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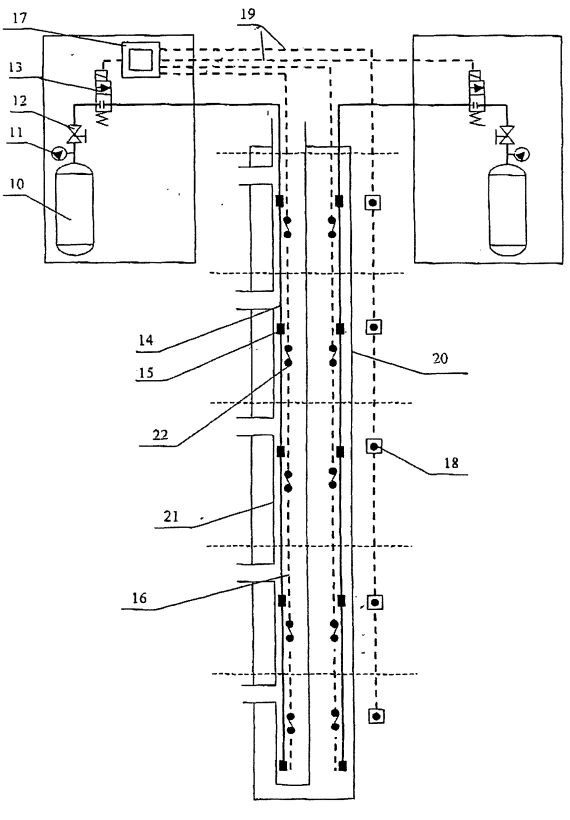
(54) Fixed fire-fighting equipment for the fire protection of the service shafts and vent stacks of buildings, especially existing multi-storey buildings

(57) The object of the utility model is fixed fire-fighting equipment for the fire protection of the service shafts and vent stacks of buildings - especially already existing multi-storey buildings -, comprising an extinguishing system and an electrical extinguishing activating and temperature sensing system, connected to each other through an electrical conductor (19).



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Description

[0001] The object of the invention is fixed fire-fighting equipment for the fire protection of the service shafts and vent stacks of buildings - especially existing multi-storey buildings.

[0002] Multi-storey buildings - especially residential buildings built a long time ago - are characterized by a lot of fire protection problems not present in single-storey, or two-to-three-storey buildings. The higher a building, the greater the risk presented by the vertical architectural, service elements - thus the elevator shaft, the staircase, the service shaft and the vent stack located therein, etc. - from the point of view of fire protection. In the event of fire the service elements, especially the service shaft with the vent stack, significantly increase the risk of fast fire-spread. The so called "stack effect" generated in the vertical architectural elements increases the speed of fire-spread, and may cause further fire occurrences at locations away from the seat of the fire. The most frequent and at the same time most dangerous locations of fire occurrences, and in multi-storey residential buildings fire-spread are: the points where the vent ducts are connected to the homes, the cooker hoods. For the vast majority of home fires occur in kitchens, and spread because a considerable amount of inflammable fat, oil and other residuum is deposited in the cooker hoods. Fires in buildings (panel blocks of flats) that could be extinguished much sooner, and would cause less damage and pose less danger to human life, if the fire protection of the service shafts of multi-storey buildings was solved, occurred in the past and occur even nowadays.

[0003] The state of the art includes many patent descriptions providing a solution for either fire alarm or fire extinguishing.

[0004] The object of patent No. 200238 is a fire alarm cable, comprising two alarm wires twisted together, held together by the twisting and an outer sheath, separated from each other by insulation. The alarm wires disintegrate at a predetermined temperature. This invention is suitable for providing an alarm in a reliable manner in the event of the occurrence (outbreak) of fire.

[0005] Patent No. 224146 discloses a useful invention. The object of the invention is a fire alarm device, comprising sensors for the detection of fire and an evaluation unit triggering the alarm. The evaluation unit, in the event of exceeding the predetermined value of a particular fire characteristic, triggers an alarm signal, indicating the unusability of the affected escape route.

[0006] The object of patent No. 214557 is fire-fighting equipment, where aerosol is generated by the combustion of a solid extinguishing agent in a container outside the protected area, and the generated aerosol is led to the protected area by means of pipes.

[0007] Patent No. E000678 discloses fire-fighting equipment for extinguishing fires occurring in tunnels or similar structures. The fire-fighting equipment has two extinguishing units that can be guided along a guide rail mounted above the passageway, and can be coupled to the rail and moved along the rail by means of a drive system. The extinguishing units have two containers, one container contains the propellant, while the other container contains the extinguishing agent. The container containing the extinguishing agent is connected to the nozzle of the extinguishing unit by means of piping, and the position of the nozzles is adjustable. The extinguishing units have one or more sensors for the detection fire, and for positioning the extinguishing units and controlling the nozzles.

[0008] From the above patents only No. E000678 discloses a similar complex solution for giving an alarm and also extinguishing the fire, but that invention cannot be used in the service shafts and vent stacks of residential buildings.

[0009] The task of the utility model is to provide fixed fire-fighting equipment that allows - especially in the service shafts, and the vent stacks located therein, of medium-height multi-storey residential buildings - the early detection, localization and immediate efficient extinguishing of fires. It shall also inhibit, or significantly delay the spread of fire through the vent system.

[0010] To solve the task, we developed compact fire-fighting equipment relocatable without any modification, which in the event of fire activates the release of the extinguishing agent into the protected space (service shaft and/or vent stack) through the installed extinguishing agent pipe and the openings located thereon automatically, or by means of a manual electrical signalling device.

[0011] The object of the utility model is thus fixed fire-fighting equipment for the fire protection of buildings - especially already existing multi-storey buildings -, comprising an extinguishing system and an electrical extinguishing activating and temperature sensing system, which are connected to each other through an electrical conductor.

The components of the extinguishing system are: an extinguishing agent container-assembly and an extinguishing agent pipe; the extinguishing agent container-assembly is equipped with an activating valve, the extinguishing agent pipe is connected to the activating valve in a releasable manner. The section of the extinguishing agent pipe located in the protected space has at least one opening.

The components of the electrical extinguishing activating and temperature sensing system are: an extinguishing activating unit and a temperature limit sensing electrical conductor. The temperature limit sensing electrical conductor is connected to the extinguishing activating unit in a releasable manner, and the section of the temperature limit sensing electrical conductor located in the protected space is equipped with at least one temperature limit sensing unit. The extinguishing activating unit is connected to the activating valve through an electrical conductor, and the extinguishing agent pipe and the temperature limit sensing electrical conductor are arranged alongside each other in the protected space.

According to a preferred embodiment a manual electrical signalling device is also connected to the extinguishing activating unit.

[0012] The fixed fire-fighting equipment according to the invention is shown in detail in the following figure.

[0013] Figure 1 shows schematically the structure of a possible embodiment of the fixed fire-fighting equipment according to the invention.

[0014] Figure 1 shows a schematic drawing of the fire-fighting equipment installed in the service shaft 20, equipped with a vent stack 21, of a five-storey building. The figure shows well the two main parts of the fixed fire-fighting equipment: the extinguishing system and the electrical extinguishing activating and temperature sensing system.

The extinguishing system comprises an extinguishing agent container-assembly 10 and an extinguishing agent pipe 14. The extinguishing agent container-assembly 10 is generally placed on the roof of the building beside the vent stack 21, above the protected space. The extinguishing agent container-assembly 10 is equipped with a pressure indicating manometer 11, a shut-off valve 12 and an activating valve 13. The extinguishing agent pipe 14 is connected to the activating valve 13, its section located in the protected space (the service shaft 20 and/or the vent stack 21) is equipped with openings 15. The section of the extinguishing agent pipe 14 equipped with openings 15 is installed along the whole length of the protected space.

[0015] The electrical extinguishing activating and temperature sensing system comprises an extinguishing activating unit 17 and a temperature limit sensing electrical conductor 16. The extinguishing activating unit 17 is a unit capable of both receiving electronic signals (activating signals) and transmitting electronic signals. The temperature limit sensing electrical conductor 16, and an electrical conductor 19 are connected to the extinguishing activating unit 17 in a releasable manner.

The temperature limit sensing electrical conductor 16 is equipped with temperature limit sensing units 22. The temperature limit sensing electrical conductor 16 (line-type temperature limit sensing circuit) is a two-wire electrical conductor, which has built-in temperature limit sensing units 22. The section of the temperature limit sensing electrical conductor 16 equipped with temperature limit sensing units 22 is installed along the whole length of the protected space.

In the embodiment the temperature limit sensing units 22 are built-in by storey in the temperature limit sensing electrical conductor 16.

The section of the extinguishing agent pipe 14 equipped with openings 15 and the section of the temperature limit sensing electrical conductor 16 equipped with temperature limit sensing units 22 are bundled together in the protected space.

The direct connection between the extinguishing system and the electrical extinguishing activating and temperature sensing system is ensured by the electrical conductor 19 connecting the extinguishing activating unit 17 to the activating valve 13.

[0016] As shown in the figure, more than one extinguishing systems can be connected to one extinguishing activating unit 17.

[0017] The figure also shows that manual electrical signalling devices 18 are installed by storey in the building, which are also connected to the extinguishing activating unit 17 through the electrical conductor 19 in a releasable manner.

[0018] The extinguishing agent container-assembly 10 is a container dimensioned for the protected space, containing fire-extinguishing powder, foam or extinguishing gas, e.g. a 7-13 litre carbon steel container containing 6-12 kg ABC fire-extinguishing powder (EN 615) at an N_2 pressure of 14 bar.

The shut-off valve 12 is preferably a ball valve or a screw valve.

The extinguishing agent pipe 14 is generally a flexible, heat-resistant rubber pipe according to the local circumstances. The extinguishing agent pipe 14 - if the local circumstances allow - can be a metal pipe (copper or steel pipe). The openings 15 are dimensioned, designed (e.g. nozzles) according to the geometry of the service shaft 20 or the vent stack 21.

The activating temperature of the temperature limit sensing unit 22 is selected, for example, on the basis of the temperature of the flue gases generated in the protected space. It is advisable to set the activating temperature of the temperature limit sensing unit 22 to a range below the ignition temperature: about 150-180°C.

[0019] The fixed fire-fighting equipment according to the utility model can be implemented in various versions, depending on the local circumstances, and the level of risk. The extinguishing agent pipe 14 and the temperature limit sensing electrical conductor 16 can be installed

- in the service shaft and the vent stack,
- only in the vent stack.

[0020] According to another preferred embodiment (e.g. in the case of powder extinguishing agent) the extinguishing agent container-assembly can consist of two containers, where one container contains the propellant (N_2), while the other contains the extinguishing agent (powder).

[0021] According to yet another preferred embodiment sound and light alarm elements are also built-in in the fixed fire-fighting equipment.

[0022] Upon the occurrence of fire, in the event of the automatic activation of extinguishing, the fixed fire-fighting equipment operates in such a way that the temperature limit sensing unit 22 built-in in the temperature limit sensing electrical conductor 16 breaks the circuit (with a potential-free opening contact), thereby sending an activating signal to the extinguishing activating unit 17.

The extinguishing activating unit 17 opens the activating valve 13, and thus the extinguishing agent stored in the

extinguishing agent container-assembly 10 flows to the protected space (service shaft 20 and/or vent stack 21) through the extinguishing agent pipe 14 and the openings 15 located thereon, and extinguishes the fire.

[0023] If extinguishing is activated by means of the manual electrical signalling device 18, the activating signal reaches the extinguishing activating unit 17, which in turn opens the activating valve 13, through the electrical conductor 19.

[0024] The solution according to the utility model is fixed fire-fighting equipment allowing the early detection, localization and efficient extinguishing of fires in the service shafts and/or vent stacks of buildings. It inhibits, or delays the spread of fire through the vent system. The equipment can be installed easily and at low cost in already existing multi-storey residential buildings as well, without any demolition.

A further advantage of the solution according to the utility model is that it is compact, it can be delivered in a prefabricated manner, and it can be relocated from one place to another without any demolition. Considering the fires that have occurred recently in panel blocks of flats, the installation of the equipment forming the object of the utility model, especially in existing medium-height residential buildings by taking into consideration the local circumstances as well, means a partial, but also safety providing solution for one of the most important fire protection problems.

List of references

[0025]

10 Extinguishing agent container-assembly
11 Manometer
12 Shut-off valve
13 Activating valve
14 Extinguishing agent pipe
15 Openings
16 Temperature limit sensing electrical conductor
17 Extinguishing activating unit
18 Manual electrical signalling device
19 Electrical conductor
20 Service shaft
21 Vent stack
22 Temperature limit sensing unit

Claims

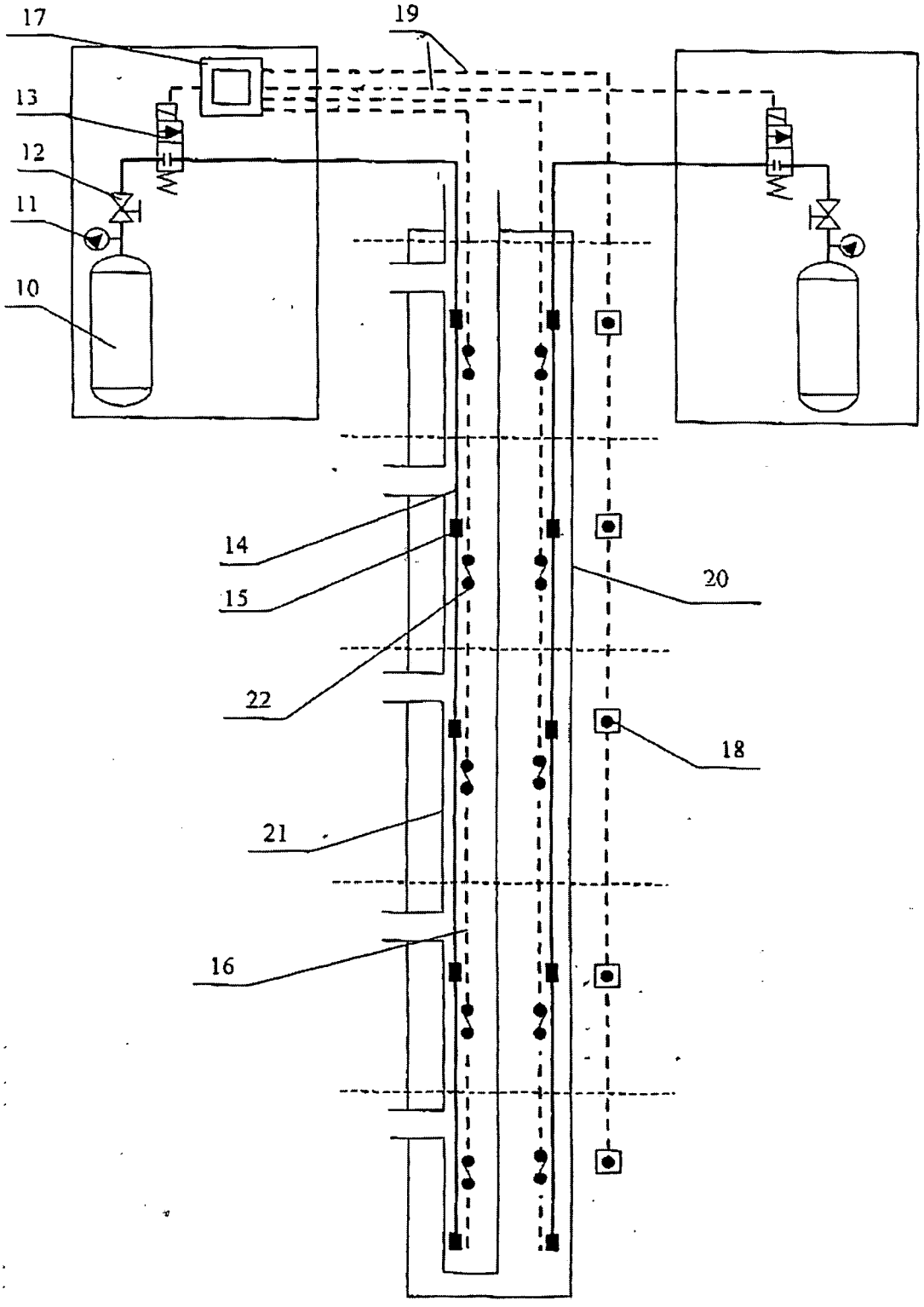
1. Fixed fire-fighting equipment for the fire protection of the service shafts and vent stacks of buildings - especially existing multi-storey buildings -, comprising an extinguishing system and an electrical extinguishing activating and temperature sensing system, which are connected to each other through an electrical conductor (19), wherein the components of the extinguishing system are: an extinguishing agent container-assembly (10) and an extinguishing agent pipe (14); the extinguishing agent container-assembly (10) is equipped with an activating valve (13), the extinguishing agent pipe (14) is connected to the activating valve (13) in a releasable manner, and the section of the extinguishing agent pipe (14) located in the protected space has at least one opening (15);
the components of the electrical extinguishing activating and temperature sensing system are: an extinguishing activating unit (17) and a temperature limit sensing electrical conductor (16); the temperature limit sensing electrical conductor (16) is connected to the extinguishing activating unit (17) in a releasable manner, and the section of the temperature limit sensing electrical conductor (16) located in the protected space is equipped with at least one temperature limit sensing unit (22),
the extinguishing activating unit (17) is connected to the activating valve (13) through an electrical conductor (19), and the extinguishing agent pipe (14) and the temperature limit sensing electrical conductor (16) are arranged alongside each other in the protected space.

2. The fixed fire-fighting equipment according to claim 1, wherein the openings (15) are dimensioned according to the geometry of the protected space.

3. The fixed fire-fighting equipment according to claims 1-2, wherein the openings (15) in the extinguishing agent pipe are nozzles.

4. The fixed fire-fighting equipment according to claim 1, wherein the temperature limit sensing electrical conductor (16) is equipped with temperature limit sensing units (22) by storey.

5. The fixed fire-fighting equipment according to claims 1-4, wherein at least one manual electrical signalling device (18) is connected to the extinguishing activating unit (17) in a releasable manner through the electrical conductor (19).



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EUROPEAN SEARCH REPORT

Application Number
EP 09 00 5107

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 603 403 A (HORWINSKI ELWOOD R) 7 September 1971 (1971-09-07) * column 2, lines 25-37 * * column 2, lines 53-62 * * column 4, lines 43-63 * * column 5, lines 30-47; figures 1-5 * -----	1-4	INV. A62C35/62
X	US 4 453 155 A (COOPER GARY D [US]) 5 June 1984 (1984-06-05) * column 4, lines 6-20 * * column 4, line 48 - column 5, line 33 * * column 6, lines 38-43 * * column 9, line 30 - column 10, line 28 * * column 10, lines 63-68; figures * -----	1-3	
A	GB 08909 A A.D. 1911 (GRAAFF WILHELM [DE]) 8 February 1912 (1912-02-08) * page 2, lines 2-14 * * page 2, lines 23-37; figure 1 * -----	5	
A	US 5 186 260 A (SCOFIELD WILLIAM A [US]) 16 February 1993 (1993-02-16) * column 3, lines 2-20 * -----		TECHNICAL FIELDS SEARCHED (IPC) A62C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 July 2009	van Bilderbeek, Henk

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-07-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3603403 A	07-09-1971	NONE	
US 4453155 A	05-06-1984	NONE	
GB 191108909 A	08-02-1912	NONE	
US 5186260 A	16-02-1993	US 5355026 A	11-10-1994

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 200238 A **[0004]**
- WO 224146 A **[0005]**
- WO 214557 A **[0006]**
- WO E000678 A **[0007] [0008]**