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

(11) **EP 2 774 656 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
03.01.2018 Bulletin 2018/01

(51) Int Cl.:
A62C 37/50 *(2006.01)* ***A62C 13/76*** *(2006.01)*
G05B 23/02 *(2006.01)*

(21) Application number: **13382078.7**

(22) Date of filing: **08.03.2013**

(54) **Control system of fire protection facilities**

Kontrollsystem von Brandschutzeinrichtungen

Système de contrôle d'installations de protection contre l'incendie

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
10.09.2014 Bulletin 2014/37

(73) Proprietors:
- **Vilas Blanco, Carolina**
  50011 Zaragoza (ES)
- **Gil San Jose, Hector**
  50011 Zaragoza (ES)

(72) Inventors:
- **Vilas Blanco, Carolina**
  50011 Zaragoza (ES)
- **Gil San Jose, Hector**
  50011 Zaragoza (ES)

(74) Representative: **Ungria López, Javier**
Avda. Ramón y Cajal, 78
28043 Madrid (ES)

(56) References cited:
WO-A1-2010/035150
CN-U- 201 893 012
US-A- 5 982 274
US-A1- 2006 283 608

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 774 656 B1

Printed by Jouve, 75001 PARIS (FR)

Description

OBJECT OF THE INVENTION

[0001] The following invention, as expressed on the heading of the present specification, is related to a control system of fire protection facilities, being of the type of fire protection facilities installed in all types of buildings and warehouses fitted with, at least, one pressure group and/or, at least, one equipped fire hydrant and/or, at least, one fire extinguisher, with the corresponding function means, such that the essential object of the invention, in addition to monitoring continuously and automatically that the pressure of every component of the installation is the optimal and that the fire extinguishers are at their location, is to monitor that the safety pins of the actuating lever of the fire extinguishers have not been tampered with.

[0002] Likewise, the pressure gauges of the different components of the facility include Bluetooth transmission with the object of being able to obtain "in situ", in the technical periodic maintenance by using tablet, mobile telephones, PDA or similar, the information concerning the status of the pressure gauge.

FIELD OF APPLICATION

[0003] In the present specification a control system of fire protection facilities is described, which is applicable for installation in all types of buildings, and, thus, is applicable in public institutions, shopping centres, health and educational centres and residential buildings, as well as in all types of businesses and warehouses.

BACKGROUND OF THE INVENTION

[0004] As it is known, the security measures in general and, in particular fire safety measures have been improved overtime with the object of minimizing the risk of the same.

[0005] Thus, the different components of a fire protection facility such as the pressure group, the equipped fire hydrants and the fire extinguishers are provided with pressure gauges that allow knowing that the pressure is the optimal and for this, regular inspections are carried out.

[0006] Despite this, at any time a pressure leak may occur rendering the corresponding component useless, not being aware of it until an "in situ" inspection is performed, such that if said component had to be used during that interval of time it will not be possible, and this may have fatal consequences.

[0007] This problem is exacerbated in those rooms of the facility that are enclosed with restricted access and which are only checked when performing the corresponding inspection of the facility by the maintenance services, so they may be unusable and this is not detected until an inspection. Thus, the discharge of automatic fire extinguishers can occur in burners or boilers where no one accesses until the inspection and that therefore said area is unprotected.

[0008] Likewise, it may also be the case that the pressure group does not have the correct pressure whereby in the event of use of the equipped fire hydrants there will not be the sufficient pressure, with the added disadvantage that by not having the correct pressure the pumps work without enough pressure and they can be damaged and the facility is left unprotected.

[0009] Similarly, the fire extinguishers may lose pressure, they can be discharged or can be stolen, leaving the area unprotected, such that, normally, there is no evidence of it until there is an inspection. Exceptionally, it may be the case that, in those components that are exposed such as fire extinguishers, someone is aware of the lack of pressure or even of the lack of a fire extinguisher and can give notice, although these are very sporadic situations.

[0010] On the other hand, there can be faulty maintenance by the maintenance company of the facility, by carelessness or by lack of the corresponding element, and therefore not being in conditions to be used.

[0011] Ultimately the real fact is that although there may be a fire protection facility properly mounted it may occur that the same is not in the proper conditions of use and therefore in the case of having to make use of it, it does not accomplish its function.

[0012] On the other hand, we can consider document EP 12 38 2288, published as EP 2 687 269 A1), of the same owners of the present document, wherein a control system of fire protection facilities is described, based on providing the pressure gauges of all the components of the facility with a LED light and a communication via radio or wiring, so that, on a pressure drop, they are easily visible using the LED light and through the communication via radio or wiring they can transmit it to a control centre consisting of a monitoring station of the signal that sends a warning by e-mail, telephone or SMS to the computer that can be located at the client's location or at the maintenance company.

[0013] Notwithstanding the foregoing, an existing problem is that in the case of theft or loss of a safety pin of the actuating lever of the fire extinguishers there are no means that allow knowing this, so that, in these circumstances, the fire extinguishers can lose pressure and extinguishing agent and, with this, efficiency or rendering them inoperative.

[0014] Document WO 2010/035150 A1 can be considered as the closest prior art to the present invention. In this document a monitoring device of a fire-fighting equipment of the type comprising a container of a fire-fighting substance is described. The monitoring device is adapted to the fire-fighting equipment and comprises a meter of a parameter related to the fire-fighting substance in said container. This parameter can be, for example, the pressure in the container, the level of the fire-fighting substance in the container, or the amount of fire-fighting sub-

stance already dispensed, among others. The monitoring device comprises as well a first alarm element. The meter is connected by electric cables to the first alarm element, which is adapted to send a signal when the measurement read by the meter reaches a predetermined value. This predetermined value is a reference that identifies a loss of efficiency or functionality in the fire-fighting equipment.

DESCRIPTION OF THE INVENTION

[0015] With the object of solving the mentioned problems, the present specification describes a control system of fire protection facilities that, being of the type of facilities that have, at least, one pressure group and/or, at least, one equipped fire hydrant and/or, at least, one fire extinguisher, comprises in addition:

- ✓ at least, one pressure group equipped with a pressure gauge provided with a LED light and means of communication via radio or wiring;
- ✓ at least, one equipped fire hydrant equipped with a pressure gauge provided with a LED light and means of communication via radio or wiring;
- ✓ at least, one fire extinguisher equipped with a pressure gauge provided with a LED light and means of communication via radio or wiring;
- ✓ a control centre with, at least, one monitoring station responsible for receiving the warning signal from the various components of the facility;
- ✓ a warning receiving centre equipped with, at least, one computer receiving information about the components of the facility from the monitoring station of the control centre via SMS, e-mail or telephone and is connected to the mobile or land telephone network, and the receiving centre may be in the facilities of the client or in the maintenance company, and;
- ✓ a storage database of the plane of the facility with the location of the different components of the same,

such that the system is characterized in that:

- ➢ the pressure gauges of all the components of the facility relating to pressure groups, equipped fire hydrants and fire extinguishers, are provided with a power supply battery and include Bluetooth transmission, and;
- ➢ the safety pin of the actuating lever of the fire extinguishers is directly associated with the corresponding pressure gauge of the same.

[0016] Thus, in a first practical implementation, the safety pin, associated with the pressure gauge is inserted, by one of its ends, in a small hole of the pressure gauge itself in contact with the means of communication.

[0017] In a second practical implementation, the safety pin, associated with the pressure gauge, will be connected to the same by means of a metallic or non-metallic element, e.g. a wire or strand, inserted in a small hole of the pressure gauge itself in contact with the means of communication.

[0018] In this way, in addition to the different benefits already listed in document EP 12 38 2288, through the association of the safety pin to the pressure gauge means, it is provided the additional advantage of being able to control if the safety pin has been tampered with, primarily, if the same has been released, thus leaving the actuating lever of the fire extinguisher free, such that it may be accidentally operated and the fire extinguisher could lose effectiveness or could be discharged.

[0019] Likewise, by incorporating all the pressure gauges of the different components of the facility Bluetooth transmission the technical periodic maintenance may be carried out through a tablet, mobile telephone, PDA or the like in order to obtain the information concerning the status of the pressure gauges "in situ".

[0020] Thus, the control system allows continuous monitoring of the fire protection facility for checking the good condition of the same, which allows that all the components are in perfect state of use.

[0021] To complement the description that will be carried out next, and with the object of helping to a better understanding of the features of the invention, the present specification is accompanied by a set of drawings, in the figures of which are represented the most characteristic details of the invention in an illustrative manner and without limitation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Figure 1. It shows a schematic view of a practical implementation of a fire protection facility formed by a pressure group, two equipped fire hydrants and a series of fire extinguishers that are communicated via radio with a control station.

Figure 2. It shows a front view of a pressure gauge relating to a fire extinguisher provided with a LED light, communication via radio, a battery and Bluetooth transmission and which is associated to the safety pin of the same.

Figure 3. It shows a rear view of the pressure gauge of the previous figure and it can be seen how the same is provided with a small hole in which the safety pin or an element linked to the same fits, to be able to control a possible release of the safety pin.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0023] In view of the aforementioned figures and according to the adopted numbering it can be seen how the control system of fire protection facilities is applicable in all types of fire protection facilities having, at least, one pressure group, and/or, at least, one equipped fire hydrant and/or, at least, one fire extinguisher, such that on the basis of a system in which the pressure gauges of the different components of the facility are equipped with a LED light and means of communication via radio or equivalent, it is about providing with a battery and Bluetooth transmission all the pressure gauges, while, in addition, the pressure gauges relating to the fire extinguishers are associated with the safety pin of the actuating lever of the same.

[0024] In addition, the control system of the fire protection facility has a control centre 11 with, at least, one monitoring station 12 of the signal sent by the different components of the facility, and said incidents are communicated, via e-mail, telephone or SMS, to a computer 13 receiving information from the different components of the facility and this is communicated to the mobile or fixed telephone network, having, at least, one storage database 14 of the plane of the facility to be controlled with the location of the different components of the same.

[0025] The warning receiving centre equipped with a computer 18 receiving information about the status of the facility will be associated with a keyboard and a screen 17 and may be located in the place of the facility or in a different place as it may be in the maintenance company.

[0026] Thus, according to figure 1 of the drawings and by way of example, the pressure group 1 is equipped with a pressure gauge 2 provided with a LED light 3, means of communication via radio 4, a battery 5 and Bluetooth transmission 6.

[0027] In this way, If the pressure in the group falls below a certain parameter the warning LED light 5 will be switched on and the means of communication via radio 4 will send a communication to the station 12 of a control centre 11, in real time, notifying the incidence produced to be able to act accordingly.

[0028] Likewise, the equipped fire hydrants 7 are provided with a pressure gauge 2' also provided with a LED light 3', means of communication via radio 4', a battery 5' and Bluetooth transmission 6', such that if the pressure of the same is below certain parameter the warning LED light 3' will be switched on and the means of communication via radio 4' will send a communication to the station 12 of a control centre 11, in real time, notifying the incidence produced to be able to act accordingly.

[0029] In the same way, the different fire extinguishers 8 of the facility are equipped with a pressure gauge 2" provided with a LED light 3", means of communication via radio 4", a battery 5" and Bluetooth transmission 6", such that if the pressure of any of them is not the optimal, the warning LED light 3" will be switched on and the means of communication via radio 4" will send a communication to the station 12 of a control centre 11, in real time, notifying the incidence produced to be able to act accordingly.

[0030] In this way, the fire protection facility is perfectly monitored, so that any incident that occurs in the same is notified in real time to a station 12 of a control centre 11 that will communicate it to a warning receiving centre 18 that may be located in the maintenance company, in the facilities of the owner of the fire protection facility or both, with a 24-hour monitoring.

[0031] Thus, at the moment of the occurrence of a failure in the facility and after it is communicated to the station 12 of the control centre 11 through the customized software, the component that sends the communication caused by the incidence produced is detected on the plane of the facility, properly stored in the database 14, in which all the components of the same are determined, so that its location is known.

[0032] Simultaneously with this, the red LED light is turned on, visual signal of the failure of the corresponding component.

[0033] In addition, with the object of having complete control of the facility, and in particular of the fire extinguishers or the like, the safety pin of the actuating lever 9 that anchors it with respect to the fixed handle 10, is associated with the pressure gauge 2" to control a possible release of the same.

[0034] Thus, in a first practical implementation, the safety pin 15 of the fire extinguisher can fit in a small hole 19 of the pressure gauge 2" being associated with the means of communication 4", such that when the safety pin 15 is released it detects this and sends a communication to the station 12 of the control centre 11 of the incidence produced and having perfect knowledge of the fire extinguisher 8 in which the incidence has occurred.

[0035] That is, when the safety pin 15 is not in contact with the means of communication, a signal via radio will be emitted to the station 12 of the control centre 11 to give notice of the incidence produced.

[0036] In a second practical implementation of the invention the safety pin 15 can be linked to a metallic or non-metallic element, such as a strand or wire that will fit in the small hole 19 of the pressure gauge 2" associated with the means of communication 4" to detect manipulation of the same.

[0037] This is intended to prevent the release of the safety pin 15 from the actuating lever 9 and the accidental discharge of the fire extinguisher 8 losing efficiency or being rendered unusable.

[0038] On the other hand, by providing the pressure gauges of all the components of the facility (pressure group, equipped fire hydrant and fire extinguishers) with Bluetooth transmission 6, 6', 6", the information concerning the status of the pressure gauge may be obtained "in situ", by means of a tablet, mobile telephone, PDA, or the like in the technical periodic maintenance without relying on the central control system that can be installed in the client's location or in the company responsible for

its maintenance.

[0039] In addition, the Bluetooth system can be activated from the control centre so that the battery is not consumed except when performing the maintenance.

[0040] Depending on the size that the fire protection facility may have, the same may include one or more radio repeaters 16 for the appropriate communication of the information.

[0041] The improvements made in the control system of fire protection facilities provide the following advantages, in addition to those already mentioned in document EP 1238228:

✓ obtainment of the status of the pressure gauges of all the components of the facility, by means of a tablet, mobile telephone, PDA or the like;

✓ control of the possible theft or loss of the safety pin of the actuating lever of the fire extinguishers, and;

✓ activation of the Bluetooth system from the control centre when it is going to be used, preventing the consumption of the battery included in the pressure gauges.

[0042] In short, the object is to be able to remedy any failure of the components of the fire protection facility immediately when they occur, so that all the components are always available.

Claims

1. Control system of fire protection facilities suitable to be installed in all types of buildings and warehouses comprising:

- a first group of elements to be selected between:
  - at least one pressure group (1) equipped with a pressure gauge (2),
  - at least one equipped fire hydrant (7) equipped with a pressure gauge (2'), and
  - at least, one fire extinguisher (8) equipped with a pressure gauge (2"),
- a second group of elements to be selected between:
  - a control centre (11) with, at least, one monitoring station (12) responsible for receiving the warning signal from the various components of the facility, and
  - a warning receiving centre (18) equipped with, at least, one computer (13) receiving information about the components of the facility from the monitoring station (12) of the control centre (11) via SMS, e-mail or telephone and is connected to the mobile or land telephone network, and the warning receiving centre (18) may be in the facilities of the client or in the maintenance company, and
- a third element formed by:
  - a storage database (14) of the plane of the facility to be controlled with the location of the different components of the same,

the pressure gauges (2, 2', 2") being provided with a LED light (3, 3', 3") and means of communication via radio (4, 4', 4") or wiring, and the control system being **characterized in that**:

- the pressure gauge (2, 2', 2") of all the components of the facility relating to pressure group (1), equipped fire hydrant (7) and fire extinguisher (8), are provided with a power supply battery (5, 5', 5") and include Bluetooth transmission (6, 6', 6"),
- a safety pin (15) of the fire extinguishers or similar (8) is associated with the corresponding pressure gauge (2") of the same, and
- an element to be selected between a mobile phone and a mobile computer system using the Bluetooth communication with the pressure gauge (2, 2', 2") for maintenance or installation without relying on the central control system is included.

2. Control system of fire protection facilities, according to claim 1, **characterized in that** the safety pin (15), associated with the pressure gauge (2") is inserted, by one of its ends, in a small hole (19) of the pressure gauge itself in contact with the means of communication (4").

3. Control system of fire protection facilities, according to claim 1, **characterized in that** the safety pin (15), associated with the pressure gauge (2"), is connected to the same by means of an element, inserted in a small hole (19) of the pressure gauge itself (2") in contact with the means of communication (4").

Patentansprüche

1. Kontrollsystem von Brandschutzeinrichtungen geeignet, in allen Typen von Gebäuden und Lagerhäusern installiert zu werden, das umfasst:

- eine erste Gruppe von Elementen, die auszuwählen sind zwischen:

◦ mindestens einer Druckgruppe (1), die mit einem Druckmesser (2) ausgerüstet ist,
◦ mindestens einem ausgestatteten Hydranten (7), der mit einem Druckmesser (2') ausgerüstet ist, und
◦ mindestens einem Feuerlöscher (8), der mit einem Druckmesser (2") ausgerüstet ist,

- eine zweite Gruppe von Elementen, die auszuwählen sind zwischen:

◦ einem Kontrollzentrum (11) mit zumindest einer Überwachungsstation (12), die verantwortlich ist zum Empfangen des Warnsignals von den verschiedenen Komponenten der Einrichtung, und
◦ ein Warnempfangszentrum (18), das mit zumindest einem Computer (13) ausgestattet ist, der Informationen über die Komponenten der Einrichtung von der Überwachungsstation (12) des Kontrollzentrums (11) über SMS, E-Mail oder Telefon empfängt und mit dem Mobil- oder Landtelefonnetz verbunden ist, und das Warnempfangszentrum (18) sich in den Einrichtungen des Benutzers oder in der Wartungsfirma befinden kann, und

- ein drittes Element, das gebildet wird durch:

◦ eine Speicherdatenbank (14) der Ebene der zu kontrollierenden Einrichtung mit dem Ort der unterschiedlichen Komponenten derselben,

wobei die Druckmesser (2, 2', 2") mit einem LED-Licht (3, 3', 3") und Kommunikationsmittel über Funk (4, 4', 4") oder Drahtverbindung versehen sind und das Kontrollsystem **dadurch gekennzeichnet ist, dass**:

- der Druckmesser (2, 2', 2") von allen Komponenten der Einrichtung, die die Druckgruppe (1), den ausgestatteten Hydranten (7) und Feuerlöscher (8) betreffen, mit einer Stromversorgungsbatterie (5, 5', 5") versehen sind und eine Bluetooth-Übertragung (6, 6', 6") enthalten,
- dem entsprechenden Druckmesser (2") derselben ein Sicherheitsstift (15) der Feuerlöscher oder ähnliches (8) zugeordnet ist, und
- ein Element enthalten ist, das auszuwählen ist zwischen einem Mobiltelefon und einem mobilen Computersystem unter Verwendung der Bluetooth-Kommunikation mit dem Druckmesser (2, 2', 2") zur Wartung oder zum Einbau, ohne sich auf das zentrale Kontrollsystem zu stützen.

2. Kontrollsystem von Brandschutzeinrichtungen nach Anspruch 1, **dadurch gekennzeichnet, dass** der dem Druckmesser (2") zugeordnete Sicherheitsstift (15) durch eins seiner Enden in ein kleines Loch (19) des mit dem Kommunikationsmittel (4") selbst in Kontakt befindlichen Druckmessers eingesetzt wird.

3. Kontrollsystem von Brandschutzeinrichtungen nach Anspruch 1, **dadurch gekennzeichnet, dass** der dem Druckmesser (2") zugeordnete Sicherheitsstift mit demselben durch ein Element verbunden ist, das in ein kleines Loch (19) des mit dem Kommunikationsmittel (4") selbst in Kontakt befindlichen Druckmessers (2") eingesetzt wird.

Revendications

1. Système de contrôle des installations de protection contre les incendies approprié pour être installé dans tous les types de bâtiments et d'entrepôts, comprenant :

un premier groupe d'éléments à sélectionner entre :

au moins un groupe de pression (1) équipé avec un manomètre (2),
au moins une borne d'incendie équipée (7), équipée avec un manomètre (2'), et
au moins un extincteur (8) équipé avec un manomètre (2"),

un second groupe d'éléments à sélectionner entre :

un centre de contrôle (11) avec au moins une station de surveillance (12) chargée de recevoir le signal d'alarme des différents composants de l'installation, et
un centre de réception d'alarme (18) équipé avec, au moins un ordinateur (13) recevant l'information concernant les composants de l'installation de la station de surveillance (12) du centre de contrôle (11) via un SMS, un courriel ou par téléphone, et est raccordé au réseau mobile ou téléphone terrestre, et le centre de réception d'alarme (18) peut être dans les installations du client ou chez une entreprise de maintenance, et
un troisième élément formé par :

une base de données de stockage (14) du plan de l'installation à contrôler avec l'emplacement des différents composants de cette dernière,
les manomètres (2, 2', 2") étant dotés d'une lumière à diode électrolumines-

cente (3, 3', 3") et de moyens de communication par radio (4, 4', 4") ou câble, et le système de contrôle étant **caractérisé en ce que** :

les manomètres (2, 2', 2") de tous les composants de l'installation relatifs au groupe de pression (1), à la borne d'incendie équipée (7) et à l'extincteur (8), sont prévus avec une batterie d'alimentation (5, 5', 5") et comprennent la transmission Bluetooth (6, 6' , 6"),
une goupille de sécurité (15) des extincteurs ou similaires (8) est associée au manomètre (2") correspondant de ces derniers, et
un élément à sélectionner entre un téléphone mobile et un système informatique mobile utilisant la communication Bluetooth avec le manomètre (2, 2', 2") pour la maintenance ou l'installation sans dépendre du système de contrôle central est inclus.

2. Système de contrôle des installations de protection contre les incendies selon la revendication 1, **caractérisé en ce que** la goupille de sécurité (15), associée au manomètre (2"), est insérée, par l"une de ses extrémités, dans un petit trou (19) du manomètre lui-même en contact avec les moyens de communication (4").

3. Système de contrôle des installations de protection contre les incendies selon la revendication 1, **caractérisé en ce que** la goupille de sécurité (15), associée au manomètre (2"), est raccordée à ce dernier au moyen d'un élément, inséré dans un petit trou (19) du manomètre (2") lui-même en contact avec les moyens de communication (4").

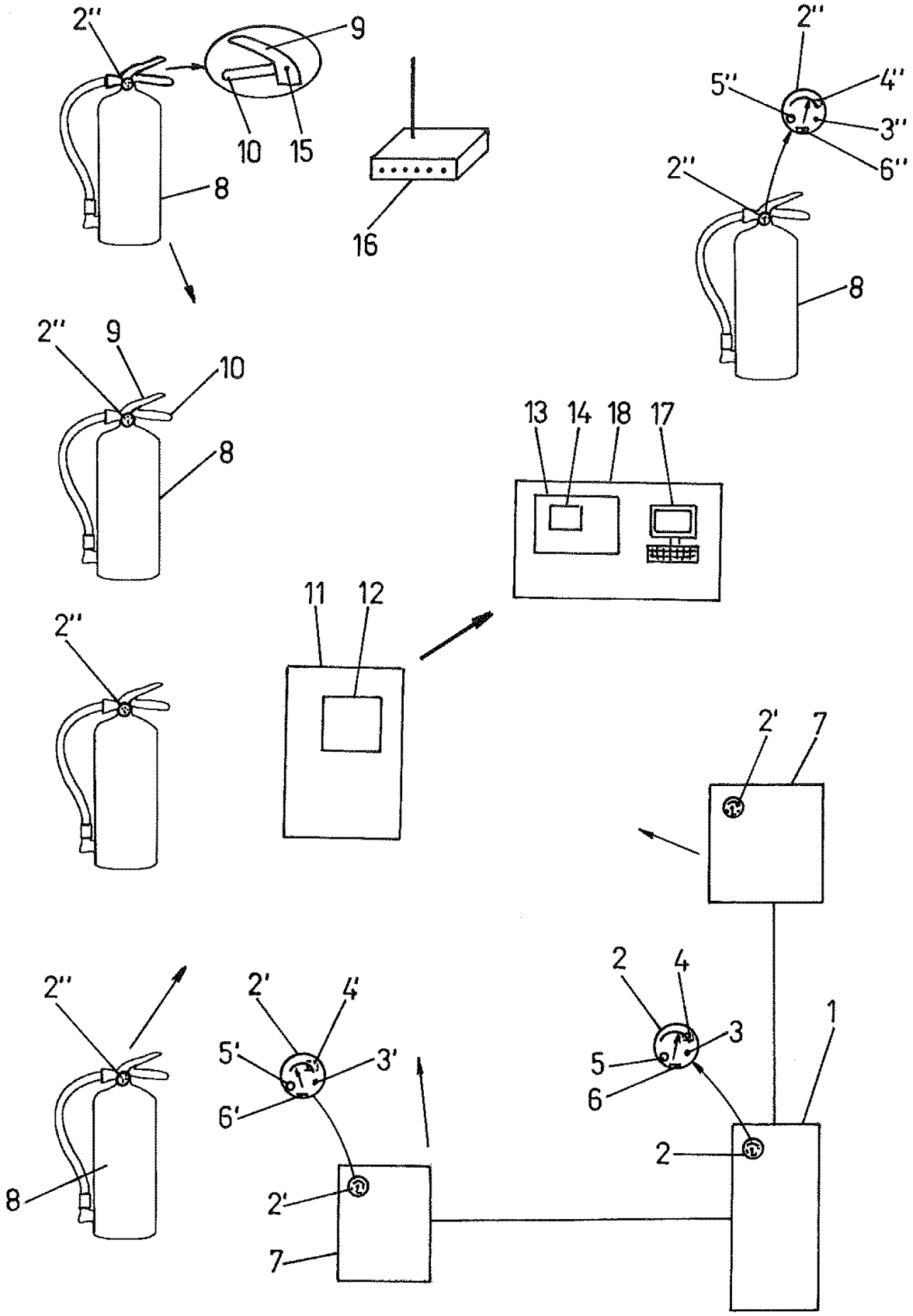

2''
9
10
15
8
16
2''
5''
4''
3''
6''
2''
8
2''
9
10
8
13
14
18
17
11
12
2''
2'
7
2''
2'
4'
5'
3'
6'
2'
7
2
4
3
5
6
2
1
8

FIG. 1

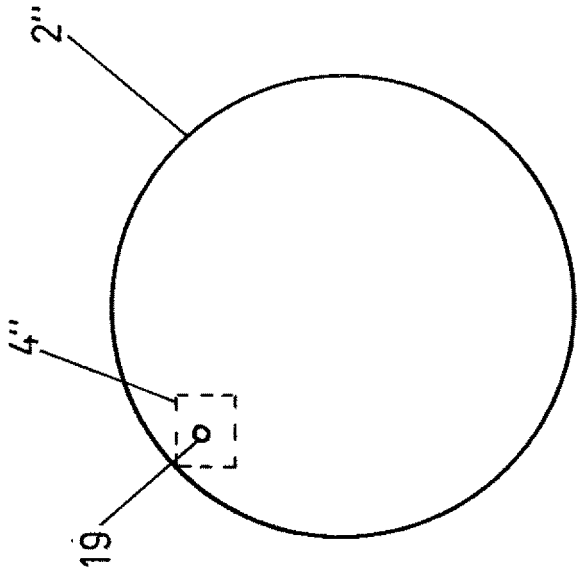


FIG. 3

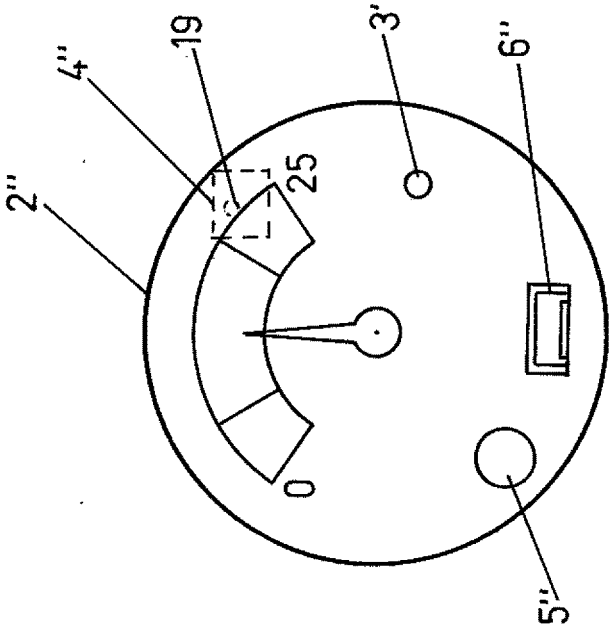


FIG. 2

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 12382288 A **[0012] [0018]**
- EP 2687269 A1 **[0012]**
- WO 2010035150 A1 **[0014]**
- EP 1238228 A **[0041]**