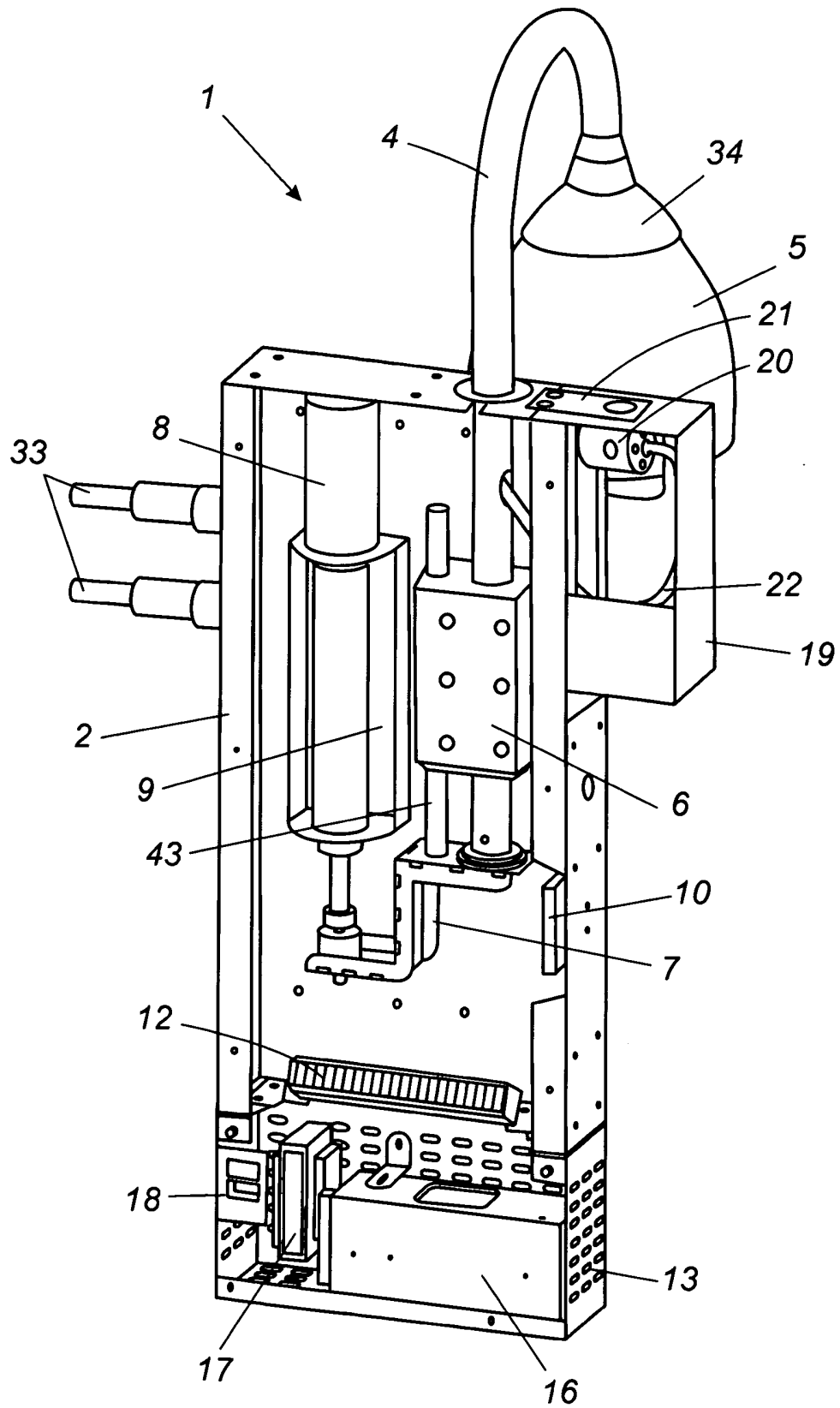


Fig. 1

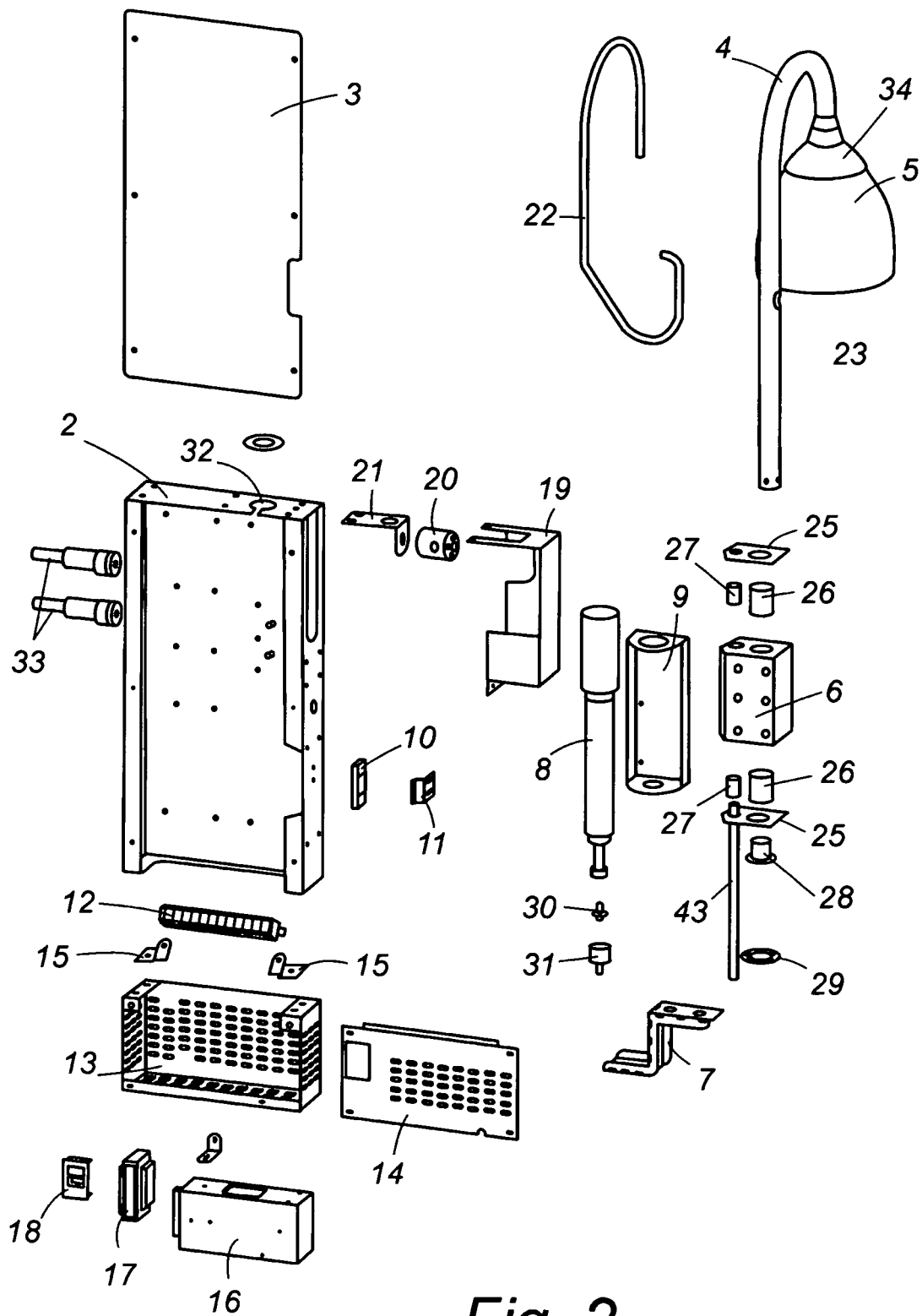


Fig. 2

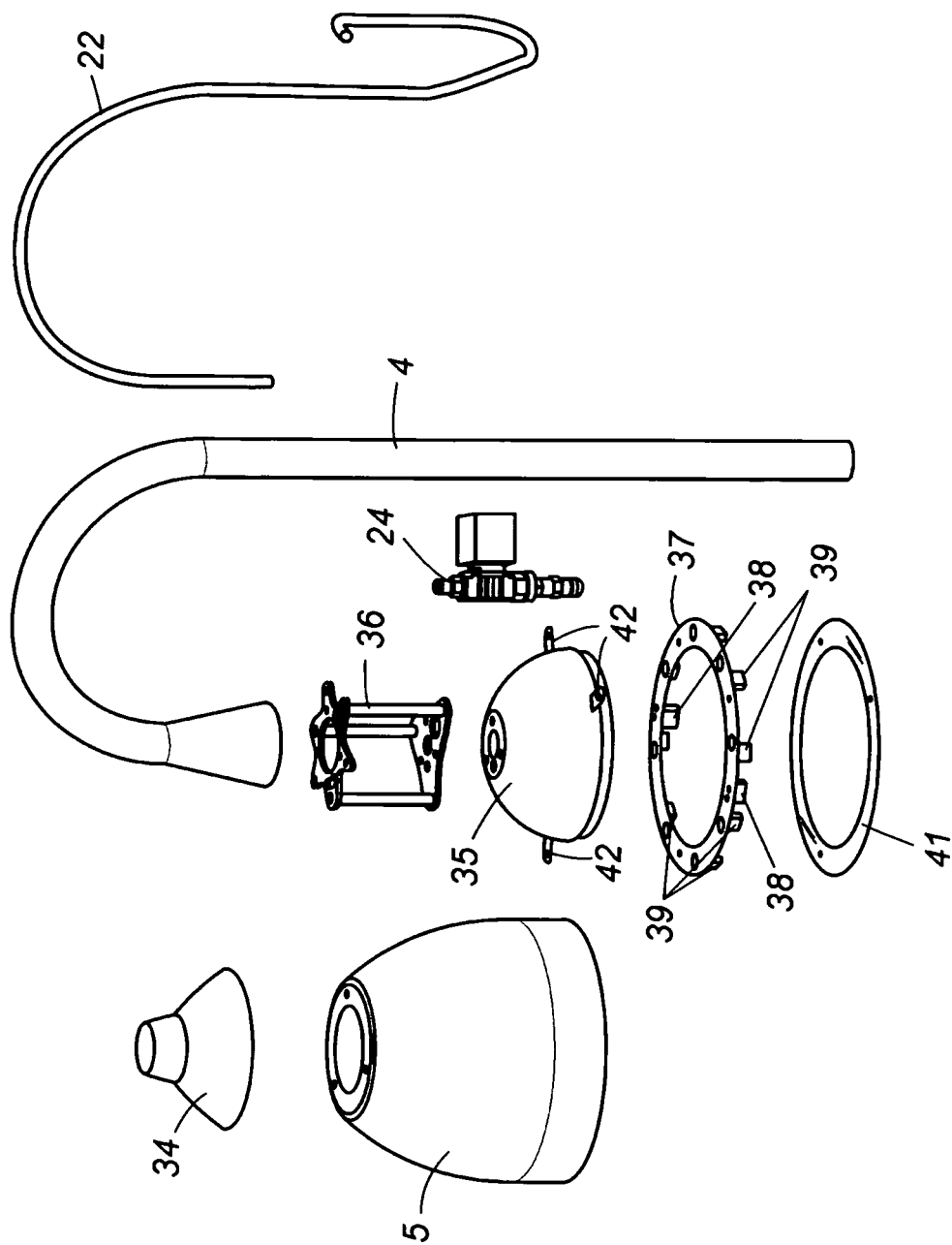


Fig. 3

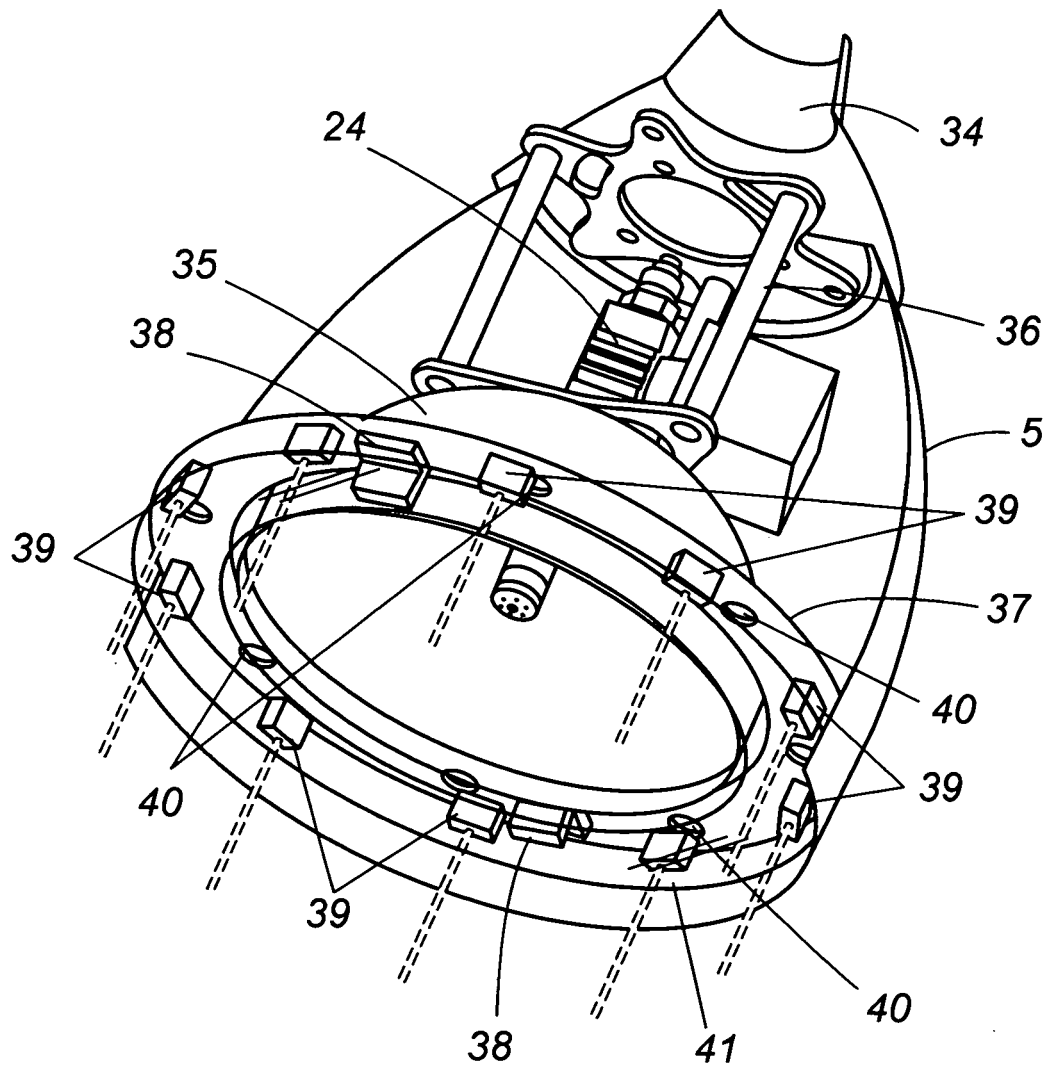


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2009/000446

A. CLASSIFICATION OF SUBJECT MATTER

see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

INVENES,EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1568956 A1 (WOLLENWEBER MARTIN) 31.08.2005, the whole document.	1-7
A	US 6070416 A (GERMAIN et al.) 06.06.2000, column 3, lines 1-7; figure 1.	1-7
A	US 3668888 A (ROSLONSKI et al.) 13.06.1972, the whole document.	1-7
A	US 3602008 A (KELLEY et al.) 31.08.1971, the whole document.	1-7
A	ES 8609681 A1 (LIQUID CARBONIC DE ESPANA S A) 16.12.1986, the whole document.	1-7

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"I"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance.		
"E" earlier document but published on or after the international filing date		
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed		
	"&"	document member of the same patent family

Date of the actual completion of the international search

09.April.2010 (09.04.2010)

Date of mailing of the international search report

(13/04/2010)

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Form PCT/ISA/210 (second sheet) (July 2009)

EP 2 476 985 A1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2009/000446

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
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ES 8609681 A	16.12.1986	NONE	-----

Form PCT/ISA/210 (patent family annex) (July 2009)

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F25D 3/10 (2006.01)

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REFERENCES CITED IN THE DESCRIPTION

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- ES P200900745 [0004]
- ES 200900313 W [0004]