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(54) **Anti-theft device**

Diebstahlschutzvorrichtung

Dispositif antivol

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Description

Field of the invention

[0001] The present invention relates to a fuel dispensing unit for filling the tank of a vehicle with fuel, the fuel dispensing unit being connected to a current source having an earth fault breaker, and comprising at least one tamper/damage-detecting sensor.

Background Art

[0002] Various techniques, such as the one disclosed in EP-A-1 077 440, are available on the market to protect fuel dispensing units in case of burglary and other tampering for the purpose of stealing fuel. An example of such a technique is an anti-theft system with some kind of tamper/damage-detecting sensor, which breaks a switch which thus gives or breaks a signal between the fuel dispensing unit and a central unit which then loses contact with the fuel dispensing unit. The loss of this contact initiates some kind of alarm and inactivates the fuel dispensing unit, which serves to prevent use of the fuel dispensing unit. Inactivation involves, for instance, setting a logic variable in the control system of the pump at a certain value so that that pumping is not allowed or, in a mechanical control system, activating a mechanical stop which physically prevents pumping.

[0003] A drawback of the above-described anti-theft system is that it can relatively easily be tampered with so as to allow theft of fuel. By existing components being bypassed, joined with tape, broken to pieces or replaced with other components, the fuel dispensing unit can be started so that theft of fuel can take place. A further problem is that the system can be tampered with so as to be reset and thus not indicate that undue use has been made.

Summary of the invention

[0004] The object of the present invention is to provide a fuel dispensing unit with an improved anti-theft system in relation to prior art, which is easily mounted and makes unlawful pumping of fuel difficult

[0005] According to the invention, this object is achieved by a fuel dispensing unit which has the features as defined in claim 1, preferred embodiments being stated in dependent claims 2-10.

[0006] The new fuel dispensing unit is thus provided with a sensor-activated system, which causes a leakage current to release the earth fault breaker of the fuel dispensing unit current source. The fuel dispensing unit provided according to the invention is extremely advantageous by being put in a dead state owing to the fact that the external power supply ceases when one or more sensors detect that the fuel dispensing unit is opened, broken up or being exposed by some other kind of tampering.

[0007] In a preferred embodiment, the use of a com-

bination of several light, pressure, magnetic, vibration, voltage, motion and/or mechanical sensors makes it very difficult to avoid interruption of the external power supply in case of undue breaking up of the fuel dispensing unit.

[0008] Each fuel dispensing unit is suitably arranged with a data storage unit which saves information if and when the external power supply is interrupted so as to make it still more difficult for undue use to pass unnoticed.

[0009] In a variant of the invention, the leakage current causing system is provided with an indicator for faulty connection of the system, and in another variant the system is provided with an indicator to indicate that the system is not switched on. Both variants facilitate correct mounting, after-equipment and/or service of the fuel dispensing unit.

[0010] The leakage current causing system is preferably arranged internally in the fuel dispensing unit for easy mounting and provides by its construction cost-effective protection which is also easy to arrange later on existing equipment.

[0011] By suitably providing the fuel dispensing unit with a voltage monitor, power failure is detected, which then allows one or more external alarms to be switched on and possibly call in security staff, service staff etc.

[0012] Another advantageous effect of the invention is that it also provides current carrying protection for, for instance, vehicles bumping into the fuel dispensing unit or for service staff forgetting to switch off the voltage. The invention makes it difficult to deform or open the fuel dispensing unit without the external current supply being switched off.

Brief Description of the Drawing

[0013] The invention will now be described in more detail with reference to the accompanying drawing which by way of example illustrates a currently preferred embodiment of the invention.

[0014] Fig. 1 is a schematic view of the principle of the invention.

Description of Preferred Embodiments

[0015] The fuel dispensing unit 1 shown in Fig. 1 for filling the tank of a vehicle with fuel is connected to a power source 2 having an earth fault breaker and comprises at least one sensor 3 which indicates some kind of tampering with the fuel dispensing unit 1. Examples of tampering can be breaking up or boring through the housing of the fuel dispensing unit, breaking the connection between the fuel dispensing unit and its central unit etc. A first circuit 4 is arranged inside the fuel dispensing unit 1 and connected between a phase conductor P and a protective earthing conductor PE and comprises a switch 7, which can be, for example, a magnetic sensor, and a resistor 8 connected in series. The first circuit 4 is usually designed to conduct a current (leakage current) greater than 30mA.

[0016] A second circuit 9 is connected between earth 10 and a voltage unit 11 in the fuel dispensing unit 1 and comprises, connected in series, a switch 12 and a relay 13 which controls closing and opening of the switch 7 in the first circuit 4. The switch 12 is closed by means of the sensor 3. In the preferred embodiment, the switch 12 is connected in parallel with other switches which are each controlled by a combination of other sensors, such as light, pressure, magnetic, vibration, voltage, motion and/or mechanical sensors.

[0017] A detector 14 is connected to the sensor 3 and detects and in some known way produces a Signal if the sensor 3 is not activated or if the second circuit 9 is not connected to the voltage unit 11. An example of an effect of such a produced signal is the switched-off display lighting of the fuel dispensing unit. Arranged inside the fuel dispensing unit are on the one hand a data storage unit 15 which stores data if and when voltage failure over the fuel dispensing unit occurs and, on the other, a voltage monitor 16 which in case of voltage failure emits a signal to, for instance, an alarm.

[0018] Connected to the first circuit 4 is a circuit which detects and indicates with a light-emitting diode if the first circuit is not correctly mounted on the conductors P and PE of the current source 2.

[0019] With a fuel dispensing unit according to the preferred embodiment, a sensor is activated, for instance, when breaking up the outer housing of the fuel dispensing unit. Then the sensor closes the second circuit, which causes the first circuit to be closed, which in turn produces leakage current between the phase conductor and the protective earthing conductor, which are arranged between the current source and the fuel dispensing unit. When the leakage current arises, the current source interrupts the current supply, which makes it impossible to dispense fuel from the fuel dispensing unit.

[0020] A variant of the invention is to control the switch 12 by a combination of several different types of sensors, such as light, pressure, magnetic, vibration, voltage, motion and/or mechanical sensors. A further variant of the invention is that the first circuit 4 conducts current from the phase conductor P in a manner different from that described and causes a difference, usually greater than 30mA, between the electric currents of the phase conductor and the neutral conductor.

[0021] Finally it should be emphasised that the invention can be applied to protect many different types of devices supplied with voltage.

Claims

1. A fuel dispensing unit with an anti-theft system, comprising a fuel dispensing unit (1) for filling the tank of a vehicle with fuel and a current source (2), said current source (2) being connected to the fuel dispensing unit and having an earth fault breaker, and said fuel dispensing unit comprising at least one sensor

(3) which detects tampering with or damage so the fuel dispensing unit, **characterised in that** the sensor (3) is arranged to activate by its sensor signal, an electrical system arranged to generate a leakage current to release the earth fault breaker of the current source.

2. A fuel dispensing unit as claimed in claim 1, **characterised in that** the sensor (3) is a light, pressure, magnetic, vibration, voltage, motion and/or mechanical sensor.

3. A fuel dispensing unit as claimed in claim 1 or 2, **characterised in that** the fuel dispensing unit comprises a data storage unit (15) for the earth fault release data of the fuel dispensing unit.

4. A fuel dispensing unit as claimed in any one of claims 1-3, **characterised in that** the fuel dispensing unit comprises a detector (14) arranged to detect an inactive sensor and, in case of sensor inactivity, indicate this.

5. A fuel dispensing unit as claimed in claim 4, **characterised in that** the detector is arranged for indication by means of switched-off fuel dispensing unit display lighting.

6. A fuel dispensing unit as claimed in any one of claims 1-5, **characterised in that** the leakage current causing system comprises an indicator for incorrect installation of the system.

7. A fuel dispensing unit as claimed in any one of claims 1-6, **characterised in that** the leakage current causing system is arranged inside the fuel dispensing unit.

8. A fuel dispensing unit as claimed in any one of claims 1-7, **characterised in that** the leakage current causing system comprises a first electrical circuit (4) with a switch (7) and a resistor (8) which are connected in series between at least one phase conductor (P) and a protective earthing conductor (PE), and a second electrical circuit (9) with a switch (12) which is controlled by means of said sensor (3) and connected in series with a relay (13) arranged to close the switch (7) in the first circuit (4) when carrying current, the second circuit (9) being connected between a current source (11) and an earth conductor (10) arranged inside the fuel dispensing unit.

9. A fuel dispensing unit as claimed in claim 8, **characterised in that** the fuel dispensing unit comprises a plurality of tamper/damage-detecting sensors, and the second electrical circuit (9) comprises

a corresponding number of switches connected in parallel and controlled by means of said sensors.

10. A fuel dispensing unit as claimed in any one of claims 1-9,
characterised in that the fuel dispensing unit comprises a voltage monitor (16) arranged to give a signal in case of power failure over the fuel dispensing unit.

Patentansprüche

1. Zapfanlage für Kraftstoff mit Diebstahisicherung, umfassend eine Zapfsäule für Kraftstoff (1) zum Auffüllen des Tanks eines Kraftfahrzeugs mit Kraftstoff und eine Stromquelle (2), wobei die Stromquelle (2) mit der Zapfsäule für Kraftstoff verbunden ist und einen Erdschlussunterbrecher aufweist und die Zapfsäule für Kraftstoff wenigstens einen Sensor (3) umfasst, der das unbefugte Hantieren mit oder Beschädigungen an der Zapfsäule für Kraftstoff erfasst, **dadurch gekennzeichnet, dass** der Sensor (3) dazu eingerichtet ist, durch sein Sensorsignal eine elektrische Anlage zu aktivieren, die dazu eingerichtet ist, einen Leckstrom zu erzeugen, um den Erdschlussunterbrecher der Stromquelle auszulösen.
2. Zapfanlage für Kraftstoff nach Anspruch 1, **dadurch gekennzeichnet, dass** der Sensor (3) ein Licht-Druck-, magnetischer, Schwingungs- Spannungsbewegungs- und/oder mechanischer Sensor ist.
3. Zapfanlage für Kraftstoff nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Zapfanlage für Kraftstoff einen Datenspeicher (15) für die Daten über den Erdschlussauslöser der Zapfanlage für Kraftstoff umfasst.
4. Zapfanlage für Kraftstoff nach einem der Ansprüche bis 3, **dadurch gekennzeichnet, dass** die Zapfanlage für Kraftstoff einen Detektor (14) umfasst, der dazu eingerichtet ist, einen inaktiven Sensor zu erfassen und dieses im Falle der Inaktivität des Sensors, anzuzeigen.
5. Zapfanlage für Kraftstoff nach Anspruch 4, **dadurch gekennzeichnet, dass** der Detektor mit Hilfe einer Anzeisebeleuchtung der abgeschalteten Zapfanlage für Kraftstoff als Anzeige eingerichtet ist.
6. Zapfanlage für Kraftstoff nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die einen Leckstrom verursachende Anlage einen Anzeiger für eine fehlerhafte installation der Anlage umfasse
7. Zapfanlage für Kraftstoff nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** die Leck-

strom verursachende Anlage innerhalb der Zapfanlage für Kraftstoff eingerichtet ist

8. Zapfanlage für Kraftstoff nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** die Leckstrom verursachende Anlage einen ersten elektrischen Schaltkreis (4) mit einem Schalter (7) und einem Widerstand (8), die in Reihe zwischen wenigstens einem Phasenleiter (P) und einem Schutzleiter (PE) geschaltet sind, und einen zweiten elektrischen Schaltkreis (9) mit einem Schalter (12), der mit Hilfe des Sensors (3) gesteuert wird und in Reihe mit einem Relais (13), das so eingerichtet ist, dass es mit dem Schalter (7) in dem ersten Schaltkreis (4), wenn dieser Strom, führt, schließt, umfasst, wobei der zweite Schaltkreis (9) zwischen einer Stromquelle (11) und einem Erdleiter (10), der innerhalb der Zapfanlage für Kraftstoff eingerichtet ist, geschaltet ist.
9. Zapfanlage für Kraftstoff nach Anspruch 8, **dadurch gekennzeichnet, dass** die Zapfanlage für Kraftstoff eine Vielzahl von unbefugtes Hantieren / Beschädigungen erfassenden Sensoren umfasst und der zweite, elektrische Schaltkreis (9) eine entsprechende Anzahl an Schaltern umfasst, die parallel geschaltet sind und mit Hilfe der Sensoren gesteuert werden.
10. Zapfanlage für Kraftstoff nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** die Zapfanlage für Kraftstoff einen Spannungswächter (16) umfasst, der dazu eingerichtet ist, im Falle eines Stromausfalls an der Zapfanlage für Kraftstoff ein Signal auszugeben.

Revendications

1. Unité de distribution de carburant comprenant un système antivol, comprenant une unité de distribution de carburant (1) destinée à remplir le réservoir d'un véhicule avec du carburant et une source de courant (2), ladite source de courant (2) étant raccordée à l'unité de distribution de carburant et présentant un disjoncteur de défaut à la terre, et ladite unité de distribution de carburant comprenant au moins un capteur (3) qui détecte un fonctionnement intempestif avec ou des dommages sur l'unité de distribution de carburant, **caractérisée en ce que** le capteur (3) est agencé pour activer, par son signal de capteur, un système électrique agencé pour générer un coupant de fuite pour libérer le disjoncteur de défaut à la terre de la source de courant.
2. Unité de distribution de carburant selon la revendication 1, **caractérisée en ce que** le capteur (3) est un capteur de lumière, de pression, magnétique, de vibration,

de tension, de mouvement et/ou mécanique.

3. Unité de distribution de carburant selon la revendication 1 ou 2,
caractérisée en ce que l'unité de distribution de carburant comprend une unité de stockage de données (15) pour les données de libération de défaut à la terre de l'unité de distribution de carburant. 5
4. Unité de distribution de carburant selon l'une quelconque des revendications 1 à 3,
caractérisée en ce que l'unité de distribution de carburant comprend un détecteur (14) agencé pour détecter un capteur inactif et, en cas d'inactivité du capteur, l'indiquer. 10 15
5. Unité de distribution de carburant selon la revendication 4,
caractérisée en ce que le détecteur est agencé pour l'indication au moyen d'un éclairage d'affichage d'unité de distribution de carburant éteint. 20
6. Unité de distribution de carburant selon l'une quelconque des revendications 1 à 5,
caractérisée en ce que le système provoquant un courant de fuite comprend un indicateur d'installation incorrecte du système. 25
7. Unité de distribution de carburant selon l'une quelconque des revendications 1 à 6,
caractérisée en ce que le système provoquant le courant de fuite est agencé à l'intérieur de l'unité de distribution de carburant. 30
8. Unité de distribution de carburant selon l'une quelconque des revendications 1 à 7,
caractérisée en ce que le système provoquant le courant de fuite comprend un premier circuit électrique (4) doté d'un commutateur (7) et d'une résistance (8) qui sont connectés en série entre au moins un conducteur de phase (P) et un conducteur de terre protecteur (PE), et un second circuit électrique (9) doté d'un commutateur (12) qui est commandé au moyen dudit capteur (3) et connecté en série à un relais (13) agencé pour fermer le commutateur (7) dans le premier circuit (4) lorsqu'il porte du courant, le second circuit (9) étant connecté entre une source de courant (11) et un conducteur de terre (10) agencé à l'intérieur de l'unité de distribution de carburant. 35 40 45 50
9. Unité de distribution de carburant selon la revendication 8,
caractérisée en ce que l'unité de distribution de carburant comprend une pluralité de capteurs, détectant un fonctionnement intempestif/une détérioration, et le second circuit électrique (9) comprend un nombre correspondant de commutateurs con-

nectés en parallèle et commandés au moyen desdits capteurs.

10. Unité de distribution de carburant selon l'une quelconque des revendications 1 à 9,
caractérisée en ce que l'unité de distribution de carburant comprend un moniteur de tension (16) agencé pour délivrer un signal en cas de panne de l'unité de distribution de carburant.

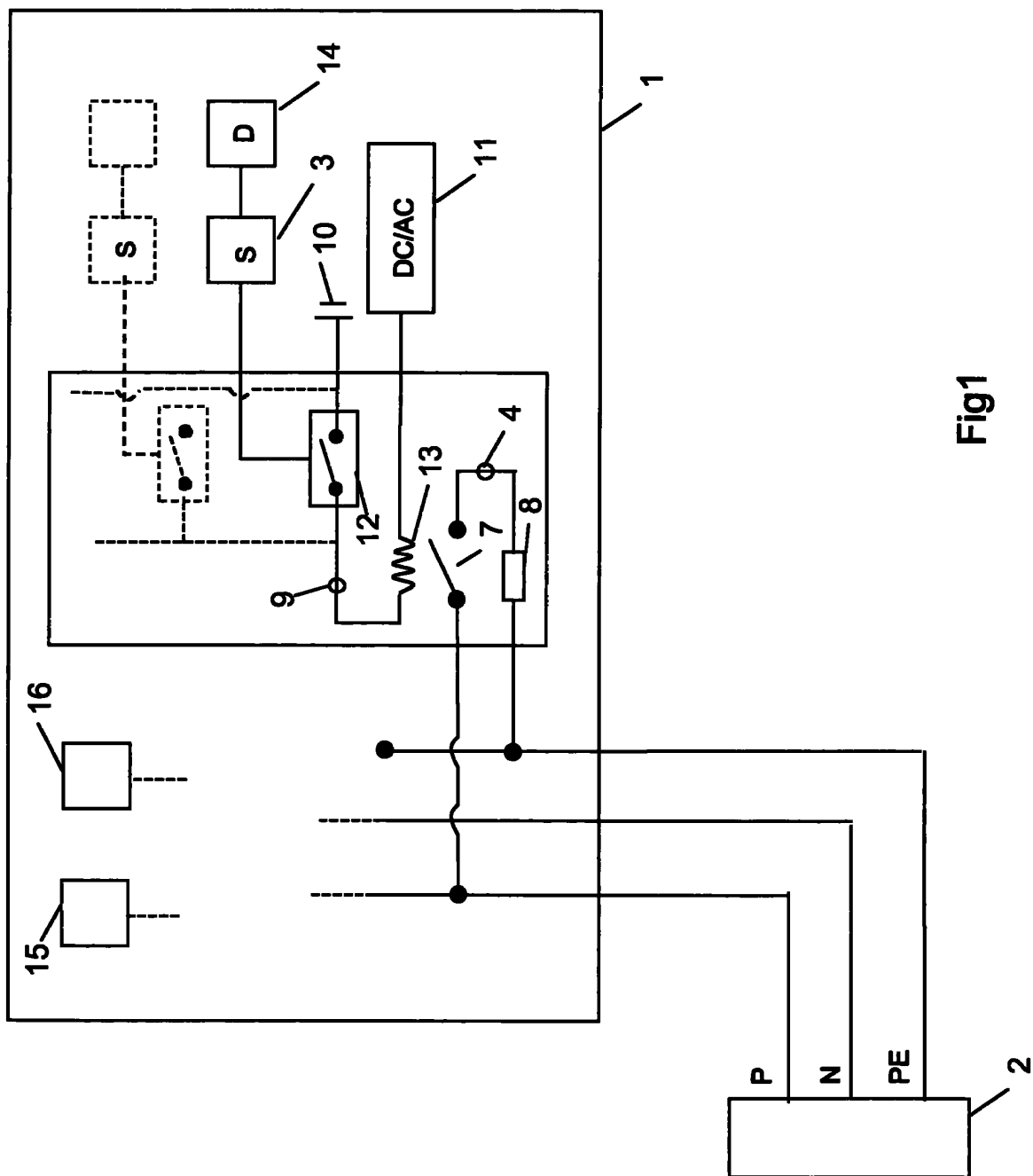


Fig1

REFERENCES CITED IN THE DESCRIPTION

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