



(12) **EUROPEAN PATENT APPLICATION**
 published in accordance with Art. 158(3) EPC

(43) Date of publication:
12.04.2000 Bulletin 2000/15

(51) Int. Cl.⁷: **F17C 13/12**, F16K 31/05,
 F16K 17/36

(21) Application number: **99900455.9**

(86) International application number:
PCT/ES99/00006

(22) Date of filing: **14.01.1999**

(87) International publication number:
WO 99/36727 (22.07.1999 Gazette 1999/29)

(84) Designated Contracting States:
**AT BE CH DE DK FI FR GB GR IE IT LI LU MC NL
 PT SE**

(72) Inventors:
 • **Galindo Fernandez, José Antonio**
28805 Alcalá de Henares (ES)
 • **Galindo Frutos, Juan Ram n**
28805 Alcalá de Henares (ES)
 • **Lopez Perez, José Luis**
28805 Alcalá de Henares (ES)

(30) Priority: **14.01.1998 ES 9800056**

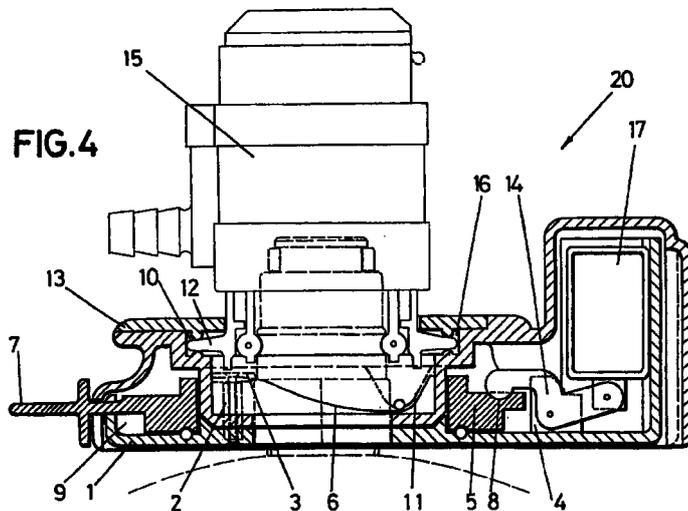
(71) Applicants:
 • **Galindo Fernandez, José Antonio**
28805 Alcalá de Henares (ES)
 • **Galindo Frutos, Juan Ram n**
28805 Alcalá de Henares (ES)
 • **Lopez Perez, José Luis**
28805 Alcalá de Henares (ES)

(74) Representative:
Del Campo Castel, Domingo
Puerto Rico, 8-B-1.o-B
28016 Madrid (ES)

(54) **SAFETY DEVICE FOR DISCONNECTING THE REGULATOR OR THE LIKE, APPLICABLE TO GAS SUPPLIED INSTALLATIONS**

(57) A safety device for disconnecting a regulator or similar, applicable to plants fed by gas, consisting of a base (1), fitted with guiding columns (2), and having a retaining ring (3), and incorporating a support (4) for a retaining trigger, and a shuttle (5), which is mobilized by a ramp (6), having a reinstating control (7), and a housing (8) for the interlocking of the trigger, as well as a

space (5) for housing a spring mobilizing the device, which is optionally replaceable by an electromagnet or motor-reducer, presenting a shuttle latch (10), a runner (11), a retaining ring (15) for the regulator, a closing cover (13), as well as said interlocking trigger (14), and a housing for the retaining ring of the regulator (15).



Description

BACKGROUND OF THE INVENTION The present specification relates to a safety device

[0001] for disconnecting a regulator or similar device, applicable to plants fed by gas, the purpose of which is to automatically disconnect and displace a regulator or similar device, by means of which the extraction of the content of a liquified gas cylinder is carried out, such as a butane, propane or any other type of gas cylinder.

FIELD OF THE INVENTION

[0002] This invention will find application in the industry related to the manufacture of safety devices, apparatus and elements for gas plants, preferably applicable to cylinders containing liquified gas.

RELATED ART

[0003] The applicant is aware of the existence, at present, of a device or apparatus which is conventionally known as "regulator", which is used to regulate the flow of a gas contained in a liquified gas cylinder. This regulator is hermetically coupled to the valve of the own liquified gas cylinder, being tightly set by means of a part so-called retaining ring, which operates the fastening mechanism, in the strict sense.

[0004] On the other hand, the applicant is aware of the existence, at present, of a plurality of devices and apparatus, which duly installed generate, starting from themselves, an alarm signal in the case these devices or apparatus detect a gas leak generating a bag, or even - the simple detection of a gas leak generates an acoustic and optical emission warning the plant's user about the existence of a leak.

[0005] Also, the applicant is aware that these alarm devices or apparatus can be connected to an alarm Station, of any kind and entity, in which the activation of the sensors installed in the safety devices will be shown; this information, given at the same time to the user, will activate the action of a qualified personnel who, immediately will come to the spot where the gas leak has been located.

[0006] In all cases, the leak detectors of any kind generate the alarm of acoustic and optic devices, but in no case these safety devices act by themselves to obviate in an immediate way, the escape of the gas from its container in order that, independently of the fact that the leak will be palliated or not, the plant remains inoperative, generating an alarm warning the user about the existence of a gas leak, impeding the plant to be reinstated until the own leak or anomaly has been repaired.

[0007] On the lines of the above, it would be desirable to rely on a safety device that, independently of the emission of an acoustic or optical alarm, would gener-

ate by itself an automatic stop or disconnection of the regulator or similar element, according to which the extraction of the contents of the gas incorporated in the cylinder is obtained, acting in an effective way and impeding the provocation of an accident of variable characteristics, which are on the order of explosions, fires, and even building, factory or area destruction where the gas leak has been generated.

SUMMARY OF THE INVENTION

[0008] The safety device for disconnecting a regulator or similar element, applicable to plants fed by gas as proposed by the invention, constitutes per se a clear novelty in its field of application, since, according to its particular characteristics and in collaboration with a gas detector, it achieves that the element configured as a regulator or similar device, the application of which to the valve of a liquified gas cylinder generates the extraction of its contents, automatically moves from the working site, and the plant remains inoperative and the liquified gas cylinder is fully closed owing to the out of working position of the regulator itself, which, once deblocked, renders the tray unfit to emit a flow of its contents outward.

[0009] In a more concrete way, the safety device for disconnecting a regulator or similar element, applicable to plants fed by gas, which is the object of the present invention, is specifically designed, in order to house, in suspension, the lower portion of the device so-called base, on which a part named detachment shuttle slides, rotating in a semicircular sense, the motion of which deblocks the retention and disconnects the regulator duly hanged on the liquified gas cylinder valve, the regulator being specifically housed on a part so-called retaining ring of the regulator in the strict sense, the link between the regulator and the valve of the liquified gas cylinder being automatically displaced and disconnected, without modifying or disturbing the conventional manoeuvrability and handling qualities of same.

[0010] Obviously, the operation of the safety device is implemented by a gas, fire or other risk system, which when detecting a risk on the air the site where it is installed -this risk being logically caused by a gas, fire or atmospheric pollution-, it generates a signal to mobilize the shuttle in fractions of a second, elapsed after detecting the located leak.

[0011] It should be pointed out that this device is duly designed to be installed on the most of the regulators existing today in the market, both at a national and international level.

[0012] The device is constituted starting from three fundamental parts, duly combined, to wit:

- 55 - A base
- A detachment shuttle

- A shuttle latch

[0013] It should be noted that the part so-called shuttle latch is fixed to the retaining ring of the regulator, so forming a floating body, which intervenes in view of the warning signal from the leak detector in a few fractions of a second.

[0014] The operation of the device is performed by means of a permanently taut spring, and it relies on a retention, by means of an electromagnet, of the limiting stroke of the detachment shuttle, which generates the regulator disconnection, and, as above mentioned, the intervention of the device is performed immediately after the warning signal emitted by a detection system configured as a leak detector or similar device, automatically and precisely interrupting and cancelling the feeding electric voltage of the device in question, which, having no feed, generates a reaction cancelling any magnetic - field or current flow in the device, the result being a mobilization or detachment of the regulator on the liquified gas cylinder, which redounds to not to allow it to be connected while the warning signal is on.

[0015] Optionally, the invention can be fitted with a driving unit by means of a micromotor/reducer, and the rotation motion transmission will be performed by means of a reducer attacking pinion with the detachment shuttle, constituted like a toothed crown, with a stroke limiter by means of a microreducer, generating the regulator disconnection with the intervention of the warning signal - emitted by the detecting system, device or apparatus, which sends an electric voltage activating the device, detaching the assembly formed by the components so-called regulator, fixed to the cylinder, and the device to which the regulator is fixed.

[0016] In synthesis, the invention is configured starting - from the functional combination of a base part, having a hexagonal axial drill, having a suitable shape for allowing the nut on the cylinder neck to pass, configured like a valve in the strict sense, to which it is to be coupled, being fitted with three columns acting as guides, on which a retaining ring is housed, the function of which is to support in a hanging position the device which is the object of the present invention, relying on a housing to receive an electromagnet, or, optionally, the micromotor/reducer, and on said columns, the part - constituting the shuttle slides in a rotating motion, this part being fitted with a limited stroke, and having three equidistant sliding ramps having a gradual radius, relying on a housing for the retaining trigger, and an appropriate manual arming grip or handle, in the inner diameter of which the part constituting the latch is coupled.

[0017] The latch has a hexagonal axial drill in correspondence with the drill located or arranged at the base part, sliding on the above mentioned three guiding columns, and its stroke being limited by a retaining ring, configuring a linear movement when the shuttle carries out the stroke, and consequently creating a space

between the latch and the base/shuttle equivalent to the difference in height of the rolling race, with length enough to disconnect and displace the regulator from its initial housing.

5 **[0018]** It should be pointed out that the parts composing the object of the invention can be made of any type of material as deemed necessary, this material presenting characteristics with regard to lightness and endurance, - such as injectable plastic, polyester, aluminium, etc. material

DESCRIPTION OF THE DRAWINGS

15 **[0019]** In order to complement this description and aid to a better understanding of the characteristics of the invention, the appending drawings, which are a part of this specification, show, by way of illustrative and non-limiting example, the following figures:

20 Figure 1 shows a perspective view of the object of the invention, related to a safety device for disconnecting a regulator or similar, applicable to plants fed by gas, object of the invention, showing also, in this graphic representation the device in question, as seen from the upper part and, and at a time, the regulator incorporated, which, as mentioned in the specification, can be of any type.

25 Figure 2 shows a perspectiva view of the object of the invention similar to that represented in figure 1, without incorporating the regulator, and with the upper part moved away which facilitates the coupling of the regulator on the device.

30 Figure 3 shows a perspective view of the two parts constituting the chassis or structure of the object represented in figures 1 and 2, seen in perspective from its inner portion.

35 Figure 4 corresponds, lastly, to a side elevational view, duly sectioned, of the object of the invention, on which a regulator of any type is coupled.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

45 **[0020]** From of these figures, it can be seen that the safety device for disconnecting a regulator or similar, applicable to plants fed by gas (10), is constituted starting from a base part (1), which is centered on the hexagonal section of a nut located on the valve neck of a liquified gas cylinder, retaining its circular motion, and the base part (1) being fitted with three equidistant columns (2), to the upper part of which a retaining ring (3) is fixed, the function of which is to position, in suspension, the whole assembly of the device, and incorporating a support for the retaining trigger (4), relying on the lower surface, and at a time, centering it both axially and

diametrically with a turn on steel balls, on a part so-called shuttle (5), which is fitted with three sliding ramps (6), equidistantly located and fitted with a gradual radius.

[0021] The device (10) has a manual armed control (7), and a housing (8) for interlocking or housing (8) a trigger (14), and presenting a space (9) to house a spring (not referenced), according to a circular motion is obtained.

[0022] The latch (10) of the shuttle (5) is centered on the hexagonal section of the nut located on the neck of the valve of the liquified gas cylinder, in correspondence with the same configuration of the base (1), sliding it in a vertical sense on the guiding columns (2), within the path limited by a retaining ring, generated by the action of a runner (11) on the sliding or detaching - ramps (6) , in its path over the gradual radius with the turning of the detachment or sliding shuttle (5), generating a displacement of the latch (10) of the shuttle (5) of the assembly formed by the base (1) and the mentioned shuttle (5).

[0023] The latch (10) of the shuttle (5) relies on a housing (16) the function of which is to position the regulator (15), centering on its own retaining ring of the regulator (15), and as only contact with same, the device being blocked by means of a closing cover (13).

[0024] The device is made up by the retaining trigger (14), having as a joint point the support (4) of the base (1) of the device (20)=

[0025] In synthesis, it should be pointed out that the device is designed, in principle, to be coupled to liquified gas cylinders, in which the regulator is positioned on the neck of the own liquified gas cylinder, configured as the valve of the liquified gas cylinder, and the fitting of the regulator (15) is performed under pressure by means of the retaining ring (3), the regulator control (15) being located on the upper part of same, but it is obvious that the device can be fitted to other type of regulators (15), capable of presenting or incorporating the operation control on a side.

[0026] It must be born in mind, in a specific way, that the regulator configuration (15) is of a less importance, since it has no influence on the operation of the object of the invention.

[0027] On the lines of the above mentioned in the foregoing paragraph, it is checked that the device (20) can be installed thanks to a retaining ring (12) on any type of regulator (15), specifically on the different models used in the market in a conventional way, both at a national and an international level, and it is obvious that they can be fitted on butane or propane gas cylinders, and also on regulators of free outlet or adjustable pressure.

[0028] It should be pointed out that the safety device has an electromagnet (17).

[0029] The invention automatically intervenes in view of the existence of a risk on the air of any nature, such as the presence of a gas, fire, pollution, etc., etc.,

disconnecting and paralyzing the gas contained in the container or in the network itself.

Claims

1. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, of those destined to allow a regulator or similar (15) of any type or kind to be disconnected, either on butane or propane cylinders, and configured like regulators (15) having a free outlet or of the type under pressure, characterized in that the device (10) is configured with parts obtained starting from light materials, such as injected plastics, polteter, aluminium, etc., being formed starting from a base part (1) centered on the hexagonal section of a nut located on the neck of a liquified gas cylinder, retaining the circular motion, and having three equidistant guiding columns (2), on the upper part of which there is a retaining ring (3), which positions in suspension the assembly of the device (20), and incorporating a support (4) for a retaining trigger, and having, on the lower surface, centering axially and diametrically with turning on steel ball, a part constituting a shuttle (5), fitted with three sliding ramps (6), equidistant located and fitted with a gradual radius, presenting a manual armed control (7), as well as a housing (8) to receive the retaining trigger, and having a space (9) to house the spring generating a circular motion.
2. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, according to claim 1, characterized in that it has a latch (10) located on the hexagonal section of a nut situated on the neck of the valve of a liquified gas cylinder, in correspondence with the base (1), and sliding in a vertical sense on the guiding columns (1), its path being limited by the retaining ring (1) by the action of a runner (11) on the sliding ramps (6), in its path over the gradual radius with the turning of the shuttle (5), the latch (10) of the assembly formed by the base (1) and the shuttle (5) being displaced.
3. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, according to claim 2, characterized in that the latch (10), fitted with a housing (16) for the retaining ring (3) of the regulator (15), is centered by its retaining ring (12), the device (20) being blocked by a closing cover (13).
4. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, according to the preceding claims, characterized in that it has a retaining or interlocking trigger (14), fitted with a joint point configured as the support (4) of the base (1) of the device (20).

- 5. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, according to the preceding claims, characterized in that, optionally, the device (20) can be activated by an electromagnet or motor-reducer (17). 5

- 6. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, according to the preceding claims, characterized in that the device (10) can be applied to regulators (15) located on butane or propane gas cylinders, and on regulator of free outlet or under adjustable pressure. 10

- 7. Safety device for disconnecting a regulator or similar, applicable to plants fed by gas, according to the preceding claims, characterized in that the safety device is implemented by a safety system of any nature destined to detect gas leaks, fires or other anomalies, generating a signal to mobilize the shuttle and other elements of the safety device, when detecting a risk on the air in an enclosure. 15
20

25

30

35

40

45

50

55

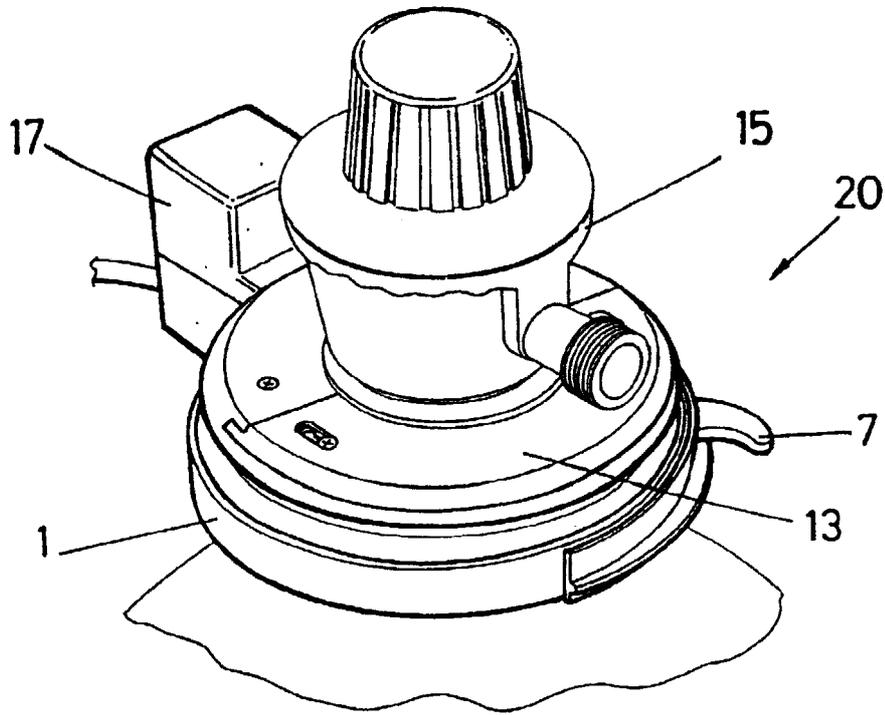


FIG. 1

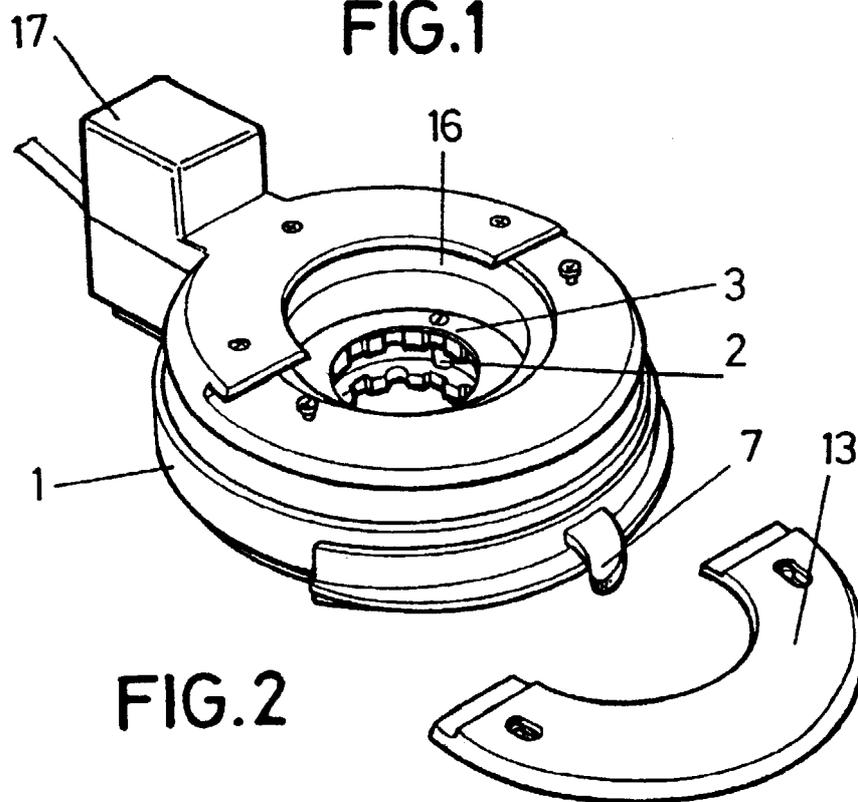


FIG. 2

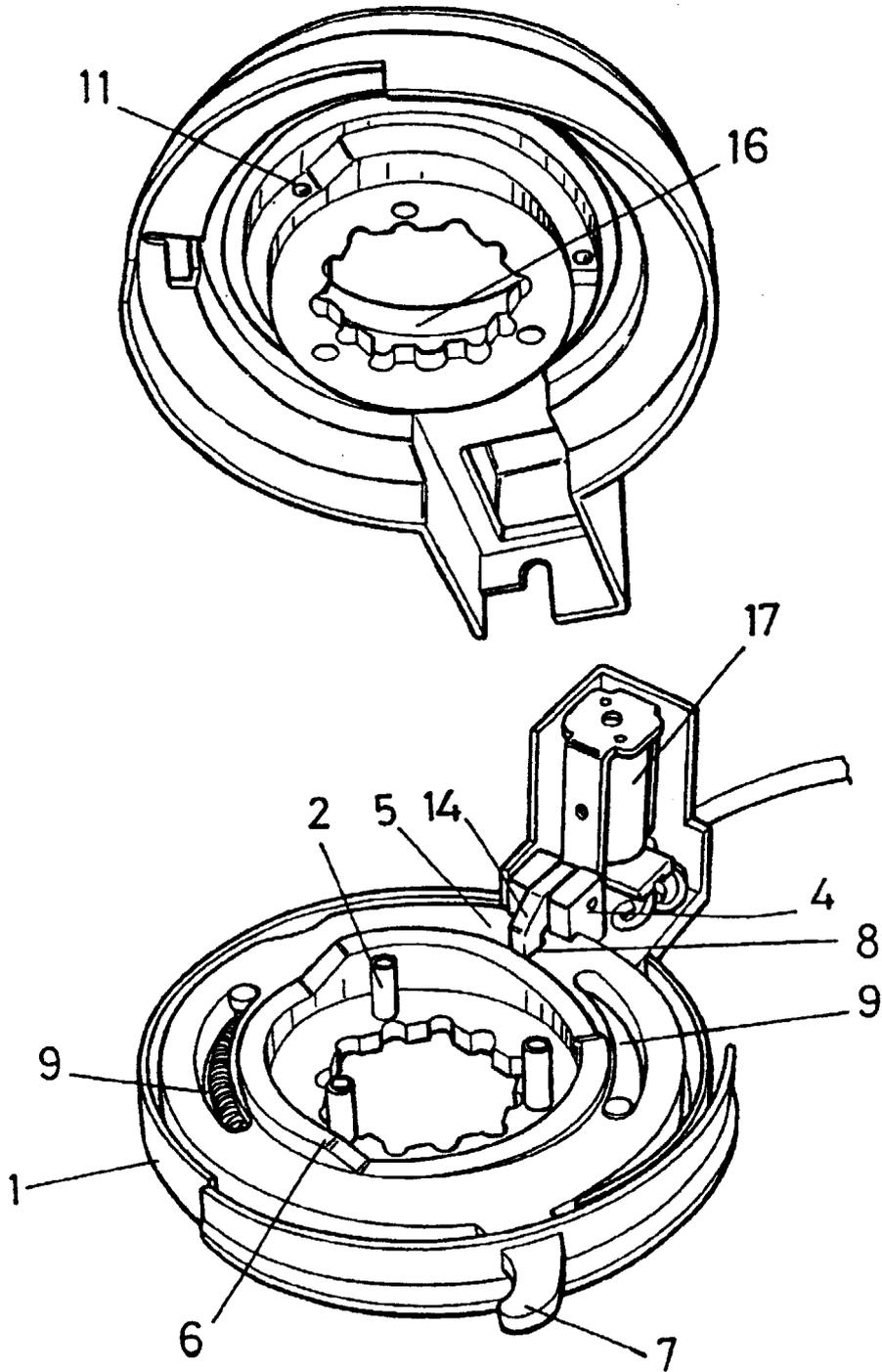
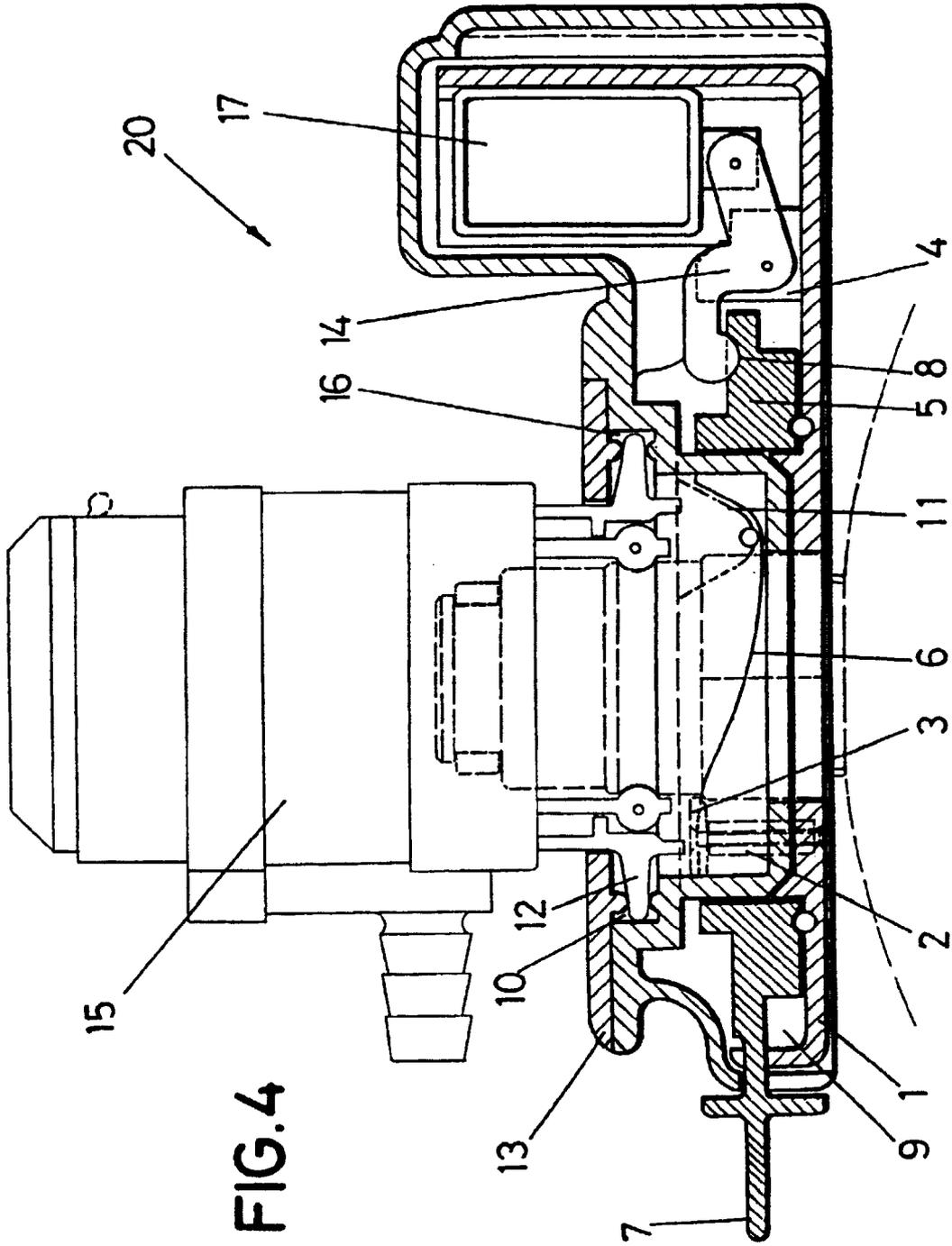


FIG.3



INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 99/00006

A. CLASSIFICATION OF SUBJECT MATTER		
IPC6: F17C 13/12, F16K 31/05, 17/36 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) IPC6: F17C, F16K		
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) CIBEPAT, PAJ, WPI, EPODOC		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 295227 U (GALINDO) 1 April 1987 (01.04.87) see the whole document	1-7
A	ES 287522 U (OCA) 1 January 1986 (01.01.86) see the whole document	1,3-7
A	ES 270791 U (SEGURGAS) 1 August 1983 (01.08.83) pages 6-8; figures 1-3	1,3,5,6
A	ES 260987 U (GALINDO) 16 July 1982 (16.07.82) see the whole document	1,3-6
A	ES 250992 U (GALINDO) 1 February 1981 (16.02.81)	
<input type="checkbox"/> Further documents are listed in the continuation of Box C.		<input checked="" type="checkbox"/> See patent family annex.
* Special categories of cited documents:		"T" 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		"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
"E" earlier document but published on or after the international filing date		"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 such documents, such combination being obvious to a person skilled in the art
"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)		"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search	Date of mailing of the international search report	
13 April 1999 (13.04.99)	23 April 1999 (23.04.99)	
Name and mailing address of the ISA/ EUROPEA S.P.T.O.	Authorized officer	
Facsimile No.	Telephone No.	

Form PCT/ISA/210 (second sheet) (July 1992)