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(54) **FUEL DISPENSER WITH AN RFID IDENTIFIABLE FUEL NOZZLE**

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Description

Technical field

[0001] The invention relates to a fuel dispenser for refuelling vehicles comprising means for detecting each nozzle individually on its nozzle boot.

Background art

[0002] Fuel dispensers usually comprise several pumping units intended to deliver several kinds of fuel. Each pumping unit is connected to one or more nozzle(s) delivering the fuel to vehicle tanks. Several nozzle boots are provided in the fuel dispenser enabling each to hold a nozzle.

[0003] As disclosed by the document EP1995210, it is known to use magnetic switches for detecting if the nozzle is placed in the nozzle boot (inactive) or removed from the nozzle boot (in use to fill a vehicle or a receptacle). A magnet is provided in the nozzle guard and a magnetic sensor is provided in the nozzle boot, feeding the electronics with the status of such nozzle in boot or not. Each magnetic switch is electrically connected to an electronic control device located in the electronic compartment. The electronic control device detects if the nozzle is lifted from the nozzle boot to start the fuel pumping unit associated to the nozzle for a refuelling operation or if the nozzle is hung up on the nozzle boot to stop the fuel pumping unit after a refuelling operation.

[0004] However, the use of magnetic switches requires lots of wiring arrangements and wire routing due to the great number of associated electric cables (one for each boot). Each cable comprises two or three wires, thus involving as many connections.

[0005] For instance, a fuel dispenser having three nozzles per side requires a total of six nozzles. This involves six nozzle switch cables, involving twelve to eighteen electric wires, six inputs and six outputs on the electronic board, and protective ground wires, leading to a complex and costly arrangement.

[0006] Another issue with magnetic switches is that it needs anti explosive (ATEX) effort. Each switch is certified on its own, but the cable needs to be routed across a vapor barrier, the adequate arrangement to prevent dangerous vapors from ingressing the electronic compartment (comprising the calculator and electronic boards) coming from the hose/nozzle/pump compartment comprising hose managing system and hydraulics. The great number of electric wires and cables leads to a complex assembly and costly vapor barriers. The manufacturing time is also important as each cable needs to be routed separately and secured to prevent vapors passing.

[0007] It leads to another issue with the manufacturing process. For simplifying the logistic process, same magnetic sensors having the same electric cable length are bought for all the nozzle boots whatever the position of the nozzle boot on the fuel dispenser. The magnetic

sensor located farthest from the electronic compartment needs to have a long electric cable. As a result, all the magnetic sensors have initially the same long electric cable. That means that the magnetic sensor located in the fuel dispenser far from the electronic compartment has an ideal electric cable length that does not need to be cut.

[0008] On the other hand, the magnetic sensor located closest to the electronic compartment has too much length of electric cable and needs to be cut, as it is better to adjust the cable length than to keep long electric cables that are difficult to route, and as electric wire loops need to be avoided for reducing risk of electromagnetic disturbance.

[0009] As a result, each magnetic sensor cable is adjusted, leading to an important waste of electric cable while costly on labour. Finally, only one magnetic sensor has an electric cable with the perfect length for its use.

[0010] That also leads to unwanted cost and environmental issues (cables are WEEE directive waste).

[0011] As a further state of the art, document EP 2 939 950 discloses a fuel dispenser for refuelling vehicles whose fuelling nozzle is foreseen with an RFID tag reader. The vehicle is equipped with an RFID tag in which fuel related information such as the fuel type required by the vehicle, is stored. Only if the required fuel type is identical to the fuel type delivered by the nozzle, the refuelling of the vehicle is started.

Summary of the invention

[0012] It is an objective of the present invention to mitigate, alleviate or eliminate one or more of the above-identified deficiencies in the art and disadvantages singly or in any combination and solve at least the above-mentioned problems.

[0013] According to a first aspect of the invention, these and other objects are achieved, in full or at least in part, by a fuel dispenser for refuelling vehicles comprising a control unit connected to a microcontroller. The fuel dispenser is characterised by comprising at least one antenna connected to the microcontroller and configured to detect a signal from at least a RFID tag located on a component of the dispenser. The microcontroller is adapted to store a unique identifier associated to the RFID tag and to read the signal of the RFID tag for identifying the component and/or the position of the component with respect to the antenna.

[0014] The use of RFID tag in a nozzle is already known in order to communicate with an active tag detecting device located in a vehicle to prevent misfuelling.

[0015] However, prior art does not disclose an antenna located on or near a nozzle boot in communication with an RFID transponder on a nozzle for detecting the presence of the nozzle on the nozzle boot in order to start or stop the fuel pumping unit before or after a fuel transaction. Such an arrangement with a single conductive cable forming loops around nozzles boot is not currently

known.

[0016] An advantage of the invention is to combine misfuelling detection of prior art with nozzle detection of the invention. Indeed, RFID tags in the nozzles could be used in interaction with the vehicle for misfuelling detection and with the dispenser for detection the position of the nozzle in a very interesting cost-effective manner (RFID tag used for 2 functions).

[0017] The antenna may be configured to detect the lifting of the at least one fuel nozzle from the nozzle boot at the beginning of a refuelling operation, and the microcontroller is adapted to read the signal detected by the antenna for identifying the RFID tag, and to send a signal to the control unit for starting a pumping unit of the fuel dispenser.

[0018] The fuel dispenser may comprise one antenna per nozzle boot that is configured to detect a signal from only one RFID tag fixed on a fuel nozzle, the antenna being located on or near the nozzle boot.

[0019] The fuel dispenser may comprise an induction device comprising a single conductive cable comprising an input and an output connected to the microcontroller, the conductive cable being arranged such as to form the antenna on or near each nozzle boot.

[0020] The conductive cable may be arranged in loops around each nozzle boot.

[0021] Each nozzle boot may comprise a recess on its back face in which the antenna is inserted.

[0022] The antenna may be embedded inside each nozzle boot.

[0023] According to a first embodiment, the fuel dispenser may further comprise a first side with a first raw of nozzle boots intended to support fuel nozzles dedicated to deliver several kinds of fuels, a second side with a second raw of nozzle boots intended to support fuel nozzles dedicated to deliver several kinds of fuels.

[0024] The fuel dispenser comprises a first induction device including a first conductive cable arranged such as to form several antennas on or near the nozzle boots of the first raw of nozzle boots. The first conductive cable comprises a first input and a first output connected to the microcontroller.

[0025] The fuel dispenser comprises a second induction device including a second conductive cable arranged such as to form several antennas on or near the nozzle boots of the second raw of nozzle boots. The second conductive cable comprises a second input and a second output connected to the microcontroller.

[0026] The advantage is to provide two independent induction devices. If one fails, it will not disturb the other induction device.

[0027] According to a second embodiment, the fuel dispenser may further comprise a first side with a first raw of nozzle boots intended to support fuel nozzles dedicated to deliver several kinds of fuels, a second side with a second raw of nozzle boots intended to support fuel nozzles dedicated to deliver several kinds of fuels, and a unique induction device including a single conductive

cable arranged such as to form several antennas on or near the nozzle boots of the first raw and the second raw of nozzle boots. The unique conductive cable comprises an input and an output connected to the microcontroller.

[0028] The advantage is to provide a simplest and less costly arrangement than proposed in the first embodiment.

[0029] The fuel dispenser may comprise a single antenna configured to detect several RFID tags. It provides a very simple arrangement with minimum of components.

[0030] The fuel nozzle may comprise a handle protected with a plastic skirt, the RFID tag being located in the plastic skirt.

[0031] The microcontroller may comprise means for measuring the distance between the antenna and the RFID tag.

[0032] According to a second aspect of the invention, these and other objects, and/or advantages that will be apparent from the following description of embodiments, are achieved, in full or at least in part, by a method for detecting a component of a fuel dispenser, comprising detecting a signal from at least a RFID tag located on the component, reading the signal of the RFID tag, and comparing the signal of the RFID tag with a unique identifier associated to the RFID tag to identify the component and/or the position of the component.

[0033] Effects and features of the second aspect of the present invention are largely analogous to those described above in connection with the first aspect of the inventive concept. Embodiments mentioned in relation to the first aspect of the present invention are largely compatible with the further aspects of the invention.

[0034] Other objectives, features and advantages of the present invention will appear from the following detailed disclosure, from the attached claims, as well as from the drawings. It is noted that the invention relates to all possible combinations of features.

[0035] Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the [element, device, component, means, step, etc.]" are to be interpreted openly as referring to at least one instance of the element, device, component, means, step, etc., unless explicitly stated otherwise.

[0036] As used herein, the term "comprising" and variations of that term are not intended to exclude other additives, components, integers or steps.

Brief description of the drawings

[0037] The above, as well as additional objects, features and advantages of the present invention, will be better understood through the following illustrative and non-limiting detailed description of embodiments of the present invention, with reference to the appended drawings, where the same reference numerals may be used for similar elements, and wherein:

Fig. 1 is a front view of one exemplary embodiment of a fuel dispenser according to a first aspect of the invention.

Fig. 2 is a top view of selected parts of another exemplary embodiment of the fuel dispenser according to the first aspect of the invention.

Fig. 3 is a top view of selected parts of another exemplary embodiment of the fuel dispenser according to the first aspect of the invention.

Fig. 4 is a top view of selected parts of another exemplary embodiment of the fuel dispenser according to the first aspect of the invention.

Fig. 5 is a top view of selected parts of another exemplary embodiment of the fuel dispenser according to the first aspect of the invention.

Fig. 6 is a top view of one exemplary embodiment of a fuel dispenser according to a second aspect of the invention.

Detailed description of preferred embodiments of the invention

[0038] Fig. 1 illustrates an exemplary embodiment of a fuel dispenser 1. The fuel dispenser 1 comprises two fuel lines 15 including each a fuel pump 8 for generating a stream of fuel entering a respective fuel flow meter 16. Each fuel flow meter 16 is connected to a respective flexible fuel hose 17 that is also connected to a fuel nozzle 4 for dispensing fuel into a tank of a vehicle (not shown).

[0039] Each pump 8 of the fuel lines 15 draws fuel from two distinctive fuel tanks comprising two different kind of fuels (not shown).

[0040] The fuel dispenser 1 comprises a hydraulic compartment 18 wherein are located the two pumps 8 and the two fuel flow meters 16.

[0041] The fuel dispenser 1 comprises a hose management compartment 19 wherein the flexible fuel hoses 17 are stored in idle position, when there is no refuelling operation.

[0042] The hose management compartment 19 comprises at least a front panel 21 supporting at least a nozzle boot 5.

[0043] The example of figure 1 shows only a first row 13 of nozzle boots 5 intended to support fuel nozzles 4 dedicated to deliver several kinds of fuels. According to a preferred embodiment, the hose management compartment 19 comprises also a second side with a second row 14 of nozzle boots 5 intended to support fuel nozzles 4 dedicated to deliver several kinds of fuels, two nozzle boots 5 are also fixed to the another front panel (not shown).

[0044] When the fuel dispenser 1 is not operated, each fuel nozzle 4 rests in a respective nozzle boot 5 (at an idle position).

[0045] The fuel dispenser 1 comprises an electronic compartment 20. A control unit 2 connected to a microcontroller 3 is arranged inside the electronic compartment 20. The control unit 2 is connected to the two motors

8 via two communication lines 22 enabling to control the motors 8 and supply electrical energy to them.

[0046] The control unit 2 is also connected to the fuel meters 16 and receives from the fuel meters 16 signals representative of an amount fuel dispensed at the fuel nozzles 6. The control unit 2 has a conventional, suitable processor and a memory.

[0047] Since certain electric voltages are present in the control unit 2, the communication lines 22 comprises an EExi barrier device (not shown) which may be arranged between the control unit 19 and the fuel meters 16 in order to provide explosion protection for flammable fuel present in, for example, the fuel meters 16. The EExi barrier device is preferably an electronic device having a protective function in potentially explosive atmospheres, and its technical requirements are stipulated in Directive 94/9/EC (ATEX). The EExi barrier device may also be a barrier device according to CENELEC standards, or according to any other suitable standard for providing the required protection. Instead of an EExi barrier device, an EExd, EExp, EExn or EExm barrier device may be used, or any other device providing similar functionality. In brief, the barrier device is intrinsically safe by ensuring that electric current and voltage levels are reduced in the electric components that are arranged where fuel vapour is more common.

[0048] According to the invention, the fuel dispenser 1 comprises at least an antenna 7 connected to the microcontroller 3 and configured to detect a signal from at least a RFID tag 6 (or transponder) located on a component 4 of the dispenser 1.

[0049] The microcontroller 3 stores a unique identifier associated to the RFID tag 6 and reads the signal of the RFID tag 6 for identifying the component 4 and the position of the component 4 with respect to the antenna 7.

[0050] In a preferred manner, the fuel dispenser 1 comprises an induction device 9 comprising a single conductive cable 10 comprising an input 11 and an output 12 connected to the microcontroller 3, the conductive cable 10 being arranged such as to form the antenna 7.

[0051] The component 4 can be a fuel nozzle 4 or another part of the fuel dispenser 1 as a door 23 closing the hydraulic compartment 18, the motor 8 or electrovalves or fuel flow meters 16. The door 23 can comprise a RFID tag 6. The antenna 7 is fixed to a part of the fuel dispenser 1 as the frame for instance such as to be near to the RFID tag 6 when the door 23 is closed. RFID tag 6 is detected by the antenna 7 and identified by the microcontroller 3.

[0052] The opening of the door 23 is detected by the antenna 7 that receive no more signal from the RFID tag 6. The microcontroller 3 receives no more signal associated to the RFID tag 6 frequency. It is interpreted as an opening of the door 23. The microcontroller 3 send a signal to the control unit 2 that sends a warning signal to a remote server or computer or mobile phone. It is particularly useful for anti-fraud detection.

[0053] Fig. 2 illustrates more in detail the preferred embodiment of Fig. 1 wherein the fuel dispenser 1 comprises a unique induction device 9 comprising a single conductive cable 10 arranged such as to form several antennas 7 on or near the nozzle boots 5 of the first raw 13 and the second raw 14 of nozzle boots 5. The conductive cable 10 comprises only one input 11 and only one output 12 connected to the microcontroller 3.

[0054] According to another embodiment, the microcontroller 3 comprises means for measuring the distance between the antenna 7 and the RFID tag 6. The antenna 7 is an inductive loop that is active because energized. It is sending a radio frequency wave to the RFID tag 6 that is passive. The RFID tag 6 receive the radio frequency wave that is reflected toward the antenna 7. The distance between the RFID tag 6 and the antenna 7 is deduced from the response time of the reflected radio frequency wave.

[0055] The microcontroller 3 compares the response time t_0 associated to the RFID tag 6 at its idle position to the response time t_1 associated to a removed position of the RFID tag 6.

[0056] Distance D_0 and D_1 are calculated knowing the speed of radio frequency wave in the air. If D_0 is different from D_1 , the microcontroller 3 deduces that the RFID tag 6 has been moved. The microcontroller 3 deduces also the position of the RFID tag 6 with respect to the antenna 7.

[0057] Alternatively, the component 4 can be a fuel meter 16 or the door closing the electronic compartment 20.

[0058] Alternatively, the induction device 9 could be used for detecting an RFID tag fixed in a vehicle as disclosed in the document GB2437276A describing a system for preventing the inadvertent dispensing of the incorrect type of fuel into a vehicle fuel tank. It comprises an RFID transponder which is indicative of a first type of fuel.

[0059] The distance between the vehicle and the antenna 7 can be calculated by the microcontroller 3 in order to analyse if the vehicle is near or far from the fuel dispenser 1. Distance of one meter or three meters can be detected to verify if the vehicle identified by the antenna 7 is really the nearest one. For this application, more power is supplied to the antenna 7.

[0060] The conductive cable 10 of the antenna comprises a copper wire.

[0061] According to an embodiment, the copper wire is embedded in a polymeric sheath as a TV antenna cable, for instance. In a preferred embodiment, the part of the copper wire forming the antenna 7 is free of polymeric sheath for improving the signal strength.

[0062] According to another embodiment represented on figure 3, the conductive cable 10 is a dipole cable comprising a first part 24 forming an antenna 7 with a single copper wire and a second part 25 including two copper wires embedded in a sheath.

[0063] The first part 24 comprises the antennas 7

surrounding the respective nozzle boots 5. The second part 25 comprises the input 11 and the output 12 and is connected to the microcontroller 3.

[0064] According to another embodiment represented on figure 4, the conductive cable 10 is a dipole cable comprising a first linear part 26 and a second linear part 27 forming an antenna 7 including a copper wire and a third part 28 including two copper wires embedded in a sheath forming a cable that is connected to the microcontroller 3. The third part 28 includes the input 11 and the output 12.

[0065] In one specific embodiment, the antenna 7 is configured to detect the lifting of the at least one fuel nozzle 4 from the nozzle boot 5 at the beginning of a refuelling operation, and the microcontroller 3 is adapted to read the signal detected by the antenna 7 for identifying the RFID tag 6, and to send a signal to the control unit 2 for starting a pumping unit 8 of the fuel dispenser 1. In a similar manner, the antenna 7 is configured to detect a signal from the RFID tag 6 when the at least one fuel nozzle 4 is hung at the nozzle boot 5 after a refuelling operation, and the microcontroller 3 is adapted to read the signal detected by the antenna 7 for identifying the RFID tag 6, and to send a signal to the control unit 2 for stopping a pumping unit 8 of the fuel dispenser 1.

[0066] It is understood that other variations in the present invention are contemplated and in some instances, some features of the invention can be employed without a corresponding use of other features.

[0067] For instance, the antenna 7 can have a shape of loop, spiral, semi-loop or be linear as represented in figure 4. Further examples are presented in figure 2 and 5.

[0068] In case of several antennas 7 located near the components 4, the antenna 7 can be formed of a small loop or spiral having a diameter between 1 cm to 10 cm.

[0069] The antenna 7 can be located beside the nozzle boot 5.

[0070] The antenna 7 can be located inside the nozzle boot 5 in front of the RFID tag 6 when the fuel nozzle 4 is hung on the nozzle boot 5.

[0071] As example, Fig. 5 illustrates an induction device 9 comprising a single conductive cable 10 comprising an input 11 and an output 12 connected to the microcontroller 3.

[0072] The conductive cable 10 is arranged such as to form a unique antenna 7 located behind each nozzle boot 5 and enables to detect the RFID tags 6 of all the fuel nozzles 4.

[0073] Fig. 6 illustrates a second embodiment wherein the fuel dispenser 1 comprises a first side with a first raw 13 of nozzle boots 5 intended to support fuel nozzles 4 dedicated to deliver several kinds of fuels and a second side with a second raw 14 of nozzle boots 5 intended to support fuel nozzles 4 dedicated to deliver several kinds of fuels.

[0074] The fuel dispenser 1 further comprises a first induction device 9a including a first conductive cable 10a

arranged such as to form several antennas 7 on or near the nozzle boots 5 of the first raw 13 of nozzle boots 5 and comprising a first input 11a and a first output 12a connected to the microcontroller 3.

[0075] The fuel dispenser 1 further comprises a second induction device 9b including a second conductive cable 10b arranged such as to form several antennas 7 on or near the nozzle boots 5 of the second raw 14 of nozzle boots 5 and comprising a second input 11b and a second output 12b connected to the microcontroller 3.

Claims

1. A fuel dispenser (1) for refuelling vehicles comprising a control unit (2) connected to a microcontroller (3),

characterised by comprising at least one antenna (7) connected to the microcontroller (3) and configured to detect a signal from at least a RFID tag (6) located on a component (4) of the dispenser (1),
 wherein the microcontroller (3) is adapted to store a unique identifier associated to the RFID tag (6) and to read the signal of the RFID tag (6) for identifying the component (4) and/or the position of the component (4) with respect to the antenna (7).
2. A fuel dispenser (1) according to claim 1, wherein the antenna (7) is configured to detect the lifting of the at least one fuel nozzle (4) from the nozzle boot (5) at the beginning of a refuelling operation, and the microcontroller (3) is adapted to read the signal detected by the antenna (7) for identifying the RFID tag (6), and to send a signal to the control unit (2) for starting a pumping unit (8) of the fuel dispenser (1).
3. A fuel dispenser (1) according to claim 2, wherein it comprises one antenna (7) per nozzle boot (5) that is configured to detect a signal from only one RFID tag (6) fixed on a fuel nozzle (4), the antenna (7) being located on or near the nozzle boot (5).
4. A fuel dispenser (1) according to anyone of claims 2 or 3, wherein it comprises an induction device (9) comprising a single conductive cable (10) comprising an input (11) and an output (12) connected to the microcontroller (3), the conductive cable (10) being arranged such as to form the antenna (7) on or near each nozzle boot (5).
5. A fuel dispenser (1) according to claim 4, wherein the conductive cable (10) is arranged in loops around each nozzle boot (5).
6. A fuel dispenser (1) according to claim 4, wherein each nozzle boot (5) comprises a recess on its back face in which the antenna (7) is inserted.
7. A fuel dispenser (1) according to claim 4, wherein the antenna (7) is embedded inside each nozzle boot (5).
8. A fuel dispenser (1) according to anyone of claims 2 to 7, further comprising
 a first side with a first raw (13) of nozzle boots (5) intended to support fuel nozzles (4) dedicated to deliver several kinds of fuels,
 a second side with a second raw (14) of nozzle boots (5) intended to support fuel nozzles (4) dedicated to deliver several kinds of fuels,
 a first induction device (9a) including a first conductive cable (10a) arranged such as to form several antennas (7) on or near the nozzle boots (5) of the first raw (13) of nozzle boots (5) and comprising a first input (11a) and a first output (12a) connected to the microcontroller (3) and
 a second induction device (9b) including a second conductive cable (10b) arranged such as to form several antennas (7) on or near the nozzle boots (5) of the second raw (14) of nozzle boots (5) and comprising a second input (11b) and a second output (12b) connected to the microcontroller (3).
9. A fuel dispenser (1) according to anyone of claims 2 to 7, further comprising
 a first side with a first raw (13) of nozzle boots (5) intended to support fuel nozzles (4) dedicated to deliver several kinds of fuels,
 a second side with a second raw (14) of nozzle boots (5) intended to support fuel nozzles (4) dedicated to deliver several kinds of fuels, and
 a unique induction device (9) comprising a single conductive cable (10) arranged such as to form several antennas (7) on or near the nozzle boots (5) of the first raw (13) and the second raw (14) of nozzle boots (5) and comprising an input (11) and an output (12) connected to the microcontroller (3).
10. A fuel dispenser (1) according to anyone of claims 2-9, wherein it comprises a single antenna (7) configured to detect several RFID tags (6).
11. A fuel dispenser (1) according to anyone of claims 2 to 10, wherein the fuel nozzle (4) comprises a handle protected with a plastic skirt, the RFID tag (6) being located in the plastic skirt.
12. A fuel dispenser according to anyone of claims 2 to 11, wherein the microcontroller (3) comprises means for measuring the distance between the antenna (7)

and the RFID tag (6).

13. A method for detecting a component (4) of a fuel dispenser (1), the method comprising:

providing a fuel dispenser for refuelling vehicles comprising a control unit and at least one antenna connected to a microcontroller, detecting a signal from at least a RFID tag (6) located on the component (4), reading the signal of the RFID tag (6), comparing the signal of the RFID tag (6) with a unique identifier associated to the RFID tag (6) to identify the component (4) and/or the position of the component (4).

Patentansprüche

1. Kraftstoffabgabevorrichtung (1) zum Betanken von Fahrzeugen, eine Steuereinheit (2) umfassend, die mit einem Mikrocontroller (3) verbunden ist,

dadurch gekennzeichnet, dass sie mindestens eine Antenne (7) umfasst, die mit dem Mikrocontroller (3) verbunden und dafür ausgelegt ist, ein Signal von mindestens einem RFID-Tag (6) zu erfassen, das sich an einer Komponente (4) der Abgabevorrichtung (1) befindet, wobei der Mikrocontroller (3) dafür ausgelegt ist, eine mit dem RFID-Tag (6) verknüpfte eindeutige Kennung zu speichern und das Signal des RFID-Tags (6) zum Identifizieren der Komponente (4) und/oder der Position der Komponente (4) in Bezug auf die Antenne (7) zu lesen.

2. Kraftstoffabgabevorrichtung (1) nach Anspruch 1, wobei die Antenne (7) dafür ausgelegt ist, das Abheben der mindestens einen Kraftstoffzapfpistole (4) von der Zapfpistolenaufnahme (5) zu Beginn eines Betankungsvorgangs zu erfassen, und der Mikrocontroller (3) dafür ausgelegt ist, das durch die Antenne (7) erkannte Signal zum Identifizieren des RFID-Tags (6) zu lesen und ein Signal an die Steuereinheit (2) zum Starten einer Pumpeinheit (8) der Kraftstoffabgabevorrichtung (1) zu senden.
3. Kraftstoffabgabevorrichtung (1) nach Anspruch 2, wobei diese eine Antenne (7) pro Zapfpistolenaufnahme (5) umfasst, die dafür ausgelegt ist, ein Signal von nur einem RFID-Tag (6) zu erkennen, das an einer Kraftstoffzapfpistole (4) befestigt ist, wobei sich die Antenne (7) an oder in der Nähe der Zapfpistolenaufnahme (5) befindet.
4. Kraftstoffabgabevorrichtung (1) nach einem der Ansprüche 2 oder 3, wobei diese eine Induktionsvorrichtung (9) umfasst, die ein einziges leitendes Kabel

(10) mit einem Eingang (11) und einem Ausgang (12) umfasst, das mit dem Mikrocontroller (3) verbunden ist, wobei das leitende Kabel (10) etwa so angeordnet ist, dass es die Antenne (7) an oder in der Nähe jeder Zapfpistolenaufnahme (5) bildet.

5. Kraftstoffabgabevorrichtung (1) nach Anspruch 4, wobei das leitende Kabel (10) in Schleifen um jede Zapfpistolenaufnahme (5) angeordnet ist.
6. Kraftstoffabgabevorrichtung (1) nach Anspruch 4, wobei jede Zapfpistolenaufnahme (5) an ihrer Rückseite eine Aussparung aufweist, in die die Antenne (7) eingesetzt wird.
7. Kraftstoffabgabevorrichtung (1) nach Anspruch 4, wobei die Antenne (7) in jede Zapfpistolenaufnahme (5) eingebettet ist.

8. Kraftstoffabgabevorrichtung (1) nach einem der Ansprüche 2 bis 7, ferner umfassend

eine erste Seite mit einer ersten Reihe (13) von Zapfpistolenaufnahmen (5), die dazu bestimmt sind, Kraftstoffzapfpistolen (4) zu halten, die dazu bestimmt sind, mehrere Arten von Kraftstoffen abzugeben,

eine zweite Seite mit einer zweiten Reihe (14) von Zapfpistolenaufnahmen (5), die dazu bestimmt sind, Kraftstoffzapfpistolen (4) zu halten, die dazu bestimmt sind, mehrere Arten von Kraftstoffen abzugeben,

eine erste Induktionsvorrichtung (9a), die ein erstes leitendes Kabel (10a) aufweist, das so angeordnet ist, dass es mehrere Antennen (7) an oder in der Nähe der Zapfpistolenaufnahmen (5) der ersten Reihe (13) von Zapfpistolenaufnahmen (5) bildet, und das einen ersten Eingang (11a) und einen ersten Ausgang (12a) umfasst, die mit dem Mikrocontroller (3) verbunden sind, und

eine zweite Induktionsvorrichtung (9b), die ein zweites leitendes Kabel (10b) aufweist, das so angeordnet ist, dass es mehrere Antennen (7) an oder in der Nähe der Zapfpistolenaufnahmen (5) der zweiten Reihe (14) von Zapfpistolenaufnahmen (5) bildet, und das einen zweiten Eingang (11b) und einen zweiten Ausgang (12b) umfasst, die mit dem Mikrocontroller (3) verbunden sind.

9. Kraftstoffabgabevorrichtung (1) nach einem der Ansprüche 2 bis 7, ferner umfassend

eine erste Seite mit einer ersten Reihe (13) von Zapfpistolenaufnahmen (5), die dazu bestimmt sind, Kraftstoffzapfpistolen (4) zu halten, die dazu bestimmt sind, mehrere Arten von Kraft-

- stoffen abzugeben,
eine zweite Seite mit einer zweiten Reihe (14)
von Zapfpistolenaufnahmen (5), die dazu be-
stimmt sind, Kraftstoffzapfpistolen (4) zu halten,
die dazu bestimmt sind, mehrere Arten von 5
Kraftstoffen abzugeben, und eine einzige Induk-
tionsvorrichtung (9b), die ein einzelnes leiten-
des Kabel (10) aufweist, das so angeordnet ist,
dass es mehrere Antennen (7) an oder in der 10
Nähe der Zapfpistolenaufnahmen (5) der ersten
Reihe (13) und der zweiten Reihe (14) von Zapf-
pistolenaufnahmen (5) bildet, und das einen
Eingang (11) und einen Ausgang (12) umfasst,
die mit dem Mikrocontroller (3) verbunden sind.
10. Kraftstoffabgabevorrichtung (1) nach einem der An-
sprüche 2-9, wobei diese eine einzige Antenne (7)
umfasst, die dafür ausgelegt ist, mehrere RFID-Tags
(6) zu erkennen. 15
11. Kraftstoffabgabevorrichtung (1) nach einem der An-
sprüche 2 bis 10, wobei die Kraftstoffzapfpistole (4)
einen mit einer Kunststoffschürze geschützten Griff
umfasst, wobei das RFID-Tag (6) in der Kunststoffs-
schürze angeordnet ist. 20
12. Kraftstoffabgabevorrichtung nach einem der An-
sprüche 2 bis 11, wobei der Mikrocontroller (3) Mittel
zum Messen des Abstands zwischen der Antenne
(7) und dem RFID-Tag (6) umfasst. 25
13. Verfahren zum Erkennen einer Komponente (4) ei-
ner Kraftstoffabgabevorrichtung (1), wobei das Ver-
fahren umfasst: 30
- Bereitstellen einer Kraftstoffabgabevorrichtung
zum Betanken von Fahrzeugen, die eine
Steuereinheit und mindestens eine mit einem
Mikrocontroller verbundene Antenne umfasst,
Erkennen eines Signals von mindestens einem 35
RFID-Tag (6), das sich an der Komponente (4)
befindet,
Lesen des Signals des RFID-Tags (6),
Vergleichen des Signals des RFID-Tags (6) mit
einer eindeutigen Kennung, die mit dem RFID- 40
Tag (6) verknüpft ist, um die Komponente (4)
und/oder die Position der Komponente (4) zu
identifizieren. 45
- Revendications**
1. Distributeur (1) de carburant pour réapprovisionner
des véhicules en carburant, comprenant une unité
de commande (2) reliée à un microcontrôleur (3), 50
- caractérisé en ce qu'il** comprend au moins une
antenne (7) reliée au microcontrôleur (3) et
- configurée pour détecter un signal en prove-
nance d'au moins une antenne RFID (6) située
sur un composant (4) du distributeur (1),
dans lequel le microcontrôleur (3) est adapté à
stocker un identifiant unique associé à l'éti-
quette RFID (6) et à lire le signal de l'étiquette
RFID (6) pour identifier le composant (4) et/ou la
position du composant (4) par rapport à l'an-
tenne (7).
2. Distributeur (1) de carburant selon la revendication
1, dans lequel l'antenne (7) est configurée pour
détecter le soulèvement de l'au moins un pistolet
(4) à carburant depuis le repose-pistolet (5) au début
d'une opération de réapprovisionnement en carbu-
rant, et le microcontrôleur (3) est adapté à lire le
signal détecté par l'antenne (7) pour identifier l'éti-
quette RFID (6), et à envoyer un signal à l'unité de
commande (2) pour démarrer une unité de pompage
(8) du distributeur (1) de carburant. 55
3. Distributeur (1) de carburant selon la revendication
2, comprenant une antenne (7) par repose-pistolet
(5) qui est configurée pour détecter un signal en
provenance d'une seule étiquette RFID (6) fixée
sur un pistolet (4) à carburant, l'antenne (7) étant
située sur ou à proximité du repose-pistolet (5).
4. Distributeur (1) de carburant selon l'une quelconque
des revendications 2 ou 3, comprenant un dispositif
à induction (9) comprenant un unique câble conduc-
teur (10) comprenant une entrée (11) et une sortie
(12) reliées au microcontrôleur (3), le câble conduc-
teur (10) étant agencé de manière à former l'antenne
(7) sur ou à proximité de chaque repose-pistolet (5).
5. Distributeur (1) de carburant selon la revendication
4, dans lequel le câble conducteur (10) est agencé
en boucles autour de chaque repose-pistolet (5).
6. Distributeur (1) de carburant selon la revendication
4, dans lequel chaque repose-pistolet (5) comprend
un renforcement sur sa face arrière dans lequel est
insérée l'antenne (7).
7. Distributeur (1) de carburant selon la revendication
4, dans lequel l'antenne (7) est incorporée à l'inté-
rieur de chaque repose-pistolet (5).
8. Distributeur (1) de carburant selon l'une quelconque
des revendications 2 à 7, comprenant en outre
- un premier côté doté d'une première rangée (13)
de repose-pistolets (5) destinés à supporter des
pistolets (4) à carburant dédiés à la livraison de
plusieurs types de carburants,
un deuxième côté doté d'une deuxième rangée
(14) de repose-pistolets (5) destinés à supporter

- des pistolets (4) à carburant dédiés à la livraison de plusieurs types de carburants, un premier dispositif à induction (9a) comportant un premier câble conducteur (10a) agencé de manière à former plusieurs antennes (7) sur ou à proximité des repose-pistolets (5) de la première rangée (13) de repose-pistolets (5) et comprenant une première entrée (11a) et une première sortie (12a) reliées au microcontrôleur (3) et un deuxième dispositif à induction (9b) comportant un deuxième câble conducteur (10b) agencé de manière à former plusieurs antennes (7) sur ou à proximité des repose-pistolets (5) de la première rangée (14) de repose-pistolets (5) et comprenant une deuxième entrée (11b) et une deuxième sortie (12b) reliées au microcontrôleur (3).
- 5 10 15
9. Distributeur (1) de carburant selon l'une quelconque des revendications 2 à 7, comprenant en outre 20
- un premier côté doté d'une première rangée (13) de repose-pistolets (5) destinés à supporter des pistolets (4) à carburant dédiés à la livraison de plusieurs types de carburants, 25
- un deuxième côté doté d'une deuxième rangée (14) de repose-pistolets (5) destinés à supporter des pistolets (4) à carburant dédiés à la livraison de plusieurs types de carburants, et 30
- un unique dispositif à induction (9) comprenant un unique câble conducteur (10) agencé de manière à former plusieurs antennes (7) sur ou à proximité des repose-pistolets (5) de la première rangée (13) et de la deuxième rangée (14) de repose-pistolets (5) et comprenant une 35
- entrée (11) et une sortie (12) reliées au microcontrôleur (3).
10. Distributeur (1) de carburant selon l'une quelconque des revendications 2 à 9, comprenant une seule antenne (7) configurée pour détecter plusieurs étiquettes RFID (6). 40
11. Distributeur (1) de carburant selon l'une quelconque des revendications 2 à 10, dans lequel le pistolet (4) à carburant comprend une poignée protégée par une jupe en plastique, l'étiquette RFID (6) étant située dans la jupe en plastique. 45
12. Distributeur de carburant selon l'une quelconque des revendications 2 à 11, dans lequel le microcontrôleur (3) comprend des moyens de mesure de la distance entre l'antenne (7) et l'étiquette RFID (6). 50
13. Procédé de détection d'un composant (4) d'un distributeur (1) de carburant, le procédé comprenant : 55
- la fourniture d'un distributeur de carburant pour

réapprovisionner des véhicules en carburant comprenant une unité de commande et au moins une antenne reliée à un microcontrôleur, la détection d'un signal en provenance d'au moins une étiquette RFID (6) située sur le composant (4), la lecture du signal de l'étiquette RFID (6), la comparaison du signal de l'étiquette RFID (6) à un identifiant unique associé à l'étiquette RFID (6) pour identifier le composant (4) et/ou la position du composant (4).

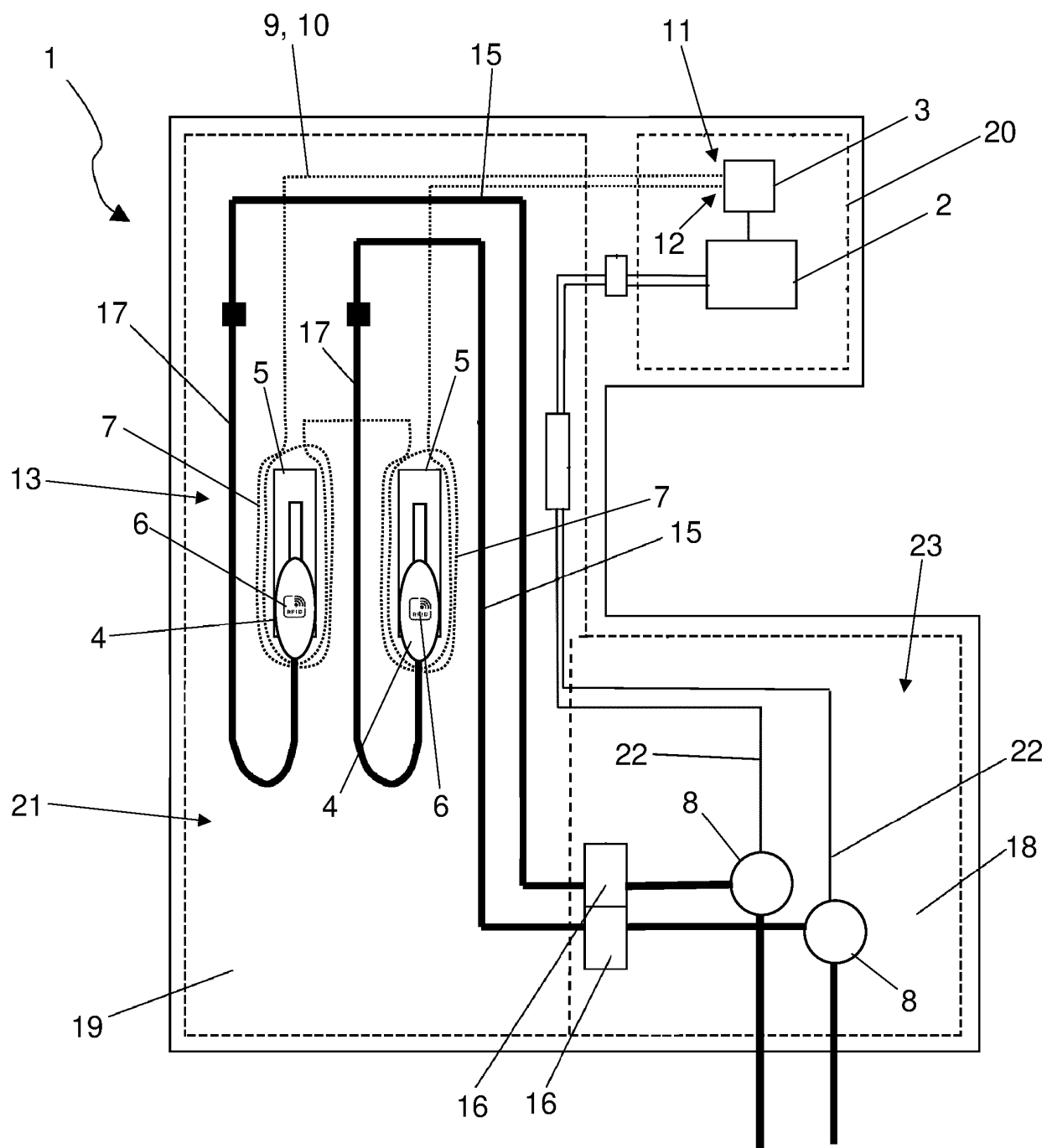


Fig.1

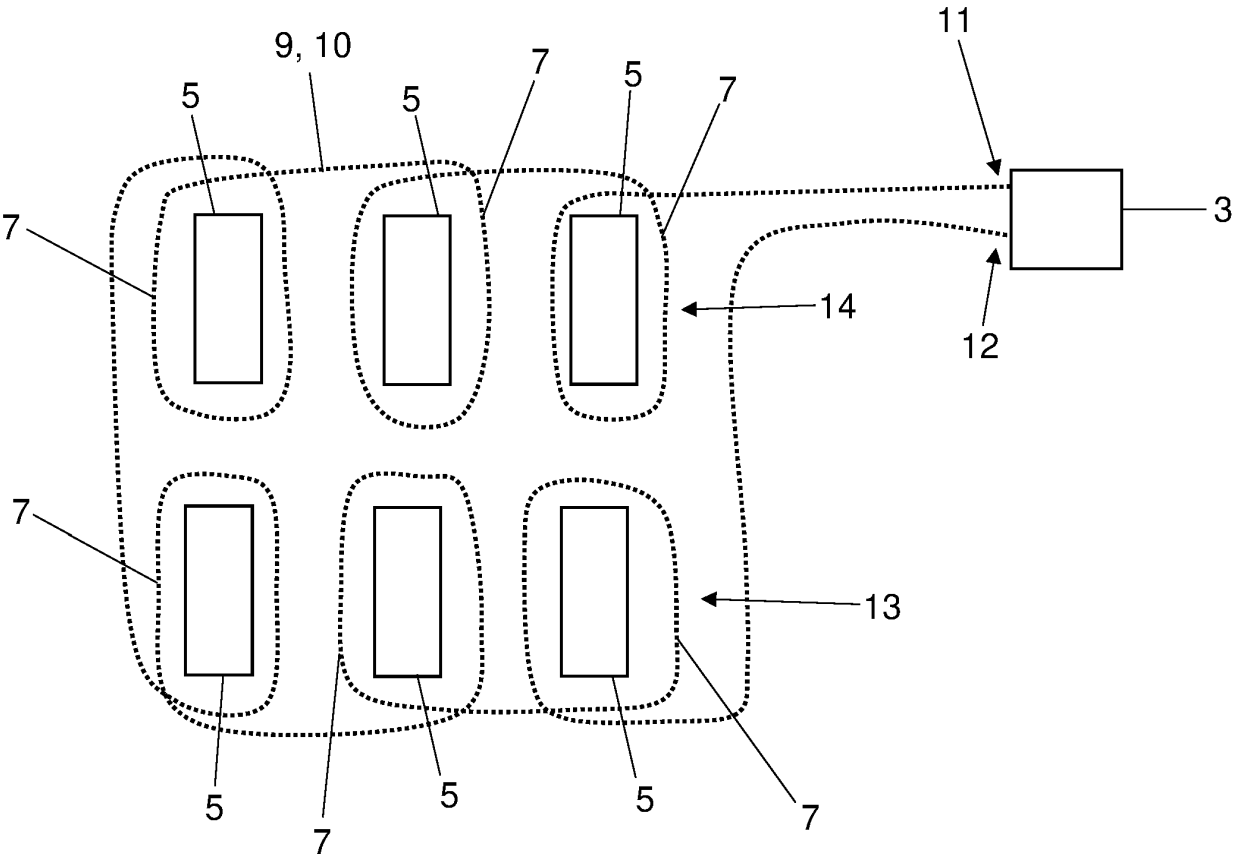


Fig.2

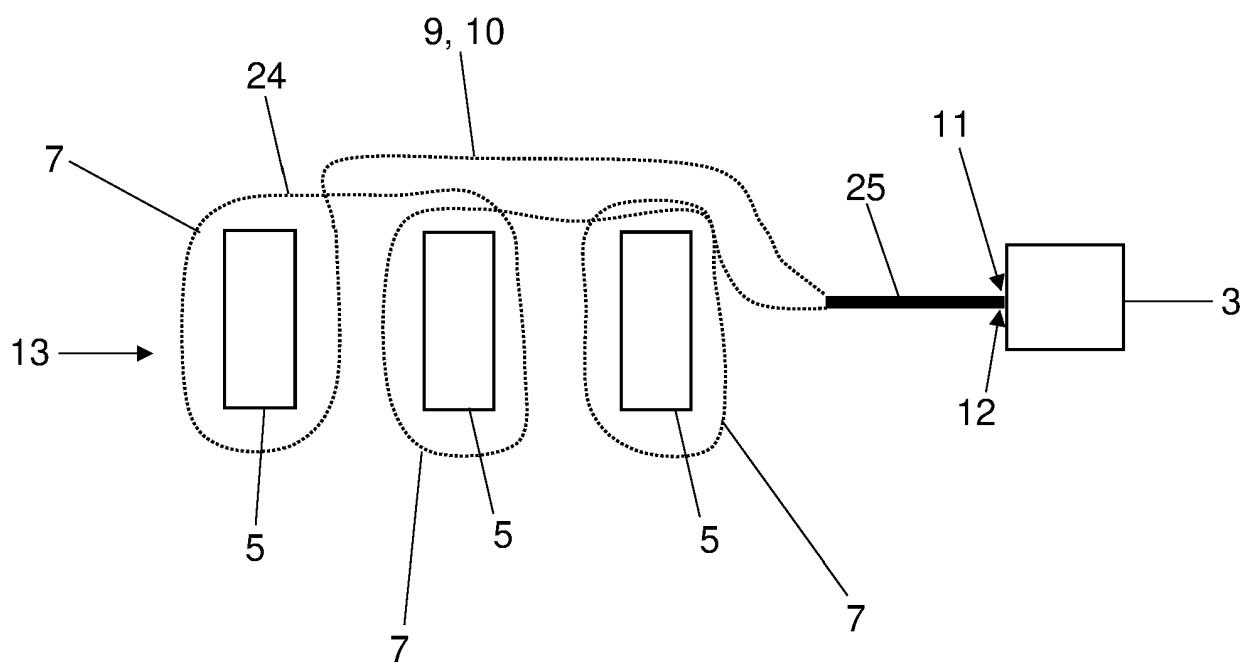


Fig.3

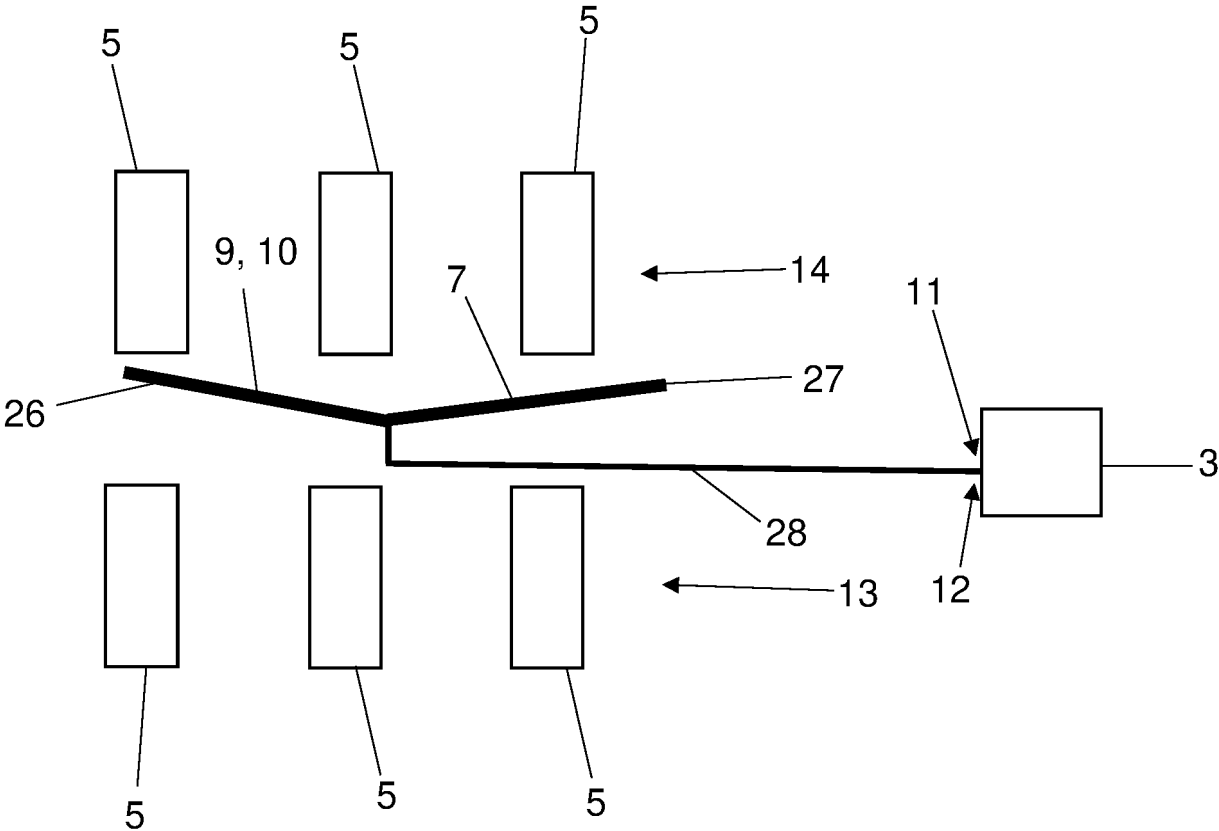


Fig.4

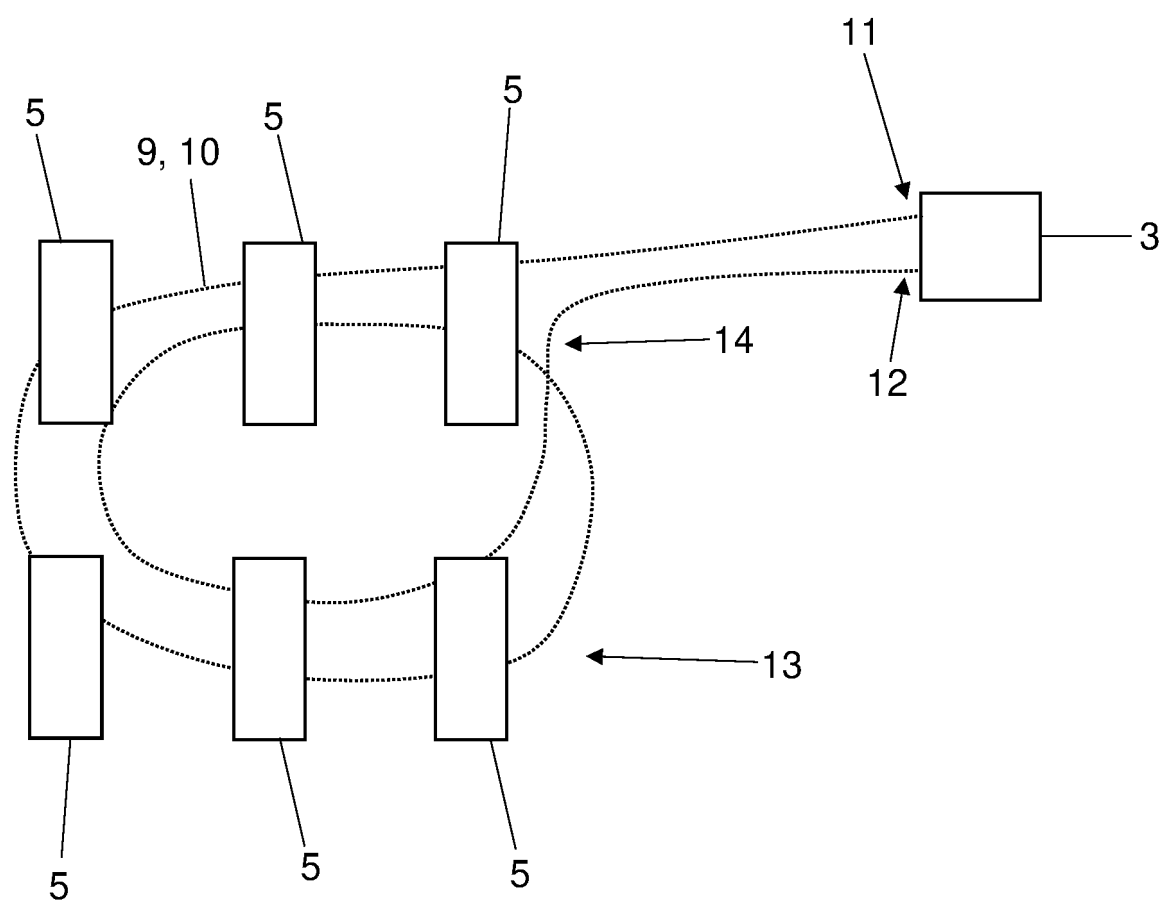


Fig.5

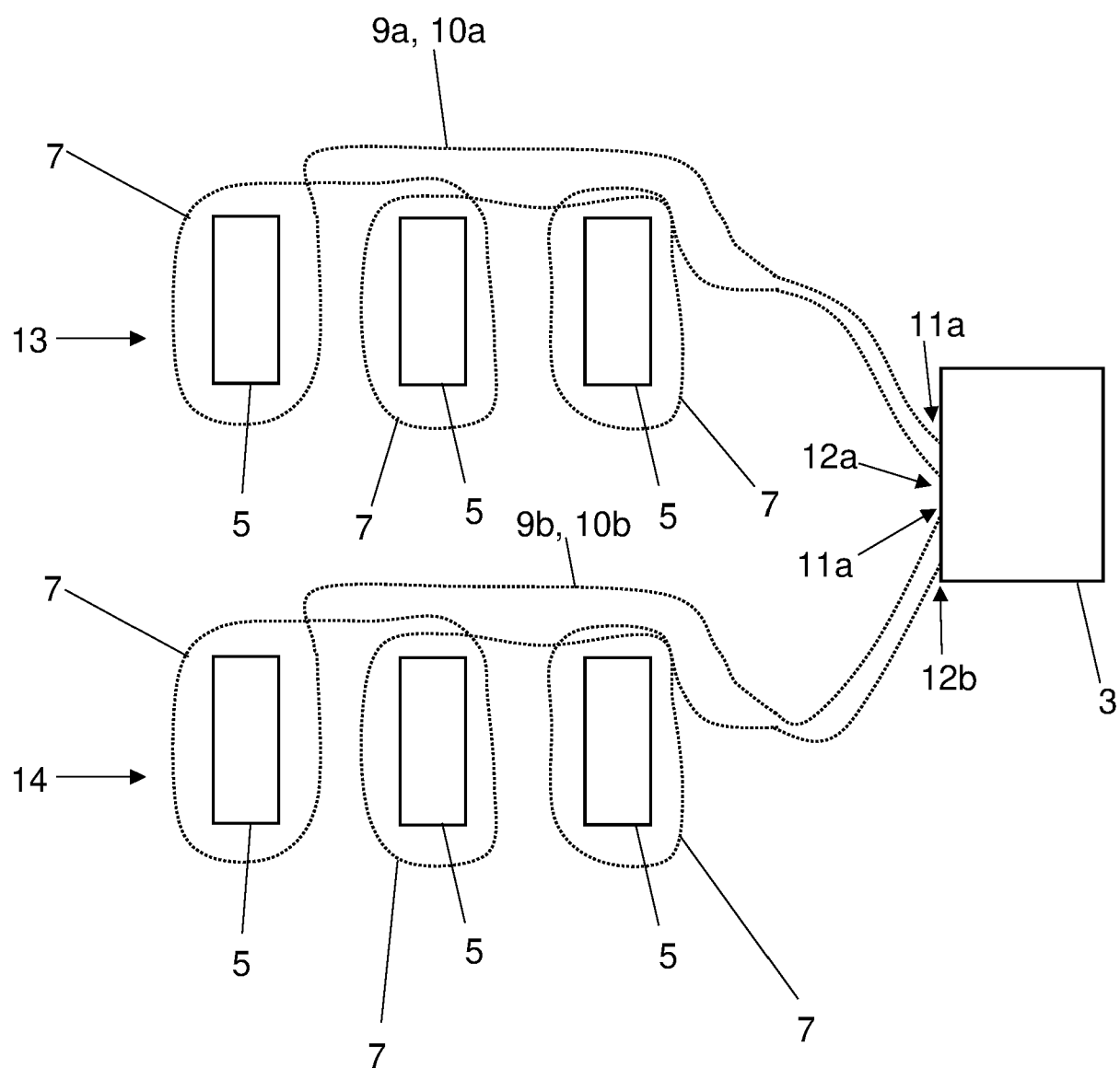


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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