(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 077 440 A1

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

(43) Date of publication:
21.02.2001 Bulletin 2001/08

(21) Application number: **99916935.2**

(22) Date of filing: **05.05.1999**

(51) Int. Cl.[7]: **G09F 3/03**, G08B 13/22, B67D 5/33

(86) International application number:
PCT/ES99/00122

(87) International publication number:
WO 99/57701 (11.11.1999 Gazette 1999/45)

(84) Designated Contracting States:
BE DE FR GB IT

(30) Priority: **05.05.1998 ES 9800940**
07.05.1998 ES 9800968

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(54) **ELECTRONIC SEAL**

(57) It is comprised of a closure element (4) for closing the medium to be sealed and is characterized in that it also hat signal emitting means (2) which are connected to the closure element (4) forming the signal conducting means. The conductor (4) is connected to signal receiver means (3). It also has incorrect reception signalling means (13, 14) indicating that the conductor element (4) has been manipulated. It includes means (20) for stopping the operation of the sealed device upon detection of a fraudulent manipulation.

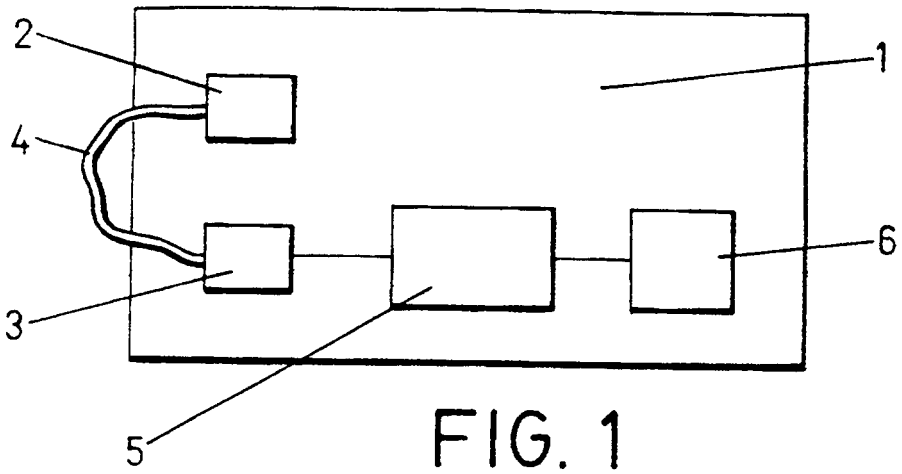

FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The invention in question refers to a fuel pump with an electronic seal, whose object is to generate a warning when the fuel pump has been fraudulently handled, in such a way that the user can detect the possible fraudulent handling of the pump, upon knowing the circumstance that the amount of fuel supplied does not correspond with the amount of fuel indicated on the display provided for in the fuel pump.

[0002] Besides, in this case, the object of the invention is to provide a second display showing the real amount of supplied fuel.

[0003] Another object of the invention consists of blocking the operation of the fuel pump upon detecting fraudulent handling.

[0004] The invention especially conceived for its application in pumps for petrol, diesel oil pumps, etc., can obviously be applicable to any type of pump.

BACKGROUND OF THE INVENTION

[0005] The use of seals for meters and similar devices is conventionally known, seals that are comprised of a sealing element, such as a wire, that closes access to the box or container of the meter, in such a way that the seal ends in a piece of lead through which the ends of the wire are introduced, the seal being materialized upon pressing the piece of lead by a machine, pressing the wires in order to immobilize them preventing access to the meter. Despite this, the seal can be fraudulently handled by cutting the wire, a circumstance that represents the notorious fraudulent handling of the sealed device.

[0006] Furthermore, this seal has the added inconvenience that it is easily fraudulently handled without the need of cutting the wire, in such a way that the count of the meters can be falsified without this being detected.

[0007] On the other hand, different types of electronic seals are known, such as those disclosed in WO-A-90/07759, US-A-4571691, US-A-4982985 and Derwent Abstract No. 1998-205937 (SE-A-9602435).

[0008] On the other hand, the prior art only too well teaches the use of fuel pumps, which are constituted by an absorption pump of the fuel stored in a tank, said pump being connected to a volumetric meter which in turn is connected to an encoder, in such a way that the encoder provides a signal proportional to the amount of supplied fuel.

[0009] Besides, the encoder is connected to electronic calculating and display means of the supplied fuel, in such a way that the user knows the amount of acquired fuel.

[0010] Upon operating the fuel pump for the first time, the Ministry of Industry adjusts the volumetric meter to the real value of the supply, for which purpose it carries out a gauging by the measurement with special test pieces. Once this operation has been carried out these elements are sealed so that they are housed in a container whose access gate or cover constitutes the sealing means.

[0011] The sealing is carried out by means of a sealing element, such as a wire or the like, which ends in a piece of lead through which the ends of the wire are introduced, in such a way that a machine presses on the piece of lead preventing access to the container.

[0012] This type of seal, as it has already been indicated, has the inconvenience that it is easy to fraudulently handle, in such a way that the gauging of the volumetric meter can be varied whereby the amount of supplied fuel is smaller than the amount of fuel shown on the displays, which represents fraud.

[0013] There is also the possibility of carrying out fraudulent operations of the electronic means that calculate the amount of fuel drawn in by the pump, for which purpose the memory of the microprocessor of the electronic means is modified, in such a way that upon receiving the impulses from the encoder a smaller percentage of these impulses is subtracted, in such a way that the reading shown on the display means does not correspond with the supplied fuel. This fraudulent handling of the change of the memory can be carried out by inserting codes from the outside, which can be sent in different ways, such as by means of an electric line, infrared signals, by radio, etc.

[0014] For this purpose, the corresponding receivers that make possible the arrival of said codes must be included in the fuel pump, receivers that may be for example infrared receivers, radio receivers, etc. These receivers send a signal to the microprocessor of the electronic equipment in such a way that it subtracts the indicated percentage of the fuel.

DESCRIPTION OF THE INVENTION

[0015] In order to solve the above-mentioned inconveniences, the invention has developed a fuel pump with electronic seal in accordance with claim 1, that permits fraudulent handling to be detected, by sending a warning that this circumstance is taking place, at the same time that it carries out the cutoff of the operation of the sealed device.

[0016] For this purpose, the seal, just like the conventional ones, has a sealing element of the means to be sealed, and is characterized in that it comprises emitting means for emitting a signal, said means being connected to the sealing element, in such a way that this element is a conducting means of this signal.

[0017] Besides, the seal has receiving means for receiving the signal produced by the emitting means, in such a way that if the cutoff of the sealing element is carried out, this circumstance is detected by the receiver, generating a signal indicating that the recep-

tion is incorrect and that there is therefore fraudulent handling of the sealed device.

[0018] The emitting means, signal receivers and the incorrect reception indicators are housed in the sealed means, in such a way that the sealing element, that is a conducting means, comes outside through the frame containing the sealed device, moving through the sealing points of said container, in such a way that the only way of having access to the inside of the container is by means of cutting the signal conducting means.

[0019] In a preferred embodiment, the emitting means and receivers are installed in an independent box from which the (lock type) sealing element projects, it being possible for the box to be airtight or sealed by the seal itself.

[0020] The incorrect reception signaling means can be defined by means detecting the absence of a signal in the receiver.

[0021] There is also the possibility that the signaling means of incorrect reception are defined by a comparator that compares the emitted signal with the received signal, in such a way that if both signals do not coincide, the incorrect reception signal is produced.

[0022] The emitting means can be defined by a light emitter and therefore, the receiving means are constituted by a light receiver, the sealing element preferably being an optical fiber.

[0023] There is also the possibility that the emitting means are defined by an electric signal emitter, and therefore the receiving means are defined by an electric signal receiver, in which case the sealing element is an electric signal conductor, such as, for example, a copper wire.

[0024] The incorrect reception signaling means can be optical and/or acoustic indicators that may be located in the container itself of the sealed device, independent box, or in a remote place.

[0025] Likewise, the incorrect reception signaling means may be connected to a modem and/or radio emitter in order to send the signal to a remote place.

[0026] In any case the signal emitting means can emit a continuous signal that can be modified, or on the contrary they can be connected to a programmable pulse train generator.

[0027] Besides, the seal of the invention has means to block/deblock the operation of the sealed device upon detecting an incorrect reception.

[0028] It can also have means to detect the opening/closing of the gate or cover of the sealed means, and/or of the independent box, the means to detect being connected to a timer in order to activate the blocking means of the operation of the sealed device, once the timed time has gone by, time counted from the detection of the opening of the closing cover or gate of the container, and in order to activate the seal after the closing of the gate or cover and once the timing time has gone by.

[0029] Another characteristic that can be included in the seal of the invention, consists of providing it with means for introducing and storing a code that is connected to the blocking/deblocking means of the operation of the device, in such a way that if the introduced code coincides with the stored one during the course of the timed time, it prevents the blocking of the sealed device or the deblocking of the sealed device is produced, if it were blocked.

[0030] Besides, the invention has means for blocking the sealed device upon detecting the opening and closing of the gate or cover of the device or of the independent box, without the code having been introduced.

[0031] Obviously, the seal can include a microprocessor that carries out the above-mentioned functions.

[0032] The electronic sealing device has a sealing element of the container provided in the fuel pump which includes the pump, volumetric meter and impulse generator (encoder), in such a way that the encoder produces a signal proportional to the supplied fuel, the fuel pump also having the corresponding electronic calculating and display means of the supplied fuel.

[0033] The invention has fraudulent handling detecting means of the sealing element of the gate or cover of the container of the pump, means that are connected to cutoff/connecting means of the feed of the pump upon detecting fraudulent handling of the gate or cover of the container.

[0034] Besides, the encoder of the fuel pump is connected to second electronic calculating and display means of the supplied fuel, all in such a way that these second means are sealed by the sealing element of the container.

[0035] Another encoder could also be put in place for the control of the encoder itself, which could be placed in an extension of the shaft itself, in such a way that this second encoder forms part of the system itself.

[0036] The fraudulent handling detecting means of the sealing element of the gate or cover of the container of the pump are defined by:

- signal emitting means that are connected to the sealing element, in such a way that this element defines a conducting means of said signal;
- signal receiving means;
- incorrect reception detecting means.

[0037] In this case, the cutoff/connecting means of the feed of the pump, produce the cutoff of the feed of the pump when an incorrect reception is detected.

[0038] The second electronic calculating display means of the supplied fuel can be included in the sealed container or in the independent sealed box.

[0039] The two electronic calculating and display means of the supplied fuel can be connected to some comparing means and these comparing means, to some fraudulent handling detecting means, which activate the cutoff/connecting means of the pump when the calculated value of the fuel in both means does not coin-

cide.

[0040] The incorrect reception signaling means can be basically defined by a comparator that compares the emitted signal with the received signal so that if both signals do not coincide, these means produce an incorrect reception signal.

[0041] Likewise, the incorrect reception signal means can include optical and/or acoustic indicators.

[0042] Advantageously, the acoustic means are defined by a voice synthesizer, in such a way that this synthesizer warns the user by means of a spoken message, so that he checks the reading of the two display means of the supplied fuel.

[0043] The emitting means can be defined by a light emitter or an electric emitter, while the sealing element can be an optical fiber or another light conducting element or an electric conductor, and the receiving means can be light receivers or electric receivers, just as it has been indicated above in a generic manner.

[0044] The incorrect signaling means can be connected to a modem or to a radio frequency emitter in order to send the signal to a remote place.

[0045] The signal emitting means can be connected to a programmable pulse train generator in such a way that the seal can be personalized.

[0046] Besides the independent box and/or container of the pump, can include means for detecting the opening/closing of the access gate or cover, said means being connected to a timer in order to activate the feed cutoff means of the sealed pump after the timed time from the detection of the opening of the cover or gate of the box and/or container has gone by, and in order to connect the feed of the pump after the closing of the door and the timed time has gone by.

[0047] Advantageously, the invention also has means for introducing and storing a code, means that are connected to the cutoff/connecting means of the feed of the pump, in such a way that if the code introduced by means of a keyboard, coincides with the code stored during the course of the timed time, the cutoff of feed of the sealed pump is prevented, or the connection of the sealed pump is produced, if the pump is disconnected.

[0048] Besides, the invention can have means to cut off the feed of the sealed pump upon detecting the opening and closing of the gate or cover of the container and/or of the box, without the safety code having been introduced.

[0049] The cutoff/connecting of the feed of the pump can be done by means of a bistable relay whose state is controlled by the incorrect reception detecting means.

[0050] The circumstance could occur that in order to carry out the fraudulent handling of the device of the invention, the cutoff of the containing box is carried out, for which purpose the box includes means to detect the moment when the feeding of the pump is produced, in such a way that upon activating the pump, if there is no feed in the different means included in the box, the bistable relay is activated cutting off the feed of the pump.

[0051] Obviously, the invention can have the corresponding battery that permits the memorization of the different codes and states of the device of the invention in the event that there is a cutoff of the electric energy supply.

[0052] Advantageously, the seal of the invention basically has a microprocessor that carries out the above-mentioned functions.

[0053] In order to complete the description that is going to be made hereinafter and for the purpose of providing a better understanding of the characteristics of the invention, the present specification is accompanied by a set of drawings, in whose figures, the most characteristics details of the invention are represented in an illustrative and non-restrictive manner.

BRIEF DESCRIPTION OF THE FIGURES

[0054]

Figure 1 shows a functional block diagram of a basic embodiment of the electronic seal.

Figure 2 shows a functional block diagram of another possible embodiment of the electronic seal.

Figure 3 shows a block diagram of a possible embodiment of the invention.

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0055] Hereinafter a description of the invention is made based on the above mentioned figures.

[0056] First of all a basic embodiment of the seal is described, for which purpose there is an independent box (1) which includes inside it an optical emitter (2), such as a light emitter, and an optical receiver (3), both being connected by means of a light conductor, such as an optical fiber (4), which constitutes the sealing element of the container of the device to be sealed, for which purpose said sealing element projects through the box and passes through the corresponding holes provided for in the gate or cover for access to the container just as it is conventionally done.

[0057] The receiver (3) is connected to a reception failure detecting circuit (5) and this circuit to an acoustic and/or optical indicator (6).

[0058] Based on the description made, it is easily understood that in order to have access to the inside of the container it is necessary to cut the optical fiber (4), in such a way that the conducting path of the optical signals produced in the emitter is interrupted, whereby they do not reach the receiver, a circumstance that is detected by the circuit (5) which activates the acoustic and/or optical indicator (6) warning that the seal has been cut.

[0059] The acoustic and/or optical indicator may be

located in a remote place, in such a way that this circumstance may be known in a control center.

[0060] Figure 2 shows another embodiment of the seal, wherein the emitter (2) is an impulse emitter whose train may be varied in number as well as in time, for which purpose a memory (8) that is connected to an encoder (7) is provided for and this encoder is connected to the emitter (2) and to an oscillator (9), in such a way that the code stored in the memory (8) is codified according to the impulses produced by the oscillator (9), the code stored in the memory (8) being emitted by the emitter (2). Said code may be varied by means of a keyboard or microswitches (10).

[0061] These characteristics permit each seal to be personalized depending on the user's needs.

[0062] In order to maintain the state of the memory invariable, the memory is connected to a battery (11) in such a way that even though a cutoff of the electric supply is produced, the code remains stored.

[0063] The receiver (3) is connected to a decoder (12) and this decoder is connected to a comparator (13), which receives in its other inlet the outlet of the encoder (7), in such a way that it compares the emitted code and the received code, and in the event that these codes are not identical it generates an activation signal of a fraudulent handling detecting circuit (14).

[0064] Obviously, the emitted code is not going to coincide with the received code, when the optical fiber (4) is subjected to fraudulent handling, such as cutting of the same.

[0065] The fraudulent handling detector (14) produces a signal to be sent to the optical and/or acoustic indicator (6), indicating fraudulent handling.

[0066] Besides, the fraudulent handling detector (14) can be connected to a voice synthesizer (15) by means of which a spoken message is emitted, a message that is previously recorded in said synthesizer.

[0067] There is also the possibility that the fraudulent handling detector (14) is connected to a radio emitter (16) or to a modem (17), in such a way that when fraudulent handling of the optical fiber (4) is detected, this circumstance is signaled towards a remote place, such as a control center.

[0068] The seal may also have a detector (18) of the opening/closing of the cover or gate for access to the box (1), a detector that is connected to a timer (19), which in turn is connected to a fraudulent handling detector (14) and to the memory (8), these latter two being connected together. Besides, the fraudulent handling detector (14) is connected to a cutoff circuit (20) of the feed of the sealed device, for which purpose the feed of the sealed device passes through the circuit (20).

[0069] This arrangement permits that once the opening of the cover or gate of the box (1) is detected, the fraudulent handling detecting circuit (14) does not take into account the signals from the comparator (13) until the timing time has gone by, in such a way that once said time has gone by the signals from the comparator are verified, in such a way that if the emitted signal and the received signal do not coincide the detector acts on the cutoff circuit (20) of the feed of the sealed device, blocking the operation thereof.

[0070] Besides, if during the timing time the safety code has been introduced, by means of the keyboard (10), the memory (8) produces a signal for the fraudulent handling detector (14) which acts on the cutoff circuit in the following manner:

a) if the cutoff circuit (20) keeps the feed of the sealed device blocked, the detector carries out the deblocking thereof.

b) if the cutoff circuit (20) keeps the sealed device operating, and the safety code is introduced during the timing time, the blocking of the sealed device is prevented.

[0071] Besides, when the sealing of the cover is carried out the seal is not put into operation until the timed time has gone by.

[0072] Likewise, if the cover is opened and closed without the safety code having been introduced, the blocking of the sealed device is produced.

[0073] The cutoff circuit (20) may be defined by a bistable relay controlled by a fraudulent handling detector (14).

[0074] Besides there is an indicator, such as a LED that indicates, once the cover or gate is sealed, when the timing time has gone by, the circuit remaining in operation.

[0075] In the embodiment illustrated in figure 3, the fuel pump (21) has a pump (22) that is connected to a volumetric meter (23), which in turn is connected to an impulse generator (encoder) (24), so that the impulse generator (encoder) (24) provides a signal proportional to the fuel drawn by the pump (22).

[0076] Besides, the fuel pump (21) has an electronic circuit (25) for calculating and displaying the supplied fuel.

[0077] The pump (22) as well as the volumetric meter (23) and the impulse generator (encoder) (24) are housed in a container (26), whose access cover or gate is sealed by means of an optical fiber (4) which is connected to a light emitter (2) and to a light receiver (3) that are included in an independent box (27).

[0078] Likewise, the box (27) is sealed by means of the optical fiber (4) that constitutes a sealing element.

[0079] Just as it has been indicated, the emitter (2) is connected to an encoder (7) which is in turn connected to a memory (8) and to an oscillator (9).

[0080] Likewise, the memory (8) is connected to microswitches or a keyboard (10) and to a battery (11).

[0081] Making reference to that which has been explained above, this structure makes it possible to introduce a code by means of the keyboard (10), a code that is stored in the memory (8) and by means of the

encoder (7), controlled by the oscillator (9), a train of impulses that are emitted by the emitter (2) is produced. Therefore, the impulse train is programmable.

[0082] The code emitted by the emitter (2) is received in the receiver (3) which after decoding in the decoder (12) is sent to the comparator (13), in such a way that it compares the emitted code with the received code, both of them having to be the same, except in the case in which the optical fiber has been fraudulently handled or cut, in which case said codes do not coincide, the comparator (13) producing a signal that is sent to a fraudulent handling detecting circuit (14) that produces a signal indicating that the optical fiber (4) has been fraudulently handled, activating an acoustic and/or optical indicator (6), and showing this incidence on a screen (28).

[0083] Likewise, this signal coming from the fraudulent handling detecting circuit (14) may be sent to a remote control center by means of a modem (17) or a radio transmitter (16).

[0084] Therefore, when the optical fiber (4) is fraudulently handled in order to try to obtain access to the inside of the container (26) or of the box (27), this is duly detected and indicated in the manner described above.

[0085] Besides, the feed of the pump (22) is carried out through the box (27), for which purpose the feed voltage (29) enters the box (21), and by means of some bistable relays (30) it is connected to the pump (22).

[0086] In this way, when the fraudulent handling detector (14) has detected fraudulent handling of the optical fiber (4), the cutoff of the feed of the pump (22) is produced by activation of the bistable relays (30).

[0087] Therefore, the bistable relays (30) define a cutoff/connecting means of the feed of the pump (22).

[0088] In a preferred embodiment, the signal coming from the encoder (24) is delivered to the electronic calculating and display circuit (25) by means of a bistable relay (31) located in the inside of the box (27), in such a way that this relay may likewise be controlled by the fraudulent handling circuit.

[0089] This structure permits the inclusion in the box (27) of a calculating circuit (32) of the supplied fuel and display circuit (33) of said fuel supplied by the pump (22).

[0090] Besides, a digital and analogical input control circuit (34) has been provided for in the box (21), a circuit that receives the signals coming from the calculating and display circuit (25) included in the fuel pump (21). The circuit (32) as well as the circuit (34) are connected to a comparator (35), which compares the value of supplied fuel provided by the equipment itself of the fuel pump (21) and the value calculated by the additional calculating (32) and display (33) circuit of the supply of the fuel, in such a way that if the electronic calculating and display circuit (25) of the fuel pump (21) has been fraudulently handled, the signal provided by the circuit (34) does not coincide with the signal provided by the circuit (32), which is detected by the comparator (35) that produces a signal for the fraudulent handling detecting circuit (36), which activates any of the means (6), (16), (17) or (28), just as it was commented above for the case of the fraudulent handling detecting circuit (14).

[0091] Likewise, the fraudulent handling circuit (36) is connected to relays (30) and (31) in order to carry out the cutoff of the feed of the pump (22) in the event that the fuel supplied does not coincide with the fuel shown on the fuel pump (21).

[0092] A form of fraudulent handling could consist of cutting off the feed of the circuits contained in the box (27), for which purpose the box includes a feed voltage detecting circuit for the pump (22), in such a way that if the feed of the circuits included in the box (27) has been cut off, said detector (37) activates the bistable relays (30) and (31), the fuel pump (21) being blocked.

[0093] Besides, the invention may advantageously include a detector (38) of the opening/closing of the cover or gate for access to the box (21) that is connected to a timer (39), which in turn is connected to the fraudulent handling detector (14) and to the memory (8), these latter two being connected together. Besides, the fraudulent handling detector (14) is connected to the relays (30) and (31), in such a way that this arrangement permits that once the opening of the cover or gate of the box (21) has been detected the fraudulent handling detecting circuit (14) does not take into account the signals of the comparator (9) until the timing time has gone by, in such a way that once said time has gone by it verifies the signals of the comparator, in such a way that if the emitted signal and the received signal do not coincide the detector acts on the relays (30) and (31) blocking the operation of the fuel pump (21).

[0094] This structure makes it possible to introduce a safety code by means of a keyboard (10), the safety code being stored in the memory (8), whereby if during the timing time the safety code is introduced by means of the keyboard (10), the memory (8) produces a signal for the fraudulent handling detector (14) which acts on the cutoff circuit in the following manner:

[0095] If the relays (30) had the feed of the pump (22) cut off, the connection of the feed of the same is carried out.

[0096] If the relays (30) keep the sealed device operating, and the safety code is introduced during the timing time, the cutoff of the feed of the pump (22) is prevented.

[0097] Besides, when the closing of the cover takes place, the circuits included in the box do not start operating until the timed time has gone by.

[0098] Likewise, if the cover is opened and closed without the safety code being introduced, the cutoff of the feed of the pump (22) and of the encoder is produced.

Claims

1. Fuel pump, including a pump (22), a volumetric meter (23) and an impulse generator (24), the impulse generator producing a signal proportional to the supplied fuel; the fuel pump (21) also having first electronic calculating and display means (25) of the supplied fuel, the pump (22) being housed in a container (26) provided with a gate or cover, characterized in that the fuel pump (21) includes an electronic seal including a sealing element (4) for sealing the gate or cover; and:

   - signal emitting means (2) that are connected to the sealing element (4), in such a way that said sealing element (4) constitutes a conducting means of said signal;
   - signal receiving means (3);
   - incorrect reception signaling means; further characterized in that it includes
   - fraudulent handling detecting means of the sealing element (4) according to a signal from the incorrect reception signaling means;
   - cutoff/connecting means of the feed of the pump (22), that cut off the feed thereof upon detecting fraudulent handling of the sealing element (4);
   - the impulse generator (24) of the fuel pump (21) being connected to second electronic calculating and display means of the supplied fuel, which are sealed by the sealing element (4).

2. Fuel pump, according to claim 1, characterized in that the incorrect reception signaling means are defined by means detecting the absence of a signal in reception.

3. Fuel pump, according to claim 1, characterized in that the incorrect reception signaling means are basically defined by a comparator (13) that compares the emitted signal with the received signal in such a way that if both signals do not coincide, it produces an incorrect reception signal.

4. Fuel pump, according to any of the preceding claims, characterized in that the emitting means are defined by a light emitter (2), the sealing element is an optical fiber (4), and the receiving means are defined by a light receiver (3).

5. Fuel pump, according to any of claims 1 to 3, characterized in that the emitting means are defined by an electric emitter, the sealing element is an electric conductor and the receiving means are defined by an electric receiver.

6. Fuel pump, according to claim 1, characterized in that the incorrect reception signaling means include optical and/or acoustic indicators (6).

7. Fuel pump, according to claim 1, characterized in that the incorrect reception signaling means are connected to a modem (17) or to a radio emitter (16) in order to send the signal to a remote place.

8. Fuel pump, according to claim 1, characterized in that the signal emitting means are connected to a programmable pulse train generator.

9. Fuel pump, according to claim 1, characterized in that:

   - the emitting (2) and receiving (3) means are included in the sealed container (26) and/or in an independent box (27) also sealed by the sealing element;
   - the second electronic calculating and display means of the supplied fuel are included in the sealed container or in the sealed independent box.

10. Fuel pump, according to claim 1, characterized in that it has means (38) for detecting the opening/closing of the gate or cover for access to a box (27) that contains the seal, means that are connected to a timer (39) in order to activate the cutoff means of the feed of the pump (22), once a timed time from the detection of the opening of the cover or gate has gone by, and in order to connect the feed of the pump (22) after closing of the gate or cover once the timed time has gone by.

11. Fuel pump, according to claim 10, characterized in that it has means (8) for introducing and storing a code, means that are connected to the cutoff/connecting means of the feed of the sealed pump (22), in such a way that if the code introduced by means of a keyboard (10) coincides with the stored code during the course of timed time, it prevents the cutoff of the feed of the sealed pump (22) or the connecting of the feed of the sealed pump is produced, if this pump was disconnected.

12. Fuel pump, according to claim 11, characterized in that it has means for cutting off the feed of the sealed pump (22), upon detecting the opening and closing of the gate or cover without the code having been introduced.

13. Fuel pump, according to any of the preceding claims, characterized in that the cutoff/connecting means of the feed of the pump (22) are defined by a bistable relay (30).

14. Fuel pump, according to claim 1, characterized in that the two calculating and display means of the

supplied fuel are connected to comparing means (35) and the latter to some fraudulent handling detecting means (36) in such a way that the latter act on the cutoff/connecting means of the pump (22) when the calculation of the fuel made by both means does not coincide.

15. Fuel pump, according to claim 1, characterized in that it has means (37) to detect when the feed of the box is produced, in such a way that upon making said detection, if there is no feed in the different elements contained in the box (27) it acts on the relay (30) cutting off the feed of the pump; it being provided for that in the box (27) there is a battery (11) that maintains the operating state of the elements included in the box (27).

16. Fuel pump, according to any of the preceding claims, characterized in that there is a second impulse generator by means of which the operating of the impulse generator (24) provided for in the fuel pump (21) is verified.

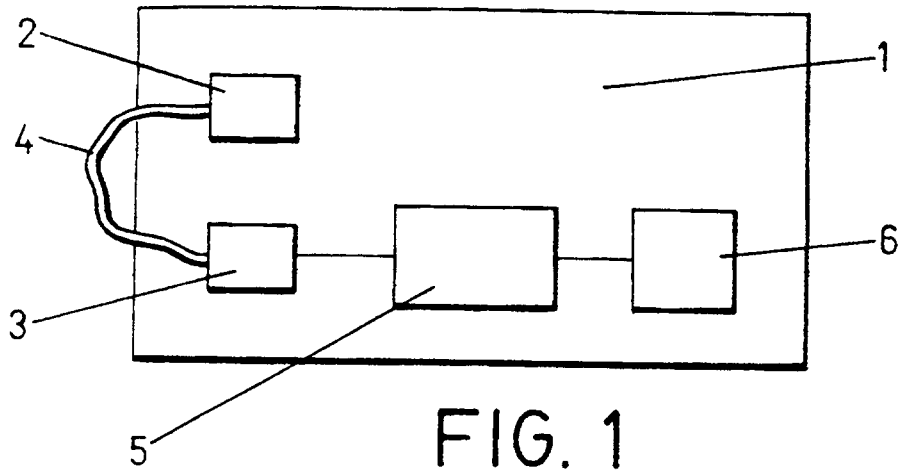

FIG. 1

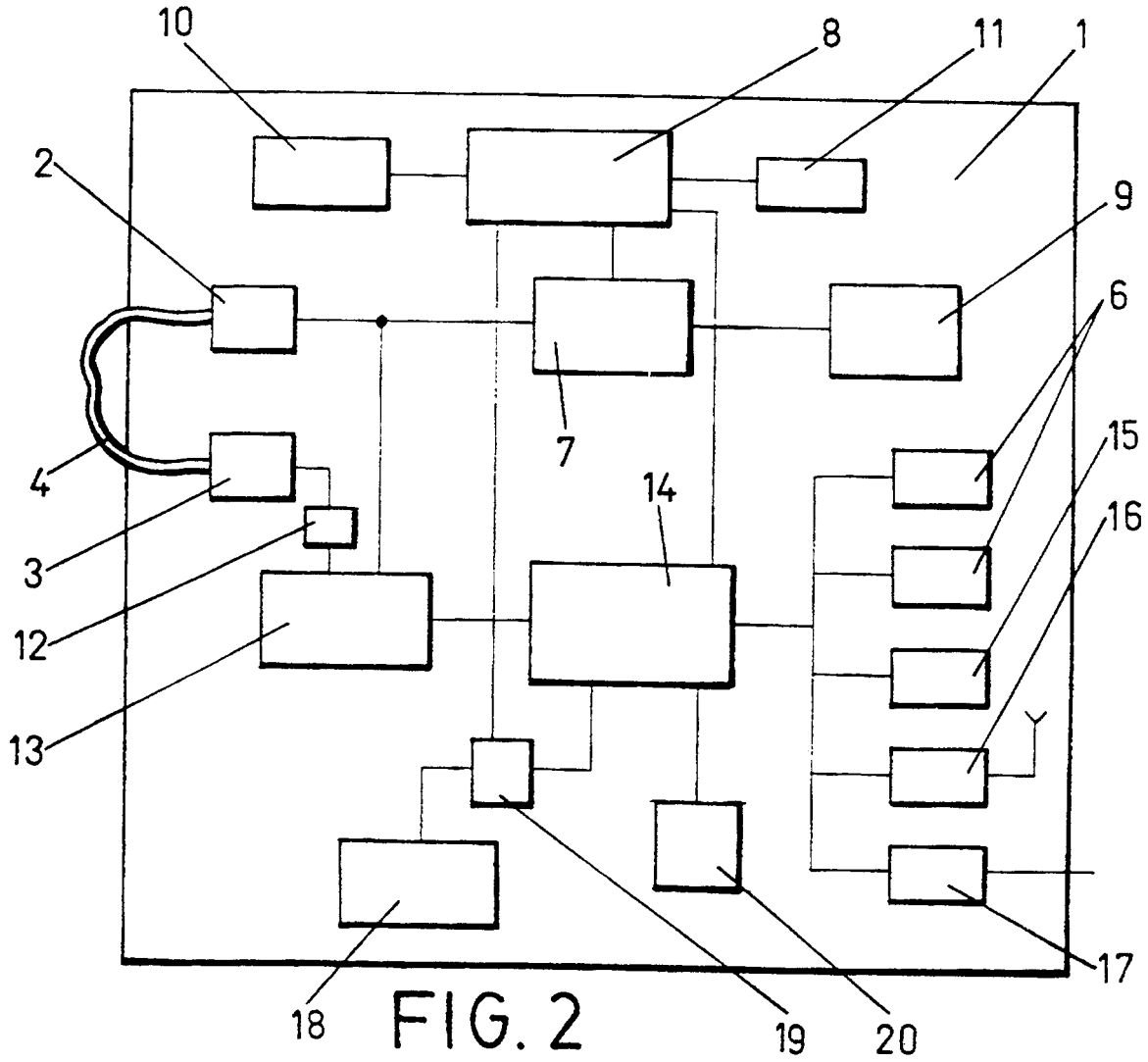

FIG. 2

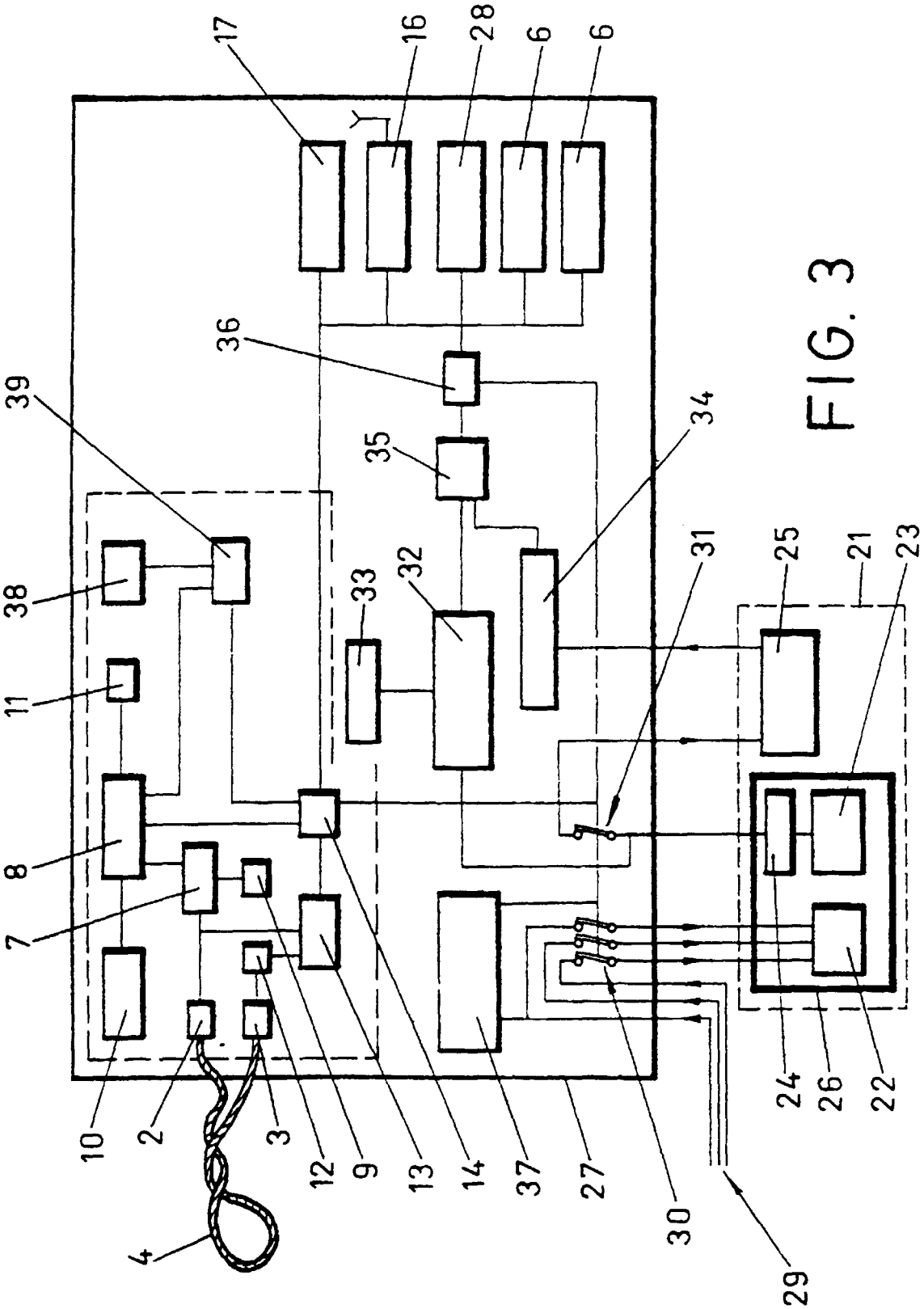
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FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 99 /00122

A. CLASSIFICATION OF SUBJECT MATTER
IPC6 : G09F 3/03, G08B 13/22, B67D 5/33
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 : G09F, G08B, B67D

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 practical, search terms used)
DWPI, EPODOC, CIBEPAT.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	WO 9007759 A1 (BATTELLE MEMORIAL INSTITUTE) 12 July 1990 (12.07.90) the whole document	1-3, 5. 7, 8,13 4, 15-17 10, 11,19, 22, 23
X Y	US 4571691 A1 (KENNON) 18 February 1986 (18.02.86) Column 1. Line 42 - column 2, line 2 ; column 3, line 16 – column 4, line 22.	1,2,7,14 4
Y	BASE DE DATOS DWPI, n° acceso 98-205937, 1998, Derwent Publ. Ltd.Londres, GB & SE 9602435 A (B. FAELTH) 21 December 1997 (21.12.97) abstract	15-17
X	US 4982985 A1 (ATLAS) 08 January 1991 (08.01.91) Column 4, line 35 – column 5, line 2	1- 4, 6,7
X	US 5111184 A1 (HEATON et al.) 05. May 1992 (05.05. 92) The whole document	1, 4, 6, 7
X A	EP 0463294 A1 (A. STOBBE) 02 January 1992 (02. 01. 92) abstract	1,5 8

☐ Further documents are listed in the continuation of box C. ☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 July 1999 (21.07.99)	06 September 1999 (06.09. 99)
Name and mailing address of the ISA/ European Patent Office	Authorized officer Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ ES 99/00122

Patent document cited in search report	Publication date	Patent familiy member(s)	Publication date
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