

## Search strategy

## Query

..SEMSEARCH "A CENTER" 29 "A CENTER TO CENTER SPACING" 30 "ACTUATION" 9 "ACTUATION ASSEMBLY" 46 "ALARM" 7 "ALARM CONDITION" 18 "ANALOG SENSOR" 18 "AUXILIARY" 9 "BATTERY" 16 "BATTERY BACKUP" 18 "BOARD" 30 "BOUSING" 7 "BUS" 12 "BUS DETECTION" 9 "BUS LENGTH" 8 "BUS RELEASE" 42 "CABLE" 7 "CENTER TO CENTER SPACING" 10 "CENTRAI CONTROLLER" 10 "CENTRAL CONTROLLER" 77 "CENTRALIZED CONTROLLER" 30 "CONNECTION" 8 "CONNECTOR" 83 "CONNECTOR IISCIUDE" 11 "DAIA WIRE" 8 "DATA BUS" 89 "DATA WIRE" 23 "DETECTION CIRCUIT" 18 "DETECTOR" 7 "DISPLAY BUS" 17 "ELECTRIC PNEUMATIC ACTUATOR" 31 "ELECTRICAL ACTUATION" 9 "ELECTRTC PNEURNATIC ACTUATOR" 11 "FAULT CONDITION" 27 "FEEDBACK" 7 "FEEL" 6 "FEMALE CONNECTOR" 9 "FIRE" 13 "FIRE DETECTED CONDITION" 10 "FIRE DETECTION" 8 "FIRE DETECTION BUS" 38 "FIRE PROTECTION" 9 "FIRE SUPPRESSION" 100 "FIRE SUPPRESSION AGENT" 20 "HAZARD AREA" 32 "HISTORY LOG" 8 "HOLE" 12 "HOUSING" 16 "INFRARED SENSOR" 9 "LCD DISPLAY" 8 "MALE CONNECTOR" 9 "MANUAL ACTUATION" 28 "MANUAL RELEASE" 17 "MAXIMUM" 7 "MAXIMUM BUS LENGTH" 19 "MEMBRANE SWITCH" 9 "MICROPROCESSOR" 9 "MODULE HOUSING" 9 "MODULE INTERCONNECTION" 10 "MODULE MICROPROCESSOR" 11 "MODULE PCB" 11 "MONITORING CIRCUIT" 19 "MOUNTING PAD" 25 "NORMA L CONDITION" 9 "NORMAL STATE" 8 "OHM" 29 "OPEN CIRCUIT" 17 "OPTICAL SENSOR" 9 "PCB" 100 "POWER BUS" 8 "POWER MODULE" 26 "POWER PAD MOUNTING" 28 "POWER WIRE" 47 "PRESSURE SWITCH" 9 "PROTRACTION" 8 "READY CONDITION SIGNAL" 10 "RELAY MODULE" 8 "RELEASE CIRCUIT" 10 "RELEASING CIRCUIT" 18 "RESPONSE" 9 "SERIAL CONNECTION" 37 "SOLDER" 7 "STATE DETECTION" 9 "SUPPLY" 7 "SUPPRESSANT RELEASE" 10 "SYSTEM STATUS" 10 "TEN MAXIMUM" 9 "TERMINAL" 16 "THERMAL DETECTOR" 18 "THREADED CIRCULAR CONNECTOR" 10 "TOR DETECTING" 8 "TWIST" 12 "TWIST RATE" 16 "TWO MINIMUM BEND RADIUS" 10 "TYPE SIGNAL" 9 "USB PORT" 8 "USER INTERFACE BUS" 19 "USER INTERFACE DISPLAY" 10 "VARIABLE RESISTANCE" 30 "WIRE" 24

## 20 Documents

| Publication numbers              | Title                                                                                                 | Current assignees             |
|----------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------|
| <a href="#">EP3440649 A1</a>     | Modular and expandable fire suppression system                                                        | TYCO FIRE PRODUCTS            |
| <a href="#">EP2897694 A1</a>     | Fire suppression systems and methods                                                                  | TYCO FIRE PRODUCTS            |
| <a href="#">EP3151926 A1</a>     | Manual actuator for fire suppression systems                                                          | TYCO FIRE PRODUCTS            |
| <a href="#">US3993138 A</a>      | Fire prevention system                                                                                | US DEPARTMENT OF THE INTERIOR |
| <a href="#">CN101947373 A</a>    | Automatic fire protection system for car                                                              | HUA WEI                       |
| <a href="#">EP2501442 A1</a>     | Firefighting system for a rail vehicle                                                                | FOGTEC BRANDSCHUTZ            |
| <a href="#">EP2727631 A1</a>     | Fire sensor, fire detection system, fire suppression system, and combinations thereof                 | FEDERAL EXPRESS               |
| <a href="#">EP2919864 A1</a>     | Sound and light intensity profile analysis for fire location detection                                | MARIOFF                       |
| <a href="#">EP2603292 A2</a>     | High speed automatic fire suppression system and method                                               | TYCO FIRE PRODUCTS            |
| <a href="#">EP3126014 A2</a>     | Electric-pneumatic actuator assembly                                                                  | TYCO FIRE PRODUCTS            |
| <a href="#">GB200419162 D0</a>   | Distributed Monitoring and Control System                                                             | TTS ELECTRONICS               |
| <a href="#">US5186260 A</a>      | Wire-sensored residential range hood fire extinguisher system                                         | PEM ALL FIRE EXTINGUISHER     |
| <a href="#">US20150367157 A1</a> | System, Method, Apparatus, and Computer Program Product for Testing a Vehicle Fire Suppression System | MCWANE                        |
| <a href="#">US6039124 A</a>      | Electrical detector actuated magazine sprinkler (EDAMS) system                                        | US NAVY                       |
| <a href="#">WO200368323 A1</a>   | Modular fire detection and extinguishing system                                                       | AUTOLIV                       |
| <a href="#">EP2343105 A2</a>     | Highly integrated data bus automatic fire extinguishing system                                        | KIDDE TECHNOLOGIES            |
| <a href="#">EP2603291 A1</a>     | Valve for a fire extinguishing system                                                                 | TYCO FIRE PRODUCTS            |
| <a href="#">US5864287 A</a>      | Alarms for monitoring operation of sensors in a fire-suppression system                               | SOFTQUAD                      |
| <a href="#">US20040084193 A1</a> | Automatic anti-fire apparatus for vehicles                                                            | TSENG JING SHIONG             |
| <a href="#">EP1428190 A1</a>     | A fire detection system                                                                               | GOODRICH                      |

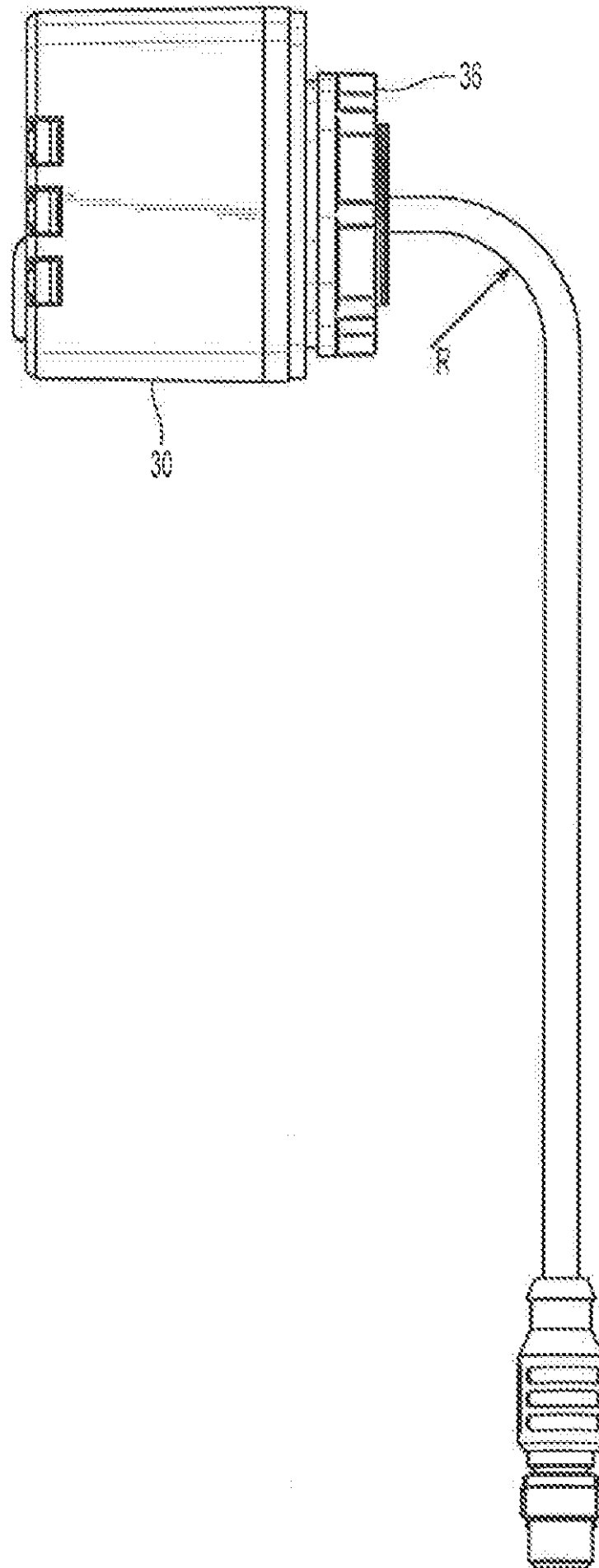
Family 1/20 - FAMPAT - ©Questel

**Title**

(EP3440649)

Modular and expandable fire suppression system

**Images**



**Publication numbers with kind code & date**

|                |    |            |                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|----------------|----|------------|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| EP3440649      | B1 | 2020-01-29 | EP3440649      |  |  |  |  |
| PE20190490     | A1 | 2019-04-09 | PE049002019    |  |  |                                                                                     |  |
| US20190091501  | A1 | 2019-03-28 | US20190091501  |  |  |  |  |
| CN109478362    | A  | 2019-03-15 | CN109478362    |  |  |  |  |
| EP3440649      | A1 | 2019-02-13 | EP3440649      |  |  |  |  |
| MX2018012245   | A  | 2019-02-07 | MX2018012245   |  |  |                                                                                     |  |
| BR112018070375 | A2 | 2019-02-05 | BR112018070375 |  |  |  |  |
| CL2018002833   | A1 | 2019-01-18 | CL201802833    |  |  |                                                                                     |  |
| CO2018011419   | A2 | 2018-11-13 | CO2018011419   |  |  |                                                                                     |  |
| IN201847040923 | A  | 2018-11-09 | IN201847040923 |  |  |  |  |
| AU2017248279   | A1 | 2018-10-18 | AU2017248279   |  |  |  |  |
| BR112018070375 | A1 | 2018-10-16 | BR112018070375 |  |  |  |  |
| CA3020331      | A1 | 2017-10-12 | CA3020331      |  |  |  |  |
| WO2017/177031  | A1 | 2017-10-12 | WO2017177031   |  |  |  |  |

**IPC - International classification**

A62C-037/36; A62C-037/36; G08B-005/36; G08B-017/06; G08B-017/12; G08B-025/04

**Abstract**

(EP3440649)

A tire suppression system includes a centralized controller and a plurality of modules (14). Each module includes a housing (30), a printed circuit board (32) with a mounted microprocessor (34), a first connector (36) including a first pair of data wires (38) mounted to the board; and a second connector (40) including a second pair of data wires (42) mounted to the board so that the printed circuit board electrically connects the first and second pairs of data wires. The modules are interconnected with the central controller to define data buses for centralized fire detection, user interface and system response. The connectors of each module interconnect the plurality of modules in series to the central controller.

**Inventors**

FERNSTRUM MARVIN B

COUNTS BRIAN LEE

**Latest standardized assignees - inventors removed**

TYCO FIRE PRODUCTS

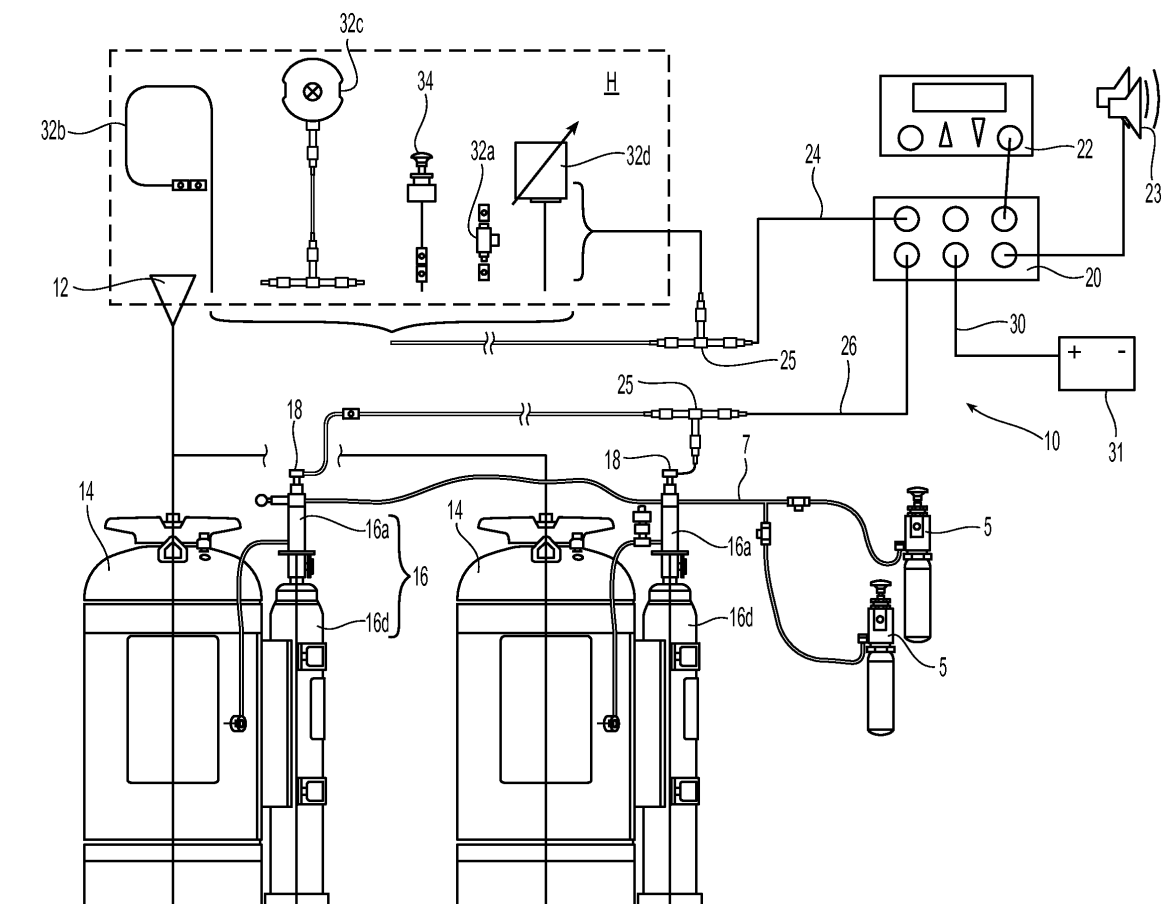
Family 2/20 - FAMPAT - ©Questel

**Title**

(EP2897694)

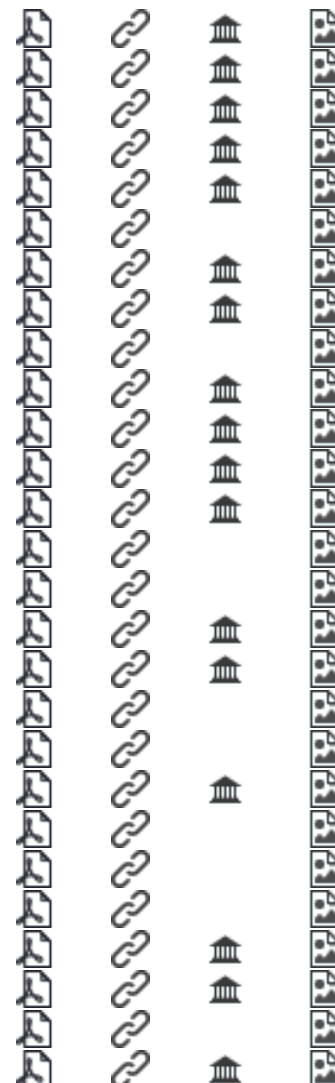
Fire suppression systems and methods

**Images**



#### Publication numbers with kind code & date

|                   |    |            |                |
|-------------------|----|------------|----------------|
| EP2897698         | B1 | 2020-01-08 | EP2897698      |
| AU2017248579      | B2 | 2019-10-31 | AU2017248579   |
| AU2017249290      | B2 | 2019-10-31 | AU2017249290   |
| CN104797302       | B  | 2019-03-12 | CN104797302B   |
| US20180369625     | A1 | 2018-12-27 | US20180369625  |
| RU2673623         | C2 | 2018-11-28 | RU2673623      |
| CN104780981       | B  | 2018-10-23 | CN104780981B   |
| US10039945        | B2 | 2018-08-07 | US10039945     |
| RU2015115204      | A3 | 2018-03-22 | RU2015115204   |
| AU2017248579      | A1 | 2017-11-09 | AU2017248579   |
| AU2017249290      | A1 | 2017-11-09 | AU2017249290   |
| BR112015006249    | A2 | 2017-07-04 | BR112015006249 |
| BR112015006285    | A2 | 2017-07-04 | BR112015006285 |
| RU2015115155      | A  | 2016-11-20 | RU2015115155   |
| RU2015115204      | A  | 2016-11-20 | RU2015115204   |
| IN2190/CHENP/2015 | A  | 2016-07-01 | IN2015CN02190  |
| IN2256/CHENP/2015 | A  | 2016-07-01 | IN2015CN02256  |
| HK1213211         | A1 | 2016-06-30 | HK1213211      |
| HK1212937         | A1 | 2016-06-24 | HK1212937      |
| EP2897694         | A4 | 2016-05-11 | EP2897694      |
| MX2015003555      | A  | 2015-10-09 | MX2015003555   |
| MX2015003558      | A  | 2015-10-09 | MX2015003558   |
| CO7400874         | A2 | 2015-09-30 | CO7400874      |
| US20150251031     | A1 | 2015-09-10 | US20150251031  |
| US20150231431     | A1 | 2015-08-20 | US20150231431  |
| CL2015000726      | A1 | 2015-08-07 | CL2015000726   |
| EP2897694         | A1 | 2015-07-29 | EP2897694      |



|                |    |            |                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
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| EP2897698      | A2 | 2015-07-29 | EP2897698      |   |   |   |   |
| CN104797302    | A  | 2015-07-22 | CN104797302    |  |  |  |  |
| CN104780981    | A  | 2015-07-15 | CN104780981    |  |  |  |  |
| AU2013317755   | A8 | 2015-04-30 | AU2013317755   |  |  |  |  |
| AU2013317760   | A1 | 2015-04-30 | AU2013317760   |  |  |  |  |
| AU2013317755   | A1 | 2015-04-09 | AU2013317755   |  |  |  |  |
| BR112015006249 | A1 | 2015-04-07 | BR112015006249 |  |  |  |  |
| BR112015006285 | A1 | 2015-04-07 | BR112015006285 |  |  |  |  |
| WO2014/047574  | A3 | 2014-06-05 | WO201447574    |  |  |  |  |
| CA2885226      | A1 | 2014-03-27 | CA2885226      |  |  |  |  |
| CA2885299      | A1 | 2014-03-27 | CA2885299      |  |  |  |  |
| WO2014/047574  | A2 | 2014-03-27 | WO201447574    |  |  |  |  |
| WO2014/047579  | A1 | 2014-03-27 | WO201447579    |  |  |  |  |

**IPC - International classification**

A62C; A62C-003/07; A62C-027/00; A62C-035/64; A62C-037/00; A62C-037/10; A62C-037/36; A62C-037/36; B60R; B60R-016/03; G05B; G05B-015/02; G05B-019/042; G05D-007/06

**Abstract**

(EP2897694)

Fire suppression systems for vehicles and industrial applications including arrangements of an input bus and output bus coupled to a centralized controller to provide for automatic and manual detection of a fire and manual and automatic system actuation in response to the fire. The arrangements further provide for system information regarding the status and operation of the system components. Additionally, the arrangement of system components provide for expandability and programmability to configure the system for the protection of multiple and variable hazards using customized or programmed detection and/or actuation. The systems include configured connectors and color coded schemes to facilitate system installation.

**Inventors**

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FERNSTRUM MARVIN B  
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LILLEY GREGORY J  
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MYERS THOMAS JOHN  
BUSHERT JOHN S  
HACKL RICHARD J  
THORELL MARVIN D

**Latest standardized assignees - inventors removed**

TYCO FIRE PRODUCTS

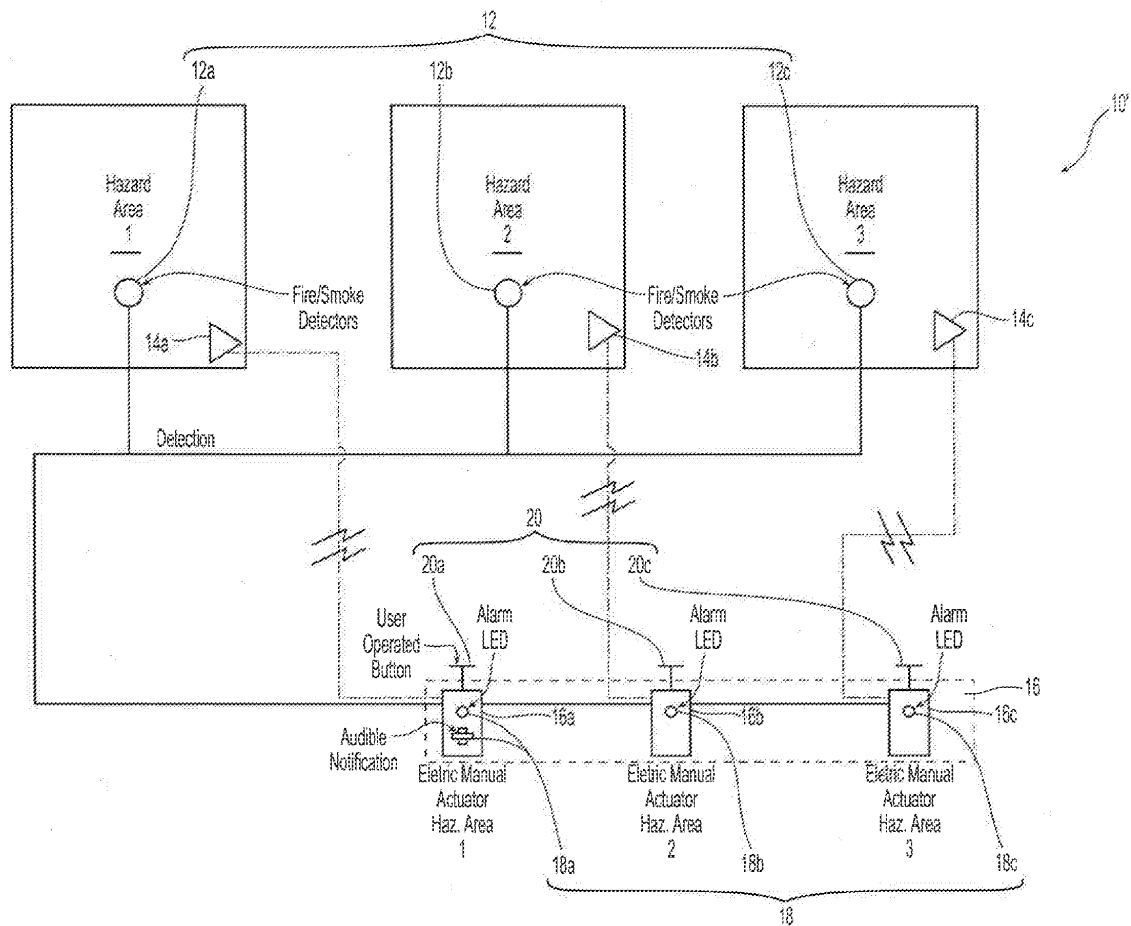
Family 3/20 - FAMPAT - ©Questel

**Title**

(EP3151926)

Manual actuator for fire suppression systems

**Images**



#### Publication numbers with kind code & date

|               |    |            |               |
|---------------|----|------------|---------------|
| US20170197102 | A1 | 2017-07-13 | US20170197102 |
| EP3151926     | A1 | 2017-04-12 | EP3151926     |
| WO2016/195622 | A1 | 2016-12-08 | WO2016195622  |



#### IPC - International classification

A62C-003/07; A62C-035/02; A62C-037/00; A62C-037/36; A62C-037/36; A62C-037/50; G08B-017/06; G08B-025/12

#### Abstract

(EP3151926)

Fire protection systems and methods for the protection of multiple areas of an occupancy. The system includes detectors for detecting a fire condition in an area of the occupancy and release assemblies for discharging a firefighting agent into a hazard area of the occupancy. The system includes a plurality of manual actuating devices to manually actuate the release assemblies. Each of the manual actuating devices includes an indicator for visually and/or audibly identifying the manual actuating device for operation in response to a fire condition.

#### Inventors

SANDAHL DEREK M  
FERNSTRUM MARVIN B  
COUNTS BRIAN L

#### Latest standardized assignees - inventors removed

TYCO FIRE PRODUCTS

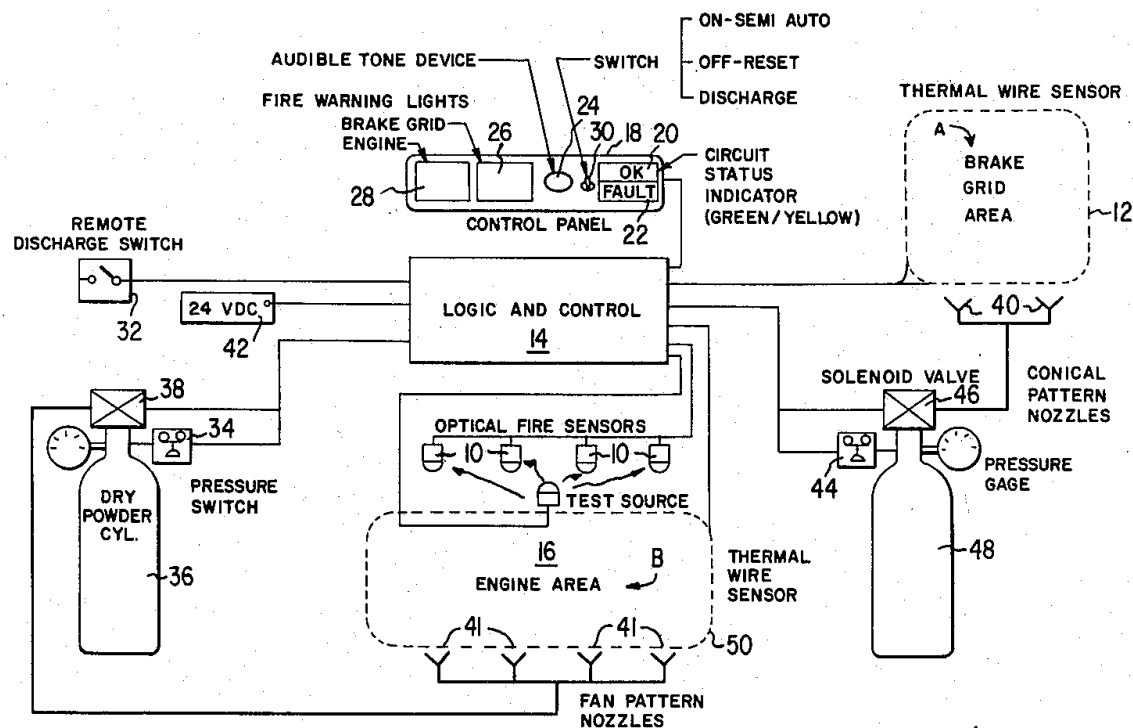
Family 4/20 - FAMPAT - ©Questel

#### Title

(US3993138)

Fire prevention system

#### Images



#### Publication numbers with kind code & date

US3993138

A

1976-11-23

US3993138



#### IPC - International classification

A62C-037/36; A62C-037/36; A62C-037/50

#### Abstract

(US3993138)

An automatic fire prevention system provides failsafe features as well as the capability of checking the operation of associated fire sensors. Multiple fire sensors, including thermal and optical types, are continually checked by a test circuit which simulates fire conditions. Detection of an actual fire causes an automatic control circuit, after a predetermined time delay, to activate a fire extinguishing device such as a dry powder chemical extinguisher. Logic circuitry distinguishes between true fires and fires simulated by the aforementioned test circuit. An operator can by-pass the automatic activation of the fire extinguishing device by means of a manual switch during the time delay period and can also manually discharge the fire extinguisher. Applications include the protection of mine haulage trucks so as to provide automatic fire extinguisher activation, continued self-checking and manual override features for a driver.

#### Inventors

STEVENS RALPH B

ODA WALTER S

#### Latest standardized assignees - inventors removed

US DEPARTMENT OF THE INTERIOR

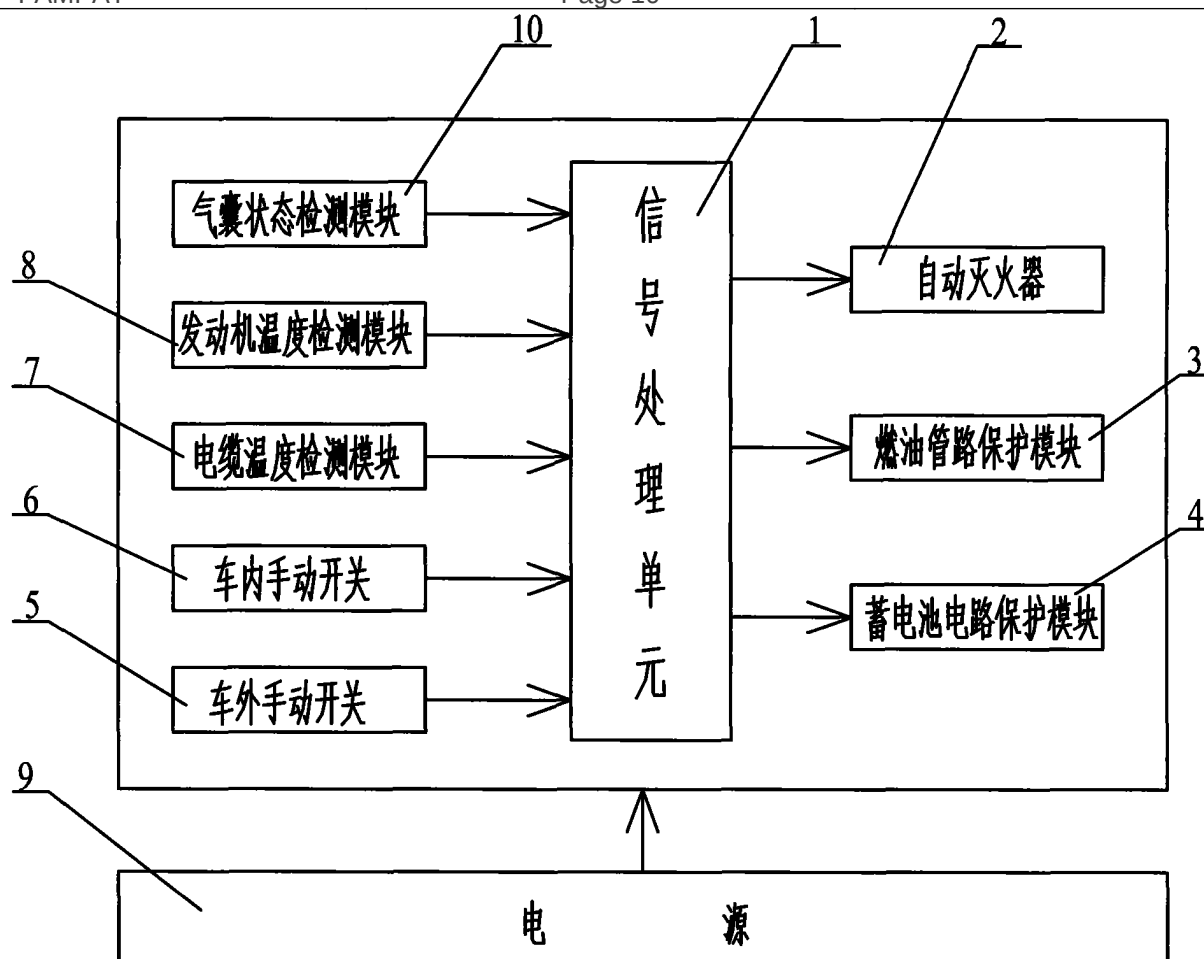
Family 5/20 - FAMPAT - ©Questel

#### Title

(CN101947373)

Automatic fire protection system for car

#### Images



#### Publication numbers with kind code & date

CN101947373

A

2011-01-19

CN101947373



#### IPC - International classification

A62C-003/07; A62C-037/36

#### Abstract

(CN101947373)

The patent refers to the field of 'fire prevention or containment; fire-extinguishing for particular objects or places'. This invention involves a kind of automatic fire protection system for car, it includes testing module of power, engine temperature, signal processing unit and automatic sprinkler; The stated power links with testing module, power end of the signal processing unit and automatic sprinkler of engine temperature separately; The testing module of engine temperature links with input end of the signal processing unit, the automatic sprinkler links with output terminal of the signal processing unit; The testing module of engine temperature, are used for measuring the temperature of the automobile engine, and transmit the stated temperature value to the signal processing unit; The signal processing unit is received and analyzed the temperature value that the testing module of engine temperature inputs, at the time of the temperature value that the temperature of measuring in the testing module of engine temperature presumes when larger than the signal processing unit, the signal processing unit outputs the fire extinguishing signal to the automatic sprinkler, make the automatic sprinkler spray the extinguishing agent to the automobile engine. This invention is simple in construction, easy to use, with low costs, it is safe and reliable.

#### Inventors

HUA WEI

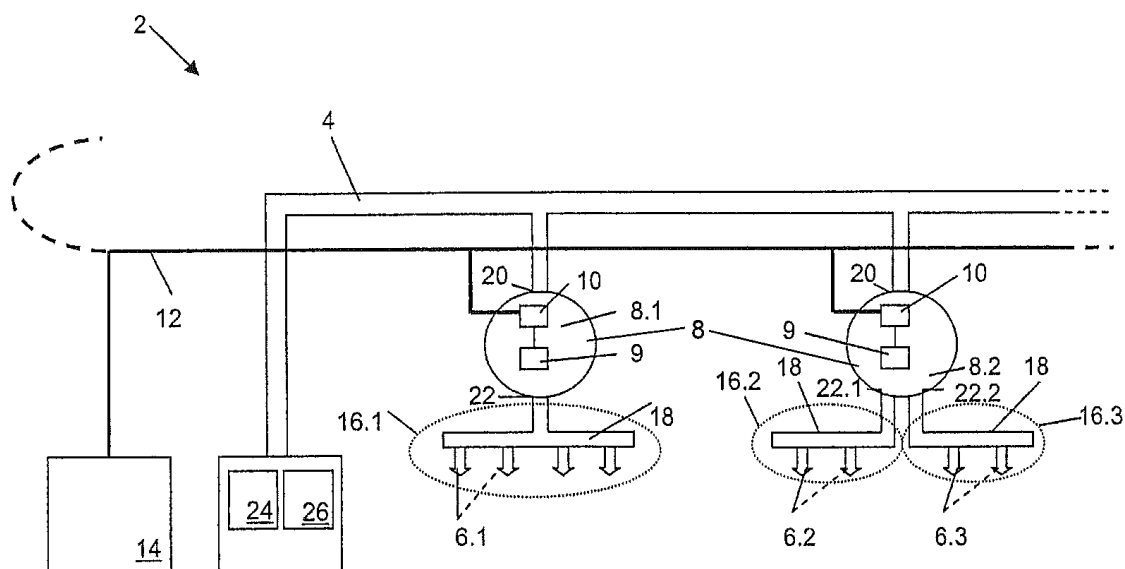
Family 6/20 - FAMPAT - ©Questel

#### Title

(EP2501442)

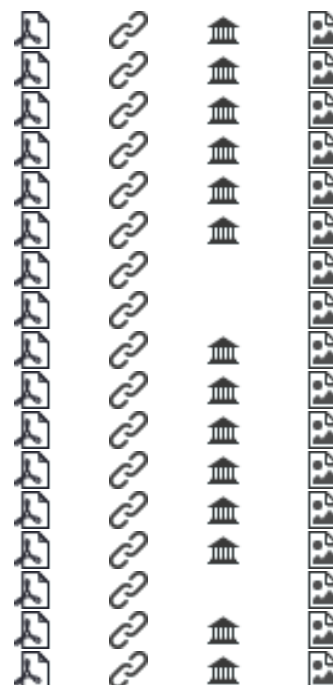
Firefighting system for a rail vehicle

#### Images



### Publication numbers with kind code & date

|                                   |    |            |                                |
|-----------------------------------|----|------------|--------------------------------|
| <a href="#">US10265557</a>        | B2 | 2019-04-23 | <a href="#">US10265557</a>     |
| <a href="#">DK2501442</a>         | T3 | 2016-06-27 | <a href="#">DK2501442T</a>     |
| <a href="#">ES2575213</a>         | T3 | 2016-06-27 | <a href="#">ES2575213</a>      |
| <a href="#">EP2501442</a>         | B1 | 2016-03-30 | <a href="#">EP2501442</a>      |
| <a href="#">BR112012011834</a>    | A2 | 2016-03-01 | <a href="#">BR112012011834</a> |
| <a href="#">CN102834145</a>       | B  | 2015-03-25 | <a href="#">CN102834145B</a>   |
| <a href="#">RU2508142</a>         | C1 | 2014-02-27 | <a href="#">RU2508142</a>      |
| <a href="#">RU2012125035</a>      | A  | 2013-12-27 | <a href="#">RU2012125035</a>   |
| <a href="#">JP2013511307</a>      | A  | 2013-04-04 | <a href="#">JP2013511307</a>   |
| <a href="#">IN1197/KOLNP/2012</a> | A  | 2013-01-25 | <a href="#">IN2012KN01197</a>  |
| <a href="#">CN102834145</a>       | A  | 2012-12-19 | <a href="#">CN102834145</a>    |
| <a href="#">BR112012011834</a>    | A1 | 2012-11-06 | <a href="#">BR112012011834</a> |
| <a href="#">US20120267126</a>     | A1 | 2012-10-25 | <a href="#">US20120267126</a>  |
| <a href="#">EP2501442</a>         | A1 | 2012-09-26 | <a href="#">EP2501442</a>      |
| <a href="#">KR20120095438</a>     | A  | 2012-08-28 | <a href="#">KR20120095438</a>  |
| <a href="#">WO2011/061037</a>     | A1 | 2011-05-26 | <a href="#">WO201161037</a>    |
| <a href="#">DE102009053551</a>    | A1 | 2011-05-19 | <a href="#">DE102009053551</a> |



### IPC - International classification

A62C-003/07; A62C-031/02; A62C-035/58; A62C-037/00; B61K-013/00

### Abstract

(EP2501442)

The invention relates to a firefighting system (2) in particular for a rail vehicle having a supply line (4) for supplying at least one extinguishing nozzle (6.1, 6.2, 6.3) using extinguishing fluid, wherein at least one zone valve (8.1, 8.2) is arranged between the extinguishing nozzle and the supply line (4), wherein the zone valve comprises a signal processing means (10.1, 10.2) for controlling an actuator (9) of the zone valve, wherein the signal processing means can be connected electrically to a central control unit (14) via a data communication network (12).

### Inventors

VOLK ANDREAS

DIRKSMEIER ROGER

### Latest standardized assignees - inventors removed

FOGTEC BRANDSCHUTZ

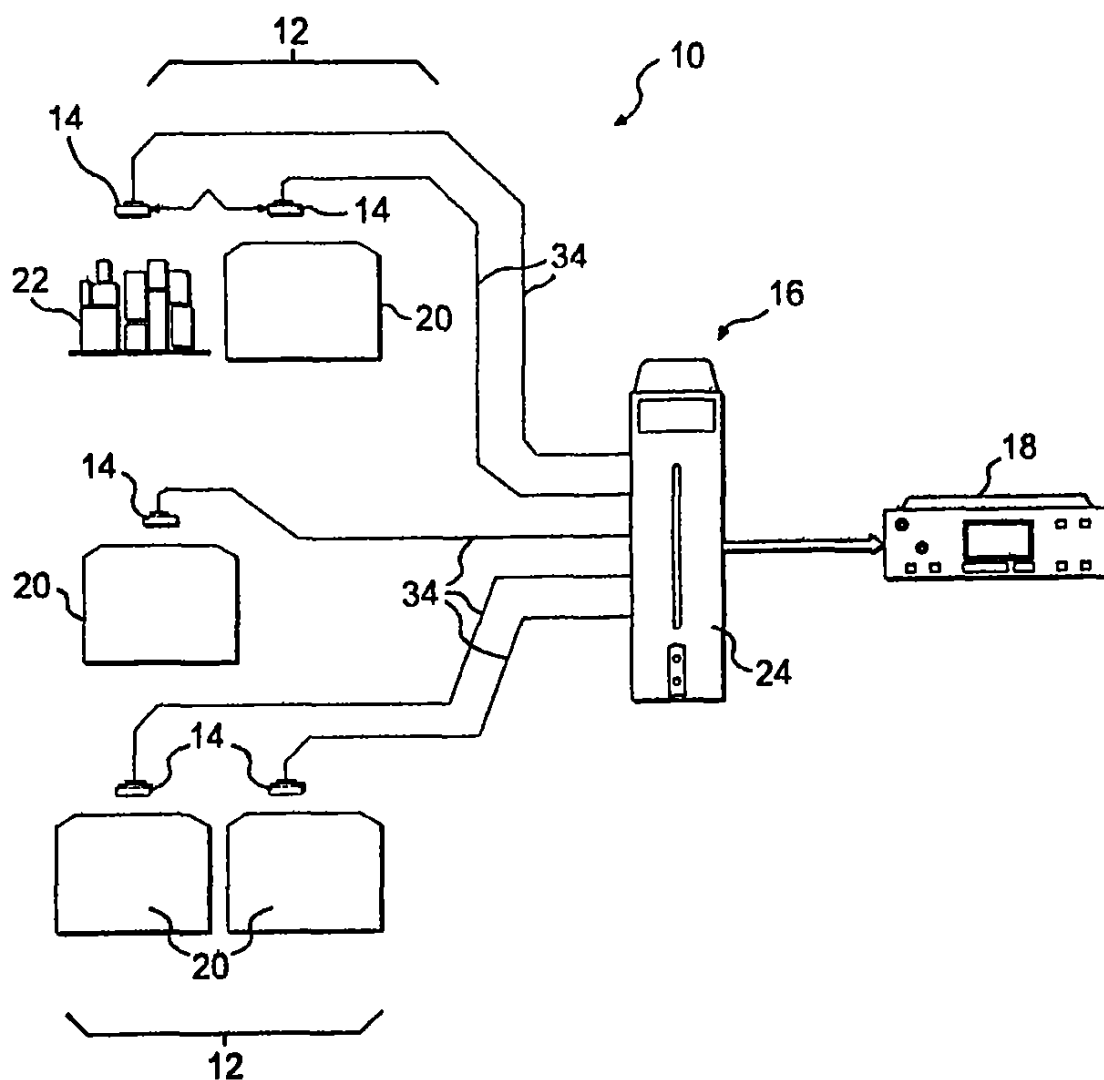
Family 7/20 - FAMPAT - ©Questel

Title

(EP2727631)

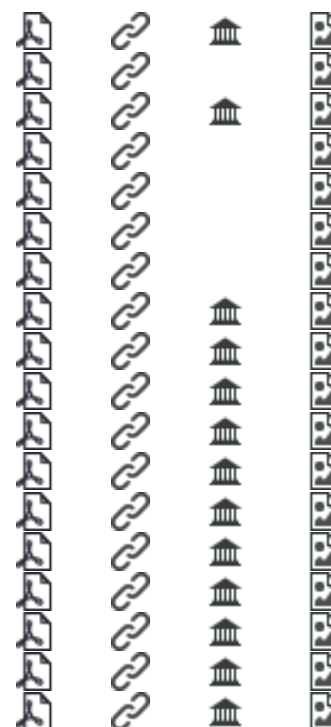
Fire sensor, fire detection system, fire suppression system, and combinations thereof

## Images



## Publication numbers with kind code &amp; date

|               |    |            |               |
|---------------|----|------------|---------------|
| CA2851759     | C  | 2016-10-11 | CA2851759     |
| HK1165350     | A1 | 2016-06-17 | HK1165350     |
| CA2620794     | C  | 2016-05-10 | CA2620794     |
| HK1164195     | A1 | 2016-02-05 | HK1164195     |
| PH12015500984 | A1 | 2015-09-07 | PH12015500984 |
| PH12015500984 | B1 | 2015-09-07 | PH12015500984 |
| HK1117783     | A1 | 2015-06-12 | HK1117783     |
| CN102247677   | B  | 2015-04-01 | CN102247677B  |
| US8905633     | B2 | 2014-12-09 | US8905633     |
| EP1928559     | B1 | 2014-10-15 | EP1928559     |
| EP2727631     | A1 | 2014-05-07 | EP2727631     |
| EP2727632     | A1 | 2014-05-07 | EP2727632     |
| JP5438156     | B2 | 2013-12-20 | JP5438156     |
| JP5107923     | B2 | 2012-10-12 | JP5107923     |
| JP2012142009  | A  | 2012-07-26 | JP2012142009  |
| CN101291707   | B  | 2012-06-13 | CN101291707B  |
| AU2006285044  | B2 | 2012-05-31 | AU2006285044  |
| CN102247677   | A  | 2011-11-23 | CN102247677   |



|                                   |    |            |               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------------|----|------------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <a href="#">BRPI0615296</a>       | A2 | 2011-05-17 | BR200615296   |   |   |   |   |
| <a href="#">US7810577</a>         | B2 | 2010-10-12 | US7810577     |  |  |  |  |
| <a href="#">US7806195</a>         | B2 | 2010-10-05 | US7806195     |  |  |  |  |
| <a href="#">US20090315726</a>     | A1 | 2009-12-24 | US20090315726 |  |  |  |  |
| <a href="#">US20090084561</a>     | A1 | 2009-04-02 | US20090084561 |  |  |  |  |
| <a href="#">JP2009506458</a>      | A  | 2009-02-12 | JP2009506458  |  |  |  |  |
| <a href="#">IN1301/KOLNP/2008</a> | A  | 2008-12-26 | IN2008KN01301 |  |  |  |  |
| <a href="#">CN101291707</a>       | A  | 2008-10-22 | CN101291707   |  |  |  |  |
| <a href="#">EP1928559</a>         | A1 | 2008-06-11 | EP1928559     |  |  |  |  |
| <a href="#">AU2006285044</a>      | A1 | 2007-03-08 | AU2006285044  |  |  |  |  |
| <a href="#">CA2620794</a>         | A1 | 2007-03-08 | CA2620794     |  |  |  |  |
| <a href="#">CA2851759</a>         | A1 | 2007-03-08 | CA2851759     |  |  |  |  |
| <a href="#">WO2007/027600</a>     | A1 | 2007-03-08 | WO200727600   |  |  |  |  |
| <a href="#">US20070044979</a>     | A1 | 2007-03-01 | US20070044979 |  |  |  |  |

**IPC - International classification**

A62C; A62C-003/07; A62C-003/08; A62C-003/10; A62C-005/02; A62C-031/02; A62C-031/12; A62C-031/22; A62C-035/00; A62C-035/02; A62C-037/00; A62C-037/09; A62C-037/11; A62C-037/40; A62C-037/44; A62C-037/44; B64D-025/00; G01J-005/00; G08B-017/00; G08B-017/12

**Abstract**

(EP2727631)

A fire detection system (10) including a fire detection system configured to detect an undesirably high temperature associated with an area. The fire detection system may include a temperature sensor (14) including a temperature sensor array and a fire alerting system (16) associated with the temperature sensor. The fire alerting system may be configured to receive information from the temperature sensor and generate a warning signal based on an undesirably high temperature associated with the area. The fire detection system may include a fire control panel (18) configured to receive the warning signal.

**Inventors**

POPP JAMES B

BENJAMIN ARTHUR J

**Latest standardized assignees - inventors removed**

FEDERAL EXPRESS

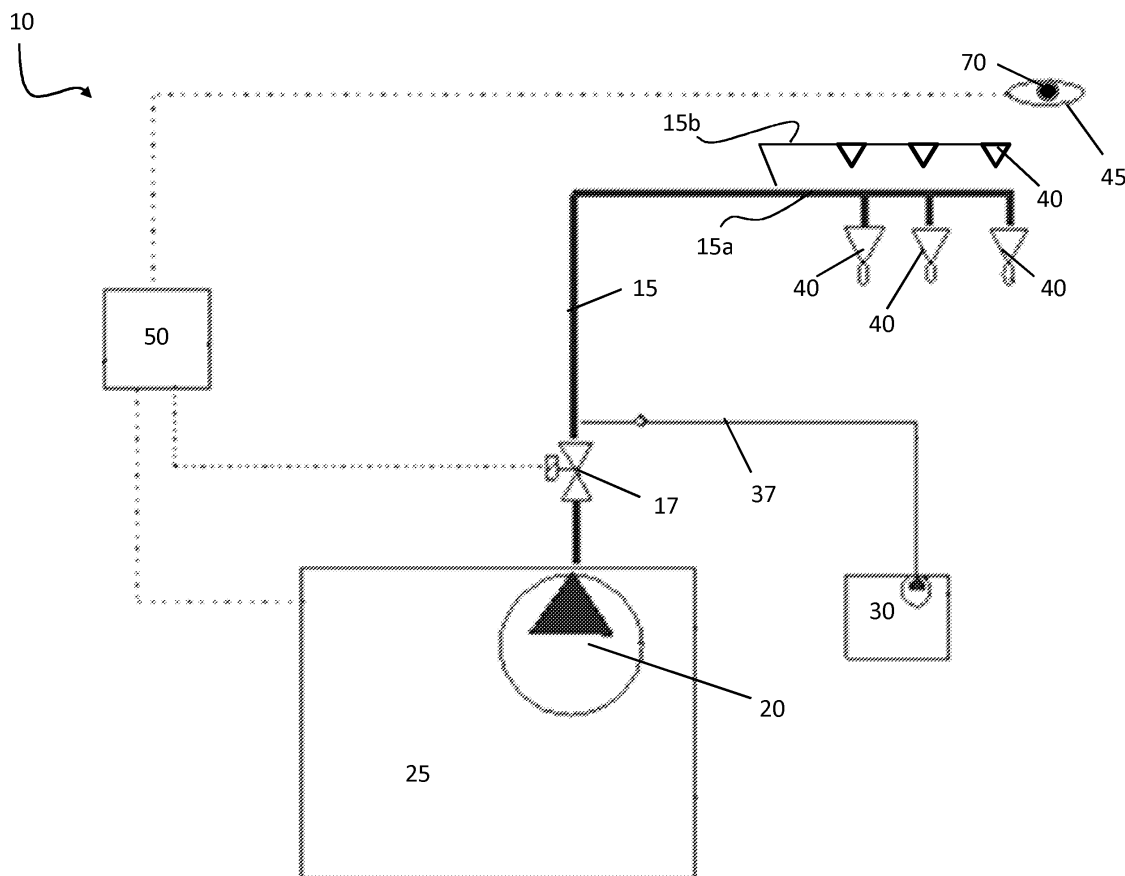
Family 8/20 - FAMPAT - ©Questel

**Title**

(EP2919864)

Sound and light intensity profile analysis for fire location detection

**Images**



#### Publication numbers with kind code & date

|                               |    |            |               |
|-------------------------------|----|------------|---------------|
| <a href="#">US20150273257</a> | A1 | 2015-10-01 | US20150273257 |
| <a href="#">CN104955531</a>   | A  | 2015-09-30 | CN104955531   |
| <a href="#">EP2919864</a>     | A1 | 2015-09-23 | EP2919864     |
| <a href="#">WO2014/076349</a> | A1 | 2014-05-22 | WO201476349   |



#### IPC - International classification

A62C-035/58; A62C-037/36; A62C-037/36; G08B-017/12

#### Abstract

(EP2919864)

A fire suppression system is provided including at least one spray head. A drive source is coupled to the at least one spray head by a supply line. The supply line delivers an extinguishing medium to the at least one spray head. The system also includes at least three fire location sensors arranged at known positions and configured to detect waves emitted during a fire condition. A control unit is operably coupled to the drive source and the at least three fire location sensors. The control unit determines a position of the fire based on the known positions of the at least three fire location sensors and data collected by the at least three of fire location sensors adjacent the fire.

#### Inventors

NIKKARILA JUHA-PEKKA

#### Latest standardized assignees - inventors removed

MARIOFF

Family 9/20 - FAMPAT - ©Questel

#### Title

(EP2603292)

High speed automatic fire suppression system and method

#### Images



A62C-003/07; A62C-037/44; A62C-037/44

**Abstract**

(EP2603292)

An automatic fire suppressing system is preferably provided onboard a vehicle and is supplied with one or more fire suppressing agents that are discharged in response to detecting a fire threat. Preferred embodiments include high-speed valves for discharging the fire suppressing agent(s), optical detectors for detecting and evaluating fire threat conditions, and modules for monitoring and controlling the automatic fire suppressing system.

**Inventors**

FERNSTRUM MARVIN B

EHLERS JOSHUA L

COUNTS BRIAN L

BIEHL RICHARD J

HACKL RICHARD J

KREFT ANTHONY J

THORELL MARVIN D

BEYERL PAUL J

**Latest standardized assignees - inventors removed**

TYCO FIRE PRODUCTS

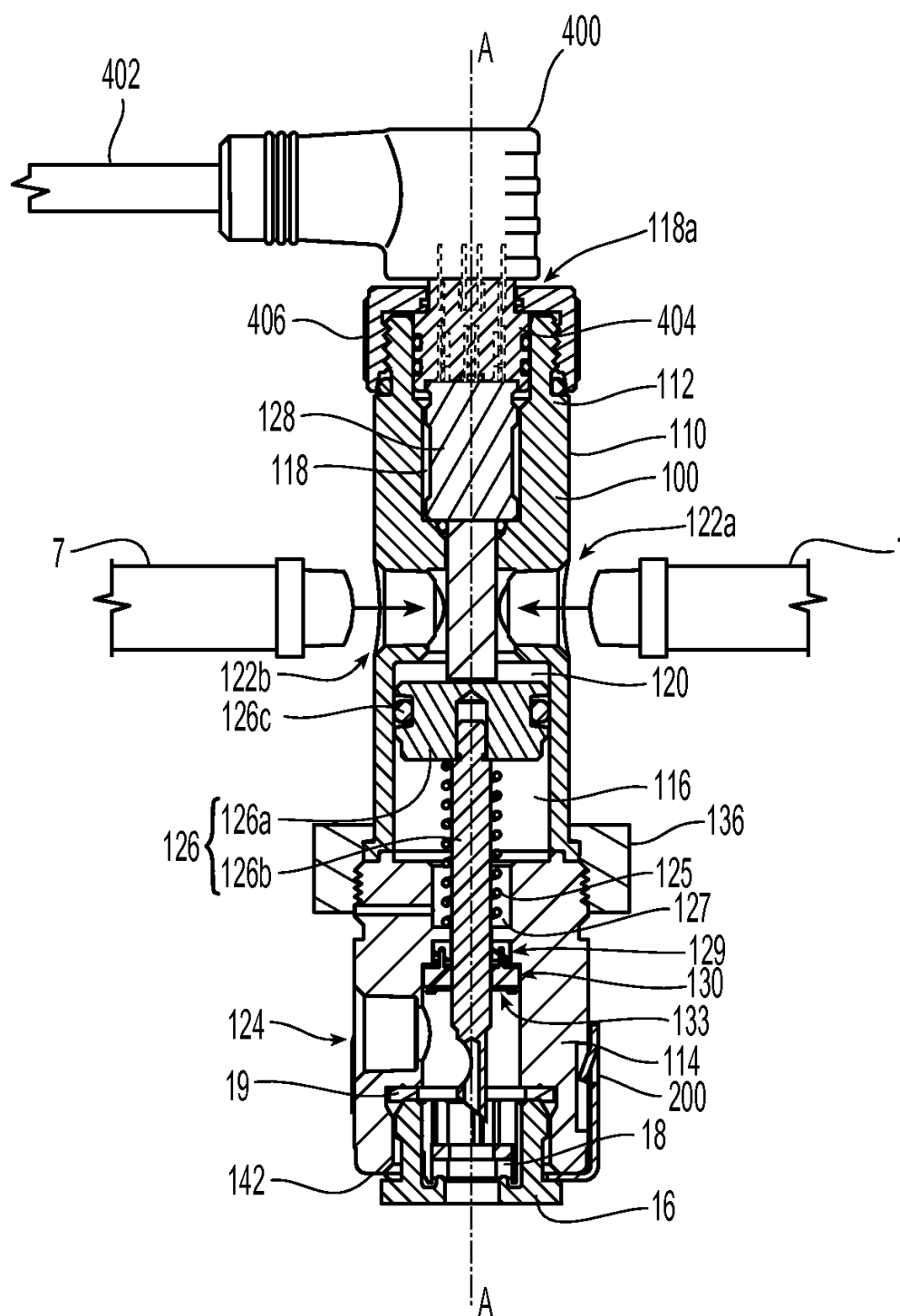
Family 10/20 - FAMPAT - ©Questel

**Title**

(EP3126014)

Electric-pneumatic actuator assembly

**Images**


**Publication numbers with kind code & date**

|                                |    |            |                |
|--------------------------------|----|------------|----------------|
| <a href="#">US20190358479</a>  | A1 | 2019-11-28 | US20190358479  |
| <a href="#">US10363447</a>     | B2 | 2019-07-30 | US10363447     |
| <a href="#">CN106535996</a>    | A  | 2017-03-22 | CN106535996    |
| <a href="#">EP3126014</a>      | A2 | 2017-02-08 | EP3126014      |
| <a href="#">US20170021213</a>  | A1 | 2017-01-26 | US20170021213  |
| <a href="#">IN201647036801</a> | A  | 2016-11-25 | IN201647036801 |
| <a href="#">AU2015240863</a>   | A1 | 2016-10-27 | AU2015240863   |
| <a href="#">AR099939</a>       | A1 | 2016-08-31 | AR--99939      |
| <a href="#">WO2015/153714</a>  | A3 | 2015-12-30 | WO2015153714   |



[WO2015/153714](#)

A2

2015-10-08

WO2015153714

**IPC - International classification**

A62C-003/07; A62C-035/02; A62C-035/11; A62C-037/46

**Abstract**

(EP3126014)

An actuator assembly for use in fire suppression systems for use in vehicle and industrial fire protection systems. The actuator assembly engages a cartridge of pressurized gas and releases the gas contained therein with a puncturing assembly. The actuator assembly includes a receptacle that controls the manner in which the actuator assembly and cartridge engage one another. The actuator assembly is configured for electrical and pneumatic actuation for rupturing the seal of the cartridge of pressurized gas. The actuator assembly has a housing that includes at least one inlet port that is coupled to a pressurized gas source, which is formed between a first chamber for electrical components sealed from the operative environment of the actuator assembly and a second chambers for the puncturing assembly. The actuator assembly allows for serial interconnection of multiple actuator assemblies for operation by a single source of pressurized gas.

**Inventors**

RYCZEK CHAD L

BIEHL RICHARD J

COUNTS BRIAN L

**Latest standardized assignees - inventors removed**

TYCO FIRE PRODUCTS

Family 11/20 - FAMPAT - ©Questel

**Title**

(GB2405514)

Distributed Monitoring and Control System

**Images**

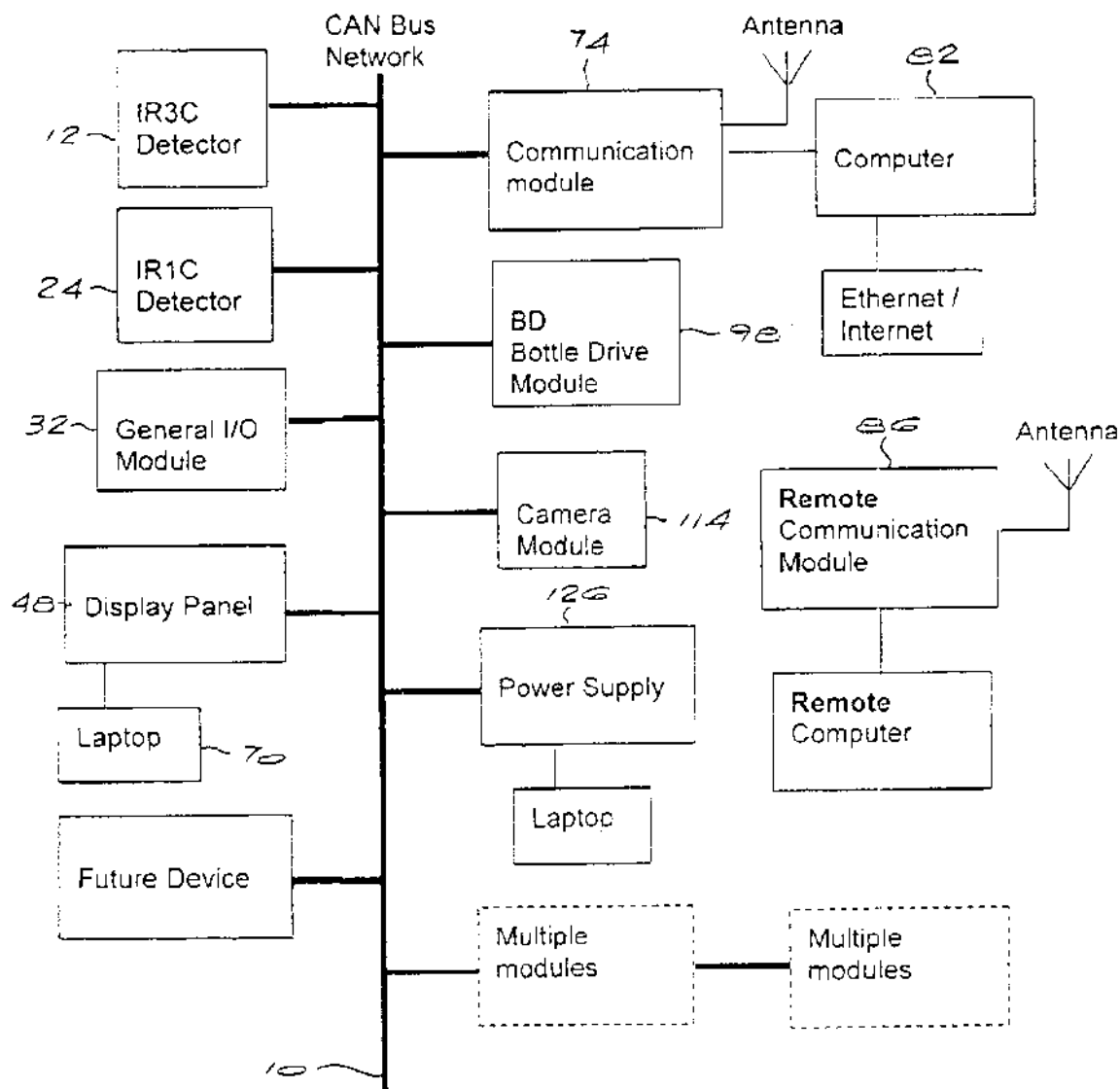


Fig.1

**Publication numbers with kind code & date**

|             |    |            |             |
|-------------|----|------------|-------------|
| GB2405514   | A  | 2005-03-02 | GB2405514   |
| ZA200409586 | B  | 2005-01-18 | ZA200409586 |
| GB0419162   | D0 | 2004-09-29 | GB200419162 |

**IPC - International classification**

G05B-023/02; G05B-023/02; G08B; G08B-017/00; G08B-025/00; G08B-029/18

**Abstract**

(GB0419162)

A modular monitoring and control system comprising a communication bus 10 for transferring data signals between modules of the system and for distributing electrical power to the modules. The system comprises a number of functional modules interconnected via the bus 10, including at least one fire and/or explosion detection module and at least one fire extinguishing module. Each functional module has a functional component, a processor for receiving and processing data from and/or sending data to the functional component, and a bus interface for transmitting data to and/or receiving data from other modules of the system. The modules are intended to operate without a central controller. The system also includes optional modules such as input/output modules, display modules, communications modules, surveillance modules and power supply modules. The system can be used in fire and explosion detection and suppression applications.

**Inventors**

DIPPENAAR ALWYN JACOBUS

HAARHOFF GUSTAF

WADE COLLIN

THOMSON GORDON CLIFFORD

**Latest standardized assignees - inventors removed**

TTS ELECTRONICS

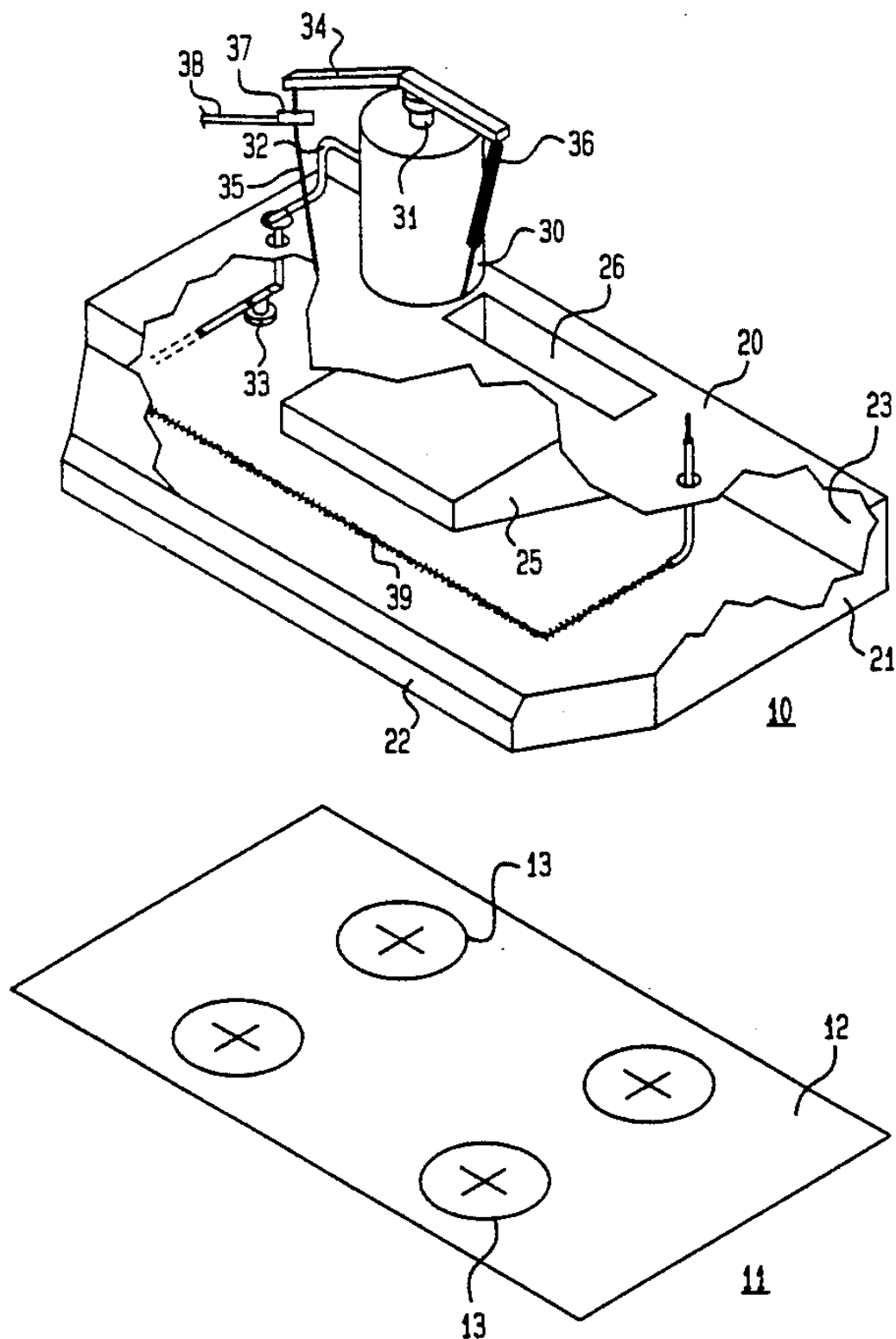
Family 12/20 - FAMPAT - ©Questel

**Title**

(US5186260)

Wire-sensored residential range hood fire extinguisher system

**Images**



#### Publication numbers with kind code & date

|                           |   |            |           |
|---------------------------|---|------------|-----------|
| <a href="#">US5355026</a> | A | 1994-10-11 | US5355026 |
| <a href="#">US5207276</a> | A | 1993-05-04 | US5207276 |
| <a href="#">US5186260</a> | A | 1993-02-16 | US5186260 |



#### IPC - International classification

A62C-003/00; A62C-037/40

#### Abstract

(US5186260)

A range hood positioned above a cooking range employs a continuous heat sensor system which includes twisted wires which are separated from one another by an insulator which is formed of a material which melts at a predetermined

temperature. The wires carry a supervisory current which also flows through an actuator, which may be an electrified system for cutting a tension wire. An indicator lamp, such as an LED, which may have a series resistor associated therewith, limits the current through the actuator to a level below the activation threshold of the actuator. Upon melting of the insulator, such as by the presence of a thermal hazard, a substantially short-circuit condition is produced which bypasses the current-controlling indicator LED, thereby applying an increased voltage across the actuator, as well as the current therethrough, to effect actuation of the actuator, whereby the actuator cuts the tension wire, permitting an actuation lever to be moved, and thereby causing a fire suppressant fluid to be discharged from a supply tank. Nozzles under the range hood direct the fire suppressant fluid, as desired.

**Inventors**

SCOFIELD WILLIAM A

**Latest standardized assignees - inventors removed**

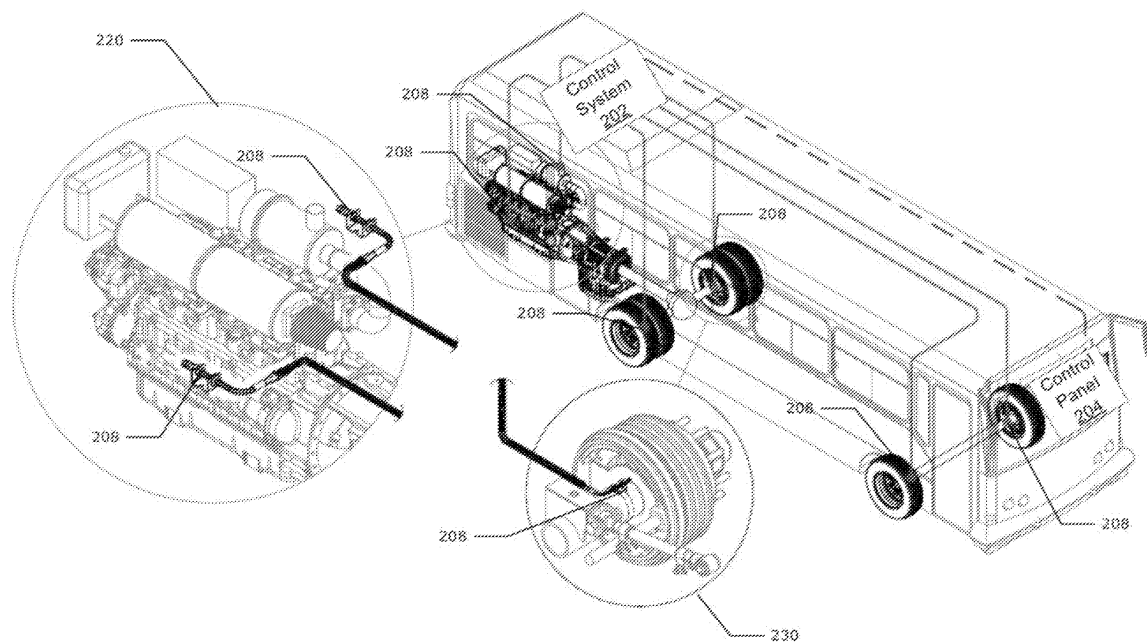
PEM ALL FIRE EXTINGUISHER

Family 13/20 - FAMPAT - ©Questel

**Title**

(US20150367157)

System, Method, Apparatus, and Computer Program Product for Testing a Vehicle Fire Suppression System

**Images****Publication numbers with kind code & date**[US20150367157](#)

A1 2015-12-24

US20150367157

**IPC - International classification**

A62C-003/07; A62C-035/11; A62C-037/50; G01K-013/00

**Abstract**

(US20150367157)

A system, method, apparatus, and computer program product for testing a vehicle fire suppression system are disclosed. A method may include testing components of the vehicle fire suppression system. The method may additionally include providing test results for each tested component.

**Inventors**

ROHLIK MICHAEL LAWRENCE

HUBBARD KENNETH ALAN

BEVINS JOHN EMMETT

## Latest standardized assignees - inventors removed

MCWANE

Family 14/20 - FAMPAT - ©Questel

## Title

(US6039124)

Electrical detector actuated magazine sprinkler (EDAMS) system

## Images

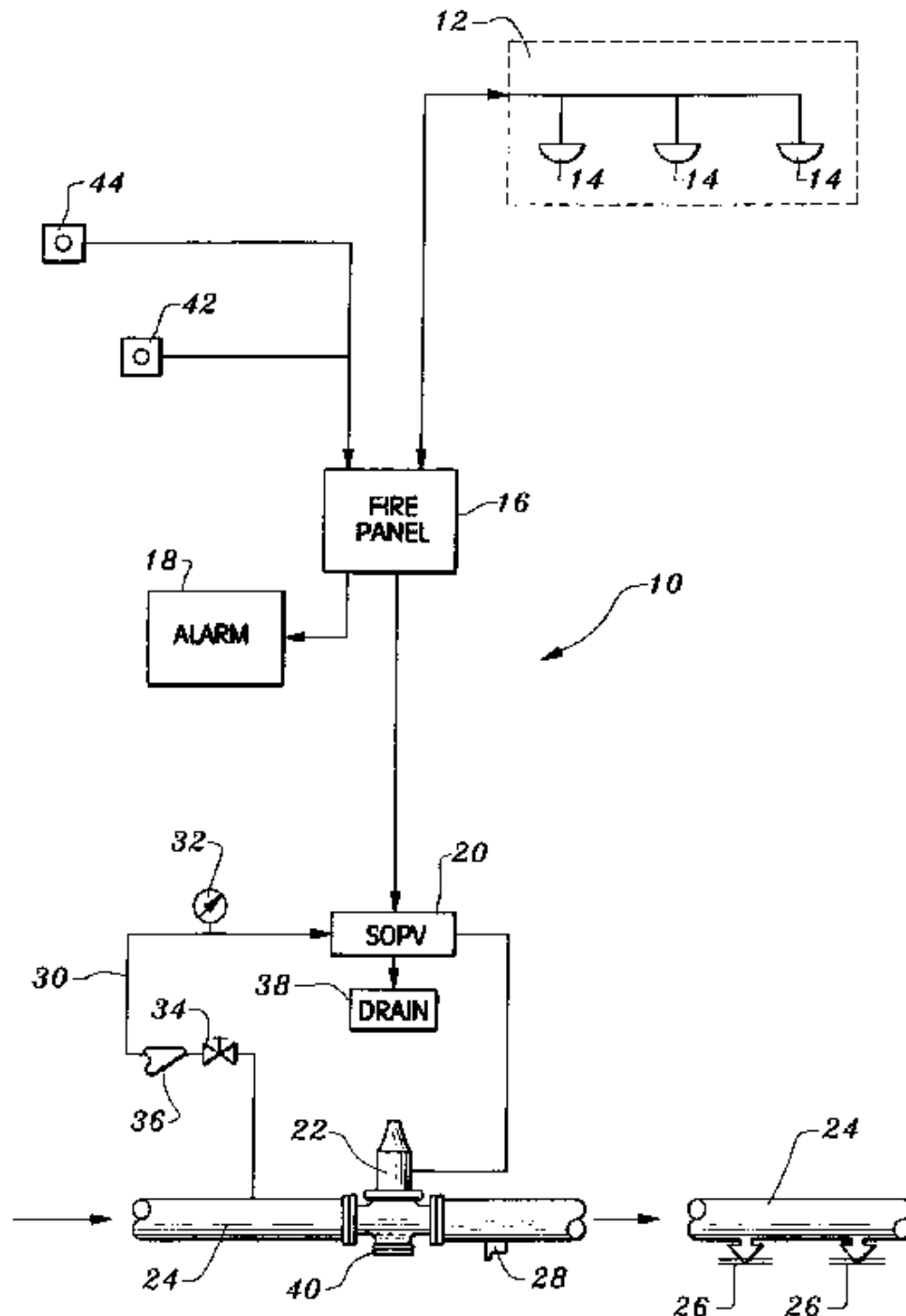


Fig. 1

Publication numbers with kind code &amp; date

[US6039124](#)

A 2000-03-21

US6039124



IPC - International classification

A62C-037/40; A62C-037/40

**Abstract**

(US6039124)

An fire protection system for use in shipboard magazines wherein electric heat detectors in a ship magazine provide temperature data to a fire panel. Upon detection of predetermined threshold temperatures, the fire panel initiates an alarm system and activates a fire sprinkler valve to apply water to fire sprinklers in the magazine. Temperature data from the heat sensors and stored weapon response data are used by a damage control system to generate graphic display data showing thermal conditions in the magazine and estimated times and temperatures at which stored munitions will undergo thermal destruction.

**Inventors**

BOWMAN HOWARD L

DARWIN ROBERT L

MARAFFIO WILLIAM R

SAWYER LARRY D

WILLIAMS ROBERT B

HUDSON FRANK E

HUNSTAD MARY

DECKER MARK W

**Latest standardized assignees - inventors removed**

US NAVY

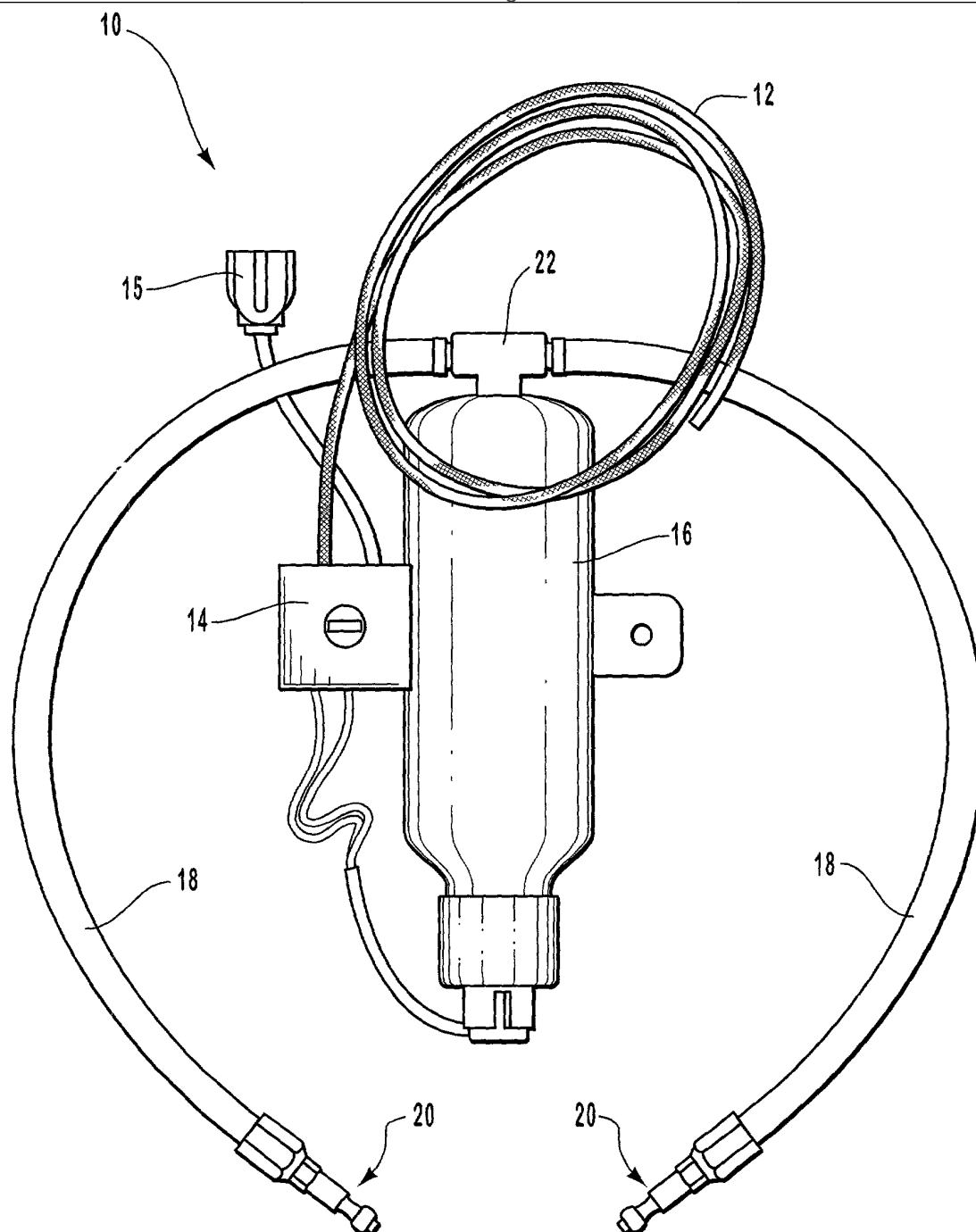
Family 15/20 - FAMPAT - ©Questel

**Title**

(WO200368323)

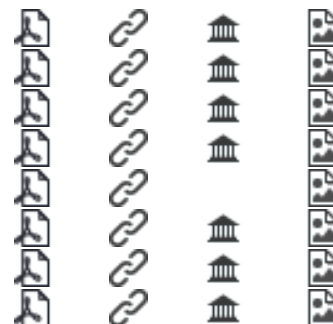
Modular fire detection and extinguishing system

**Images**



#### Publication numbers with kind code & date

|                               |    |            |                               |
|-------------------------------|----|------------|-------------------------------|
| <a href="#">US6981555</a>     | B2 | 2006-01-03 | <a href="#">US6981555</a>     |
| <a href="#">GB2400800</a>     | B  | 2005-08-31 | <a href="#">GB2400800</a>     |
| <a href="#">DE10392254</a>    | T5 | 2005-03-10 | <a href="#">DE10392254</a>    |
| <a href="#">GB2400800</a>     | A  | 2004-10-27 | <a href="#">GB2400800</a>     |
| <a href="#">GB0418558</a>     | D0 | 2004-09-22 | <a href="#">GB200418558</a>   |
| <a href="#">AU2003210944</a>  | A1 | 2003-09-04 | <a href="#">AU2003210944</a>  |
| <a href="#">WO03/068323</a>   | A1 | 2003-08-21 | <a href="#">WO200368323</a>   |
| <a href="#">US20030150625</a> | A1 | 2003-08-14 | <a href="#">US20030150625</a> |



#### IPC - International classification

A62C-003/07; A62C-003/08; A62C-013/66; A62C-013/68; A62C-035/00; A62C-037/00; A62C-037/10; A62C-037/40

#### Abstract

(WO03/068323)

A modular fire detection and extinguishing system (10) is disclosed that is inexpensive, compact, and modular to allow easy aftermarket installation in a variety of vehicles. The system (10) may include a detector (12), a trigger (14) coupled to

the detector (12) and a gas generant fire extinguisher (16), a modular distribution line (18) in fluid communication with the extinguisher (16) and a nozzle (20). The system (10) allows exhaust gas from the gas generant fire extinguisher (16) to carry dry powdered fire suppressant (40) from the fire extinguisher (16) and through the nozzle (20) to disperse the fire suppressant (40) substantially uniformly throughout a fire hazard zone. The extinguisher (16) is installed such that exhaust gas must aerate substantially all the fire suppressant (40) before exiting the extinguisher (16).

#### Inventors

SMITH BRADLEY

LINDSEY DAVID

CLARK MARCUS

#### Latest standardized assignees - inventors removed

AUTOLIV

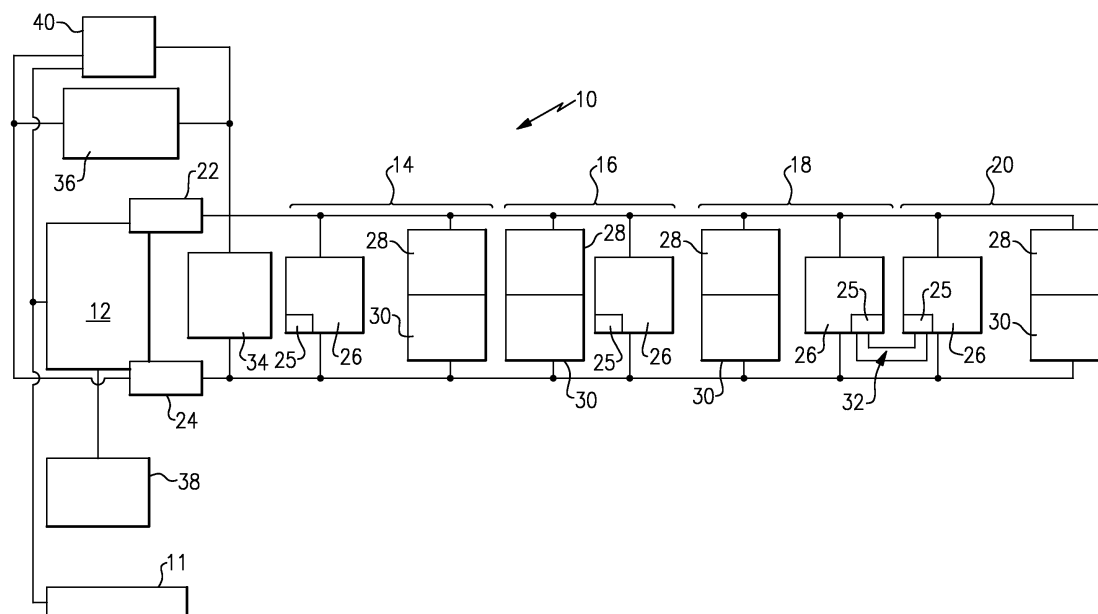
Family 16/20 - FAMPAT - ©Questel

#### Title

(EP2343105)

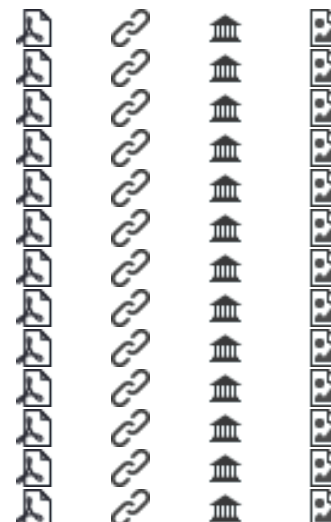
Highly integrated data bus automatic fire extinguishing system

#### Images



#### Publication numbers with kind code & date

|                               |    |            |               |
|-------------------------------|----|------------|---------------|
| <a href="#">ES2633962</a>     | T3 | 2017-09-26 | ES2633962     |
| <a href="#">ES2633781</a>     | T3 | 2017-09-25 | ES2633781     |
| <a href="#">EP2893960</a>     | B1 | 2017-07-12 | EP2893960     |
| <a href="#">EP2896433</a>     | B1 | 2017-07-05 | EP2896433     |
| <a href="#">US9412490</a>     | B2 | 2016-08-09 | US9412490     |
| <a href="#">ES2558746</a>     | T3 | 2016-02-08 | ES2558746     |
| <a href="#">EP2343105</a>     | B1 | 2015-12-30 | EP2343105     |
| <a href="#">US9177693</a>     | B2 | 2015-11-03 | US9177693     |
| <a href="#">IL210599</a>      | B  | 2015-07-30 | IL-210599     |
| <a href="#">EP2896433</a>     | A1 | 2015-07-22 | EP2896433     |
| <a href="#">EP2893960</a>     | A1 | 2015-07-15 | EP2893960     |
| <a href="#">US20140048292</a> | A1 | 2014-02-20 | US20140048292 |
| <a href="#">US20140048330</a> | A1 | 2014-02-20 | US20140048330 |



|               |    |            |               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|---------------|----|------------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| US8511397     | B2 | 2013-08-20 | US8511397     |   |   |   |   |
| KR101258018   | B1 | 2013-04-30 | KR101258018   |  |  |  |  |
| AU2011200058  | B2 | 2013-02-07 | AU2011200058  |  |  |  |  |
| TW201143854   | A  | 2011-12-16 | TW201143854   |  |  |  |  |
| ZA201100050   | B  | 2011-10-26 | ZA201100050   |  |  |  |  |
| EP2343105     | A3 | 2011-10-19 | EP2343105     |  |  |  |  |
| SG173267      | A1 | 2011-08-29 | SG-173267     |  |  |  |  |
| AU2011200058  | A1 | 2011-07-28 | AU2011200058  |  |  |  |  |
| CN102125741   | A  | 2011-07-20 | CN102125741   |  |  |  |  |
| KR20110083495 | A  | 2011-07-20 | KR20110083495 |  |  |  |  |
| US20110168416 | A1 | 2011-07-14 | US20110168416 |  |  |  |  |
| EP2343105     | A2 | 2011-07-13 | EP2343105     |  |  |  |  |
| CA2727200     | A1 | 2011-07-12 | CA2727200     |  |  |  |  |
| IL210599      | A  | 2011-06-30 | IL-210599     |  |  |  |  |

**IPC - International classification**

A62C; A62C-003/00; A62C-037/00; A62C-037/10; A62C-037/36; A62C-037/36; A62C-037/40; A62C-037/40; A62C-099/00; G05B-019/048; G08B-001/08; G08B-017/00; G08C-019/00; H01B-007/00; H02M

**Abstract**

(EP2343105)

A fire extinguishing system (10) includes a first data bus (22) having respectively first power (44) and command (42) leads. The system has multiple zones (14-20), each of which may include one or more detectors (26), and/or one or more suppressors (28) and activation devices (30). The first data bus is directly connected and common to the detectors, suppressors and activation devices. A controller (12) is connected to the multiple zones via the first data bus. A fire activation module (30) includes an actuation device (46). First and second power leads are connected to the actuation device. A capacitor (48) is connected to the actuation device and the power leads. The capacitor is configured to store electricity from the power leads and discharge the electricity to the actuation device during a suppression event. A wiring harness provides a zone identification element (52) in communication with a connector (50) and configured to provide a zone location assignment to the connector.

**Inventors**

FRASURE DAVID

EMBRY BRUCE

NORRIS JEFF

WYATT JOHNNY DEWAYNE

WETZORK JOHN

COOKE JAMES

**Latest standardized assignees - inventors removed**

KIDDE TECHNOLOGIES

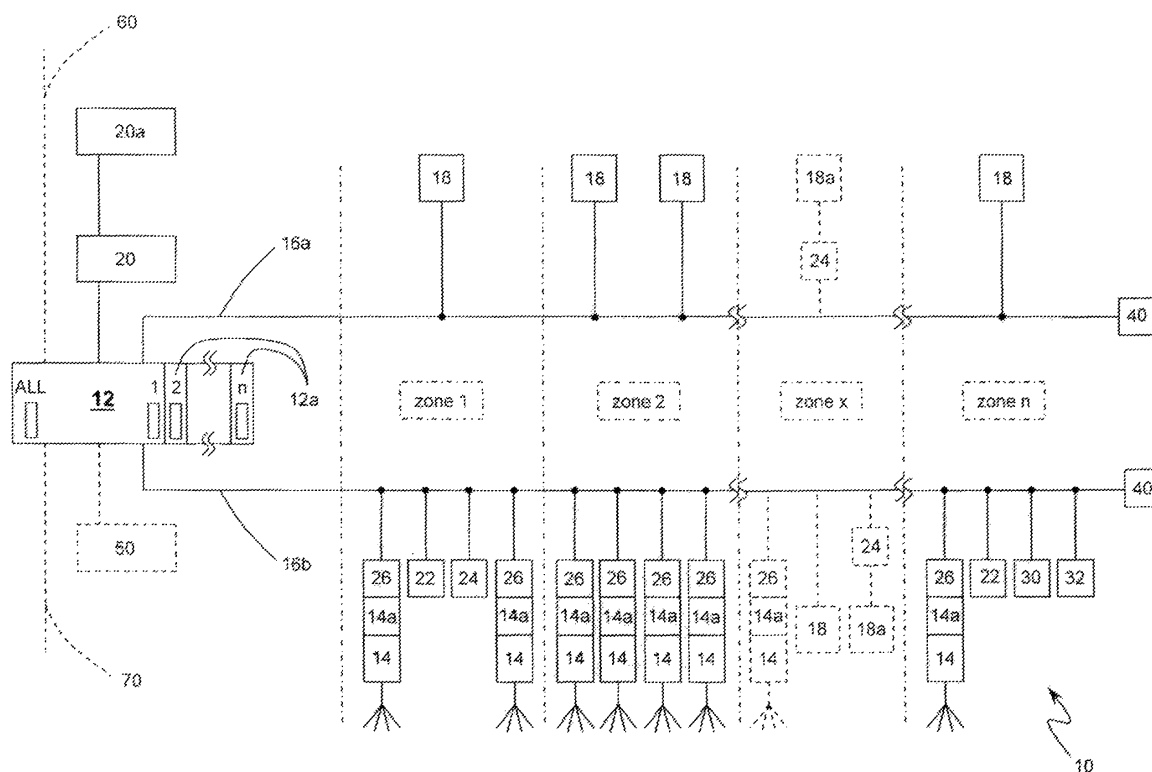
Family 17/20 - FAMPAT - ©Questel

**Title**

(EP2603291)

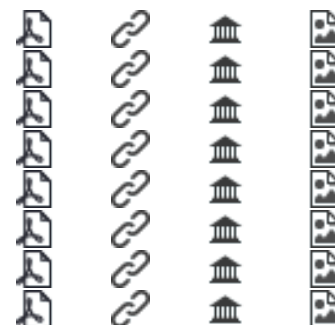
Valve for a fire extinguishing system

**Images**



#### Publication numbers with kind code & date

|                                   |    |            |               |
|-----------------------------------|----|------------|---------------|
| <a href="#">EP2603291</a>         | B1 | 2019-10-23 | EP2603291     |
| <a href="#">IL224605</a>          | B  | 2017-03-30 | IL-224605     |
| <a href="#">US9333380</a>         | B2 | 2016-05-10 | US9333380     |
| <a href="#">IN1804/CHENP/2013</a> | A  | 2014-10-03 | IN2013CN01804 |
| <a href="#">US20130255971</a>     | A1 | 2013-10-03 | US20130255971 |
| <a href="#">EP2603291</a>         | A1 | 2013-06-19 | EP2603291     |
| <a href="#">CA2807802</a>         | A1 | 2012-02-16 | CA2807802     |
| <a href="#">WO2012/021549</a>     | A1 | 2012-02-16 | WO201221549   |



#### IPC - International classification

A62C-002/00; A62C-003/07; A62C-035/02; A62C-035/68; A62C-037/36; A62C-037/42; F16K-017/16

#### Abstract

(EP2603291)

A valve for a fire extinguishing system includes a housing, a flow control apparatus, an actuator apparatus, and a manual override apparatus. The flow control apparatus is disposed in a cavity to prevent or permit flow of the fire extinguishing agent from an ingress aperture to an egress aperture of the housing. The flow control apparatus includes a burst disk clamped between the first and second annular faces and an annular spool axially movable along the longitudinal axis relative to the housing. The actuator apparatus includes a bearing sleeve angularly movable around a longitudinal axis relative to the housing and a latch element operably coupling the bearing sleeve and the annular spool. The manual override apparatus includes a cam operably coupled to the bearing sleeve.

#### Inventors

EHLERS JOSHUA L  
COUNTS BRIAN L  
BIEHL RICHARD J

#### Latest standardized assignees - inventors removed

TYCO FIRE PRODUCTS

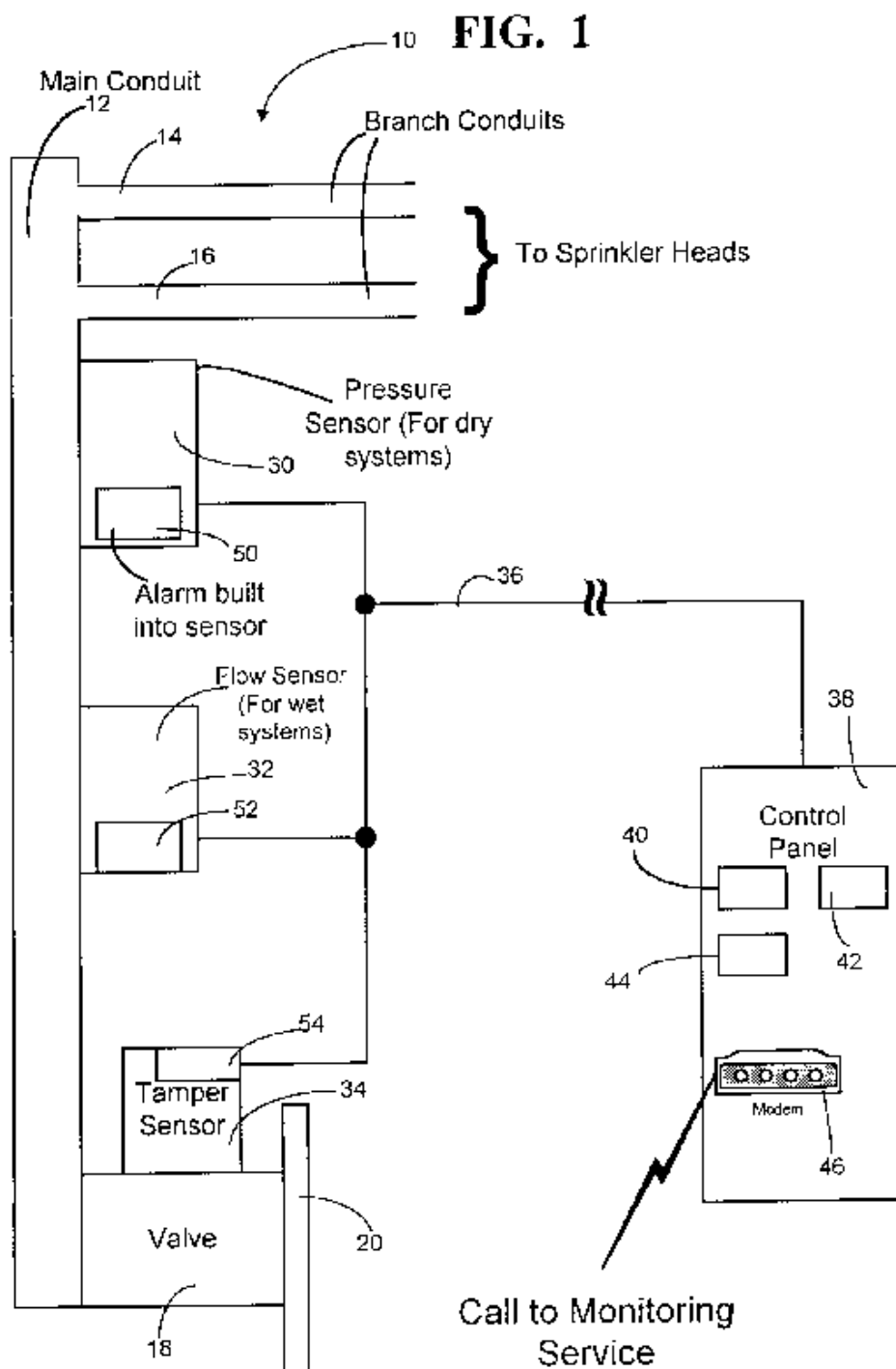
Family 18/20 - FAMPAT - ©Questel

#### Title

(US5864287)

## Alarms for monitoring operation of sensors in a fire-suppression system

## Images



## Publication numbers with kind code &amp; date

US5864287

A

1999-01-26

US5864287

CA2227802

A1

1998-07-23

CA2227802



## IPC - International classification

A62C-037/50

## Abstract

(US5864287)

Alarms for testing sensors, particularly those used in fire-suppression systems, are described. In one aspect of the invention, the alarm includes an audio and/or a visual indicator operably coupled to the housing of a sensor. The audio

indicator may be a speaker that beeps when the sensor is activated. The visual indicator may be one or more LEDs that are illuminated when the sensor is activated. The alarm also can be used to determine whether power and ground conductors extending to the sensor are properly connected. Additionally, the alarm can be used to determine whether one or more conductors extending from the sensor to the control panel are properly connected.

**Inventors**

EVANS JR RICHARD P

WHEELER STEVEN R

**Latest standardized assignees - inventors removed**

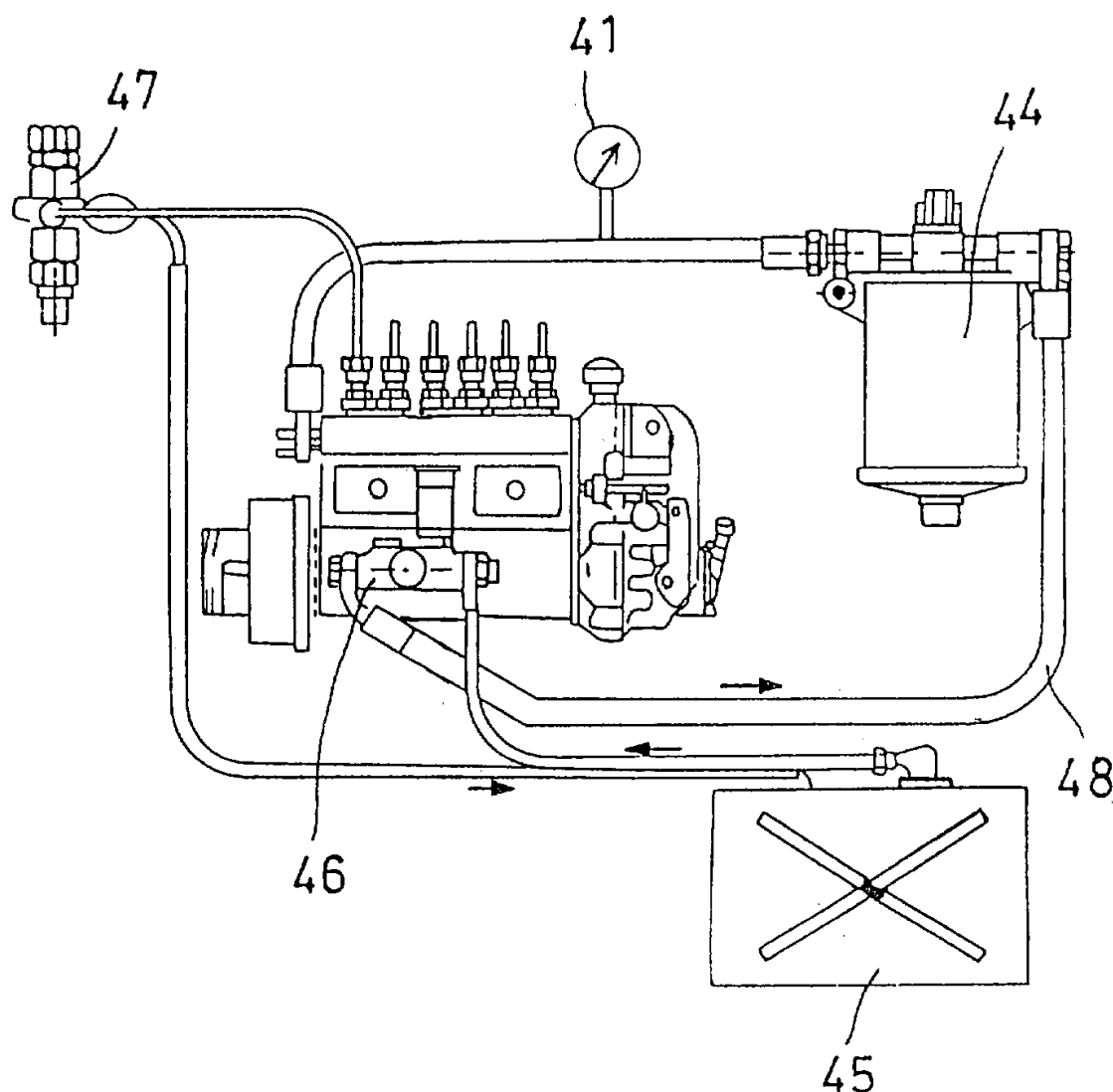
SOFTQUAD

Family 19/20 - FAMPAT - ©Questel

**Title**

(US20040084193)

Automatic anti-fire apparatus for vehicles

**Images****Publication numbers with kind code & date**[US20040084193](#)

A1 2004-05-06

US20040084193

**IPC - International classification**

A62C-003/07; A62C-037/10

**Abstract**

(US20040084193)

An anti-fire apparatus for vehicle includes a control device coupled to a fire extinguishing device for actuating the fire extinguishing device, and a detector device coupled to the control device for operating the control device to actuate the fire extinguishing device. A device may include one or more batteries for energizing the detector device. A manual switch may be used to actuate the fire extinguishing device manually. The detector device includes a detector for detecting a vehicle collision, a fuel level and/or a fuel pressure and/or an engine temperature.

### Inventors

TSENG JING SHIONG

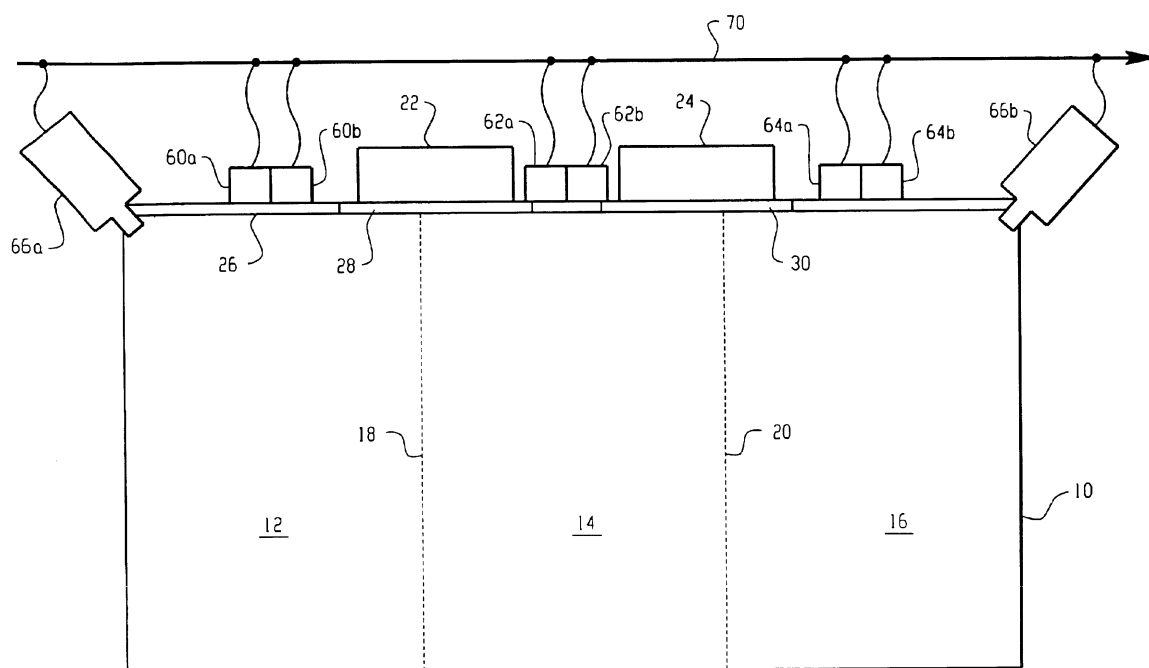
Family 20/20 - FAMPAT - ©Questel

### Title

(EP1428190)

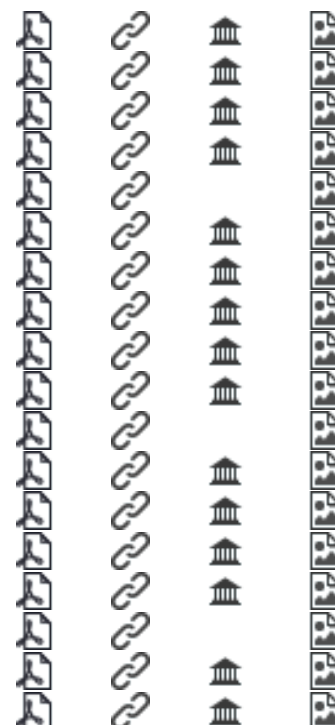
A fire detection system

### Images



### Publication numbers with kind code & date

|                              |    |            |                |
|------------------------------|----|------------|----------------|
| <a href="#">IL194547</a>     | B  | 2010-12-30 | IL-194547      |
| <a href="#">DK1616599</a>    | T3 | 2009-06-02 | DK1616599T     |
| <a href="#">IL160904</a>     | B  | 2009-05-04 | IL-160904      |
| <a href="#">DE60231258</a>   | D1 | 2009-04-02 | DE60231258     |
| <a href="#">AT422947</a>     | T  | 2009-03-15 | ATE422947      |
| <a href="#">EP1616599</a>    | B1 | 2009-02-18 | EP1616599      |
| <a href="#">US7333129</a>    | B2 | 2008-02-19 | US7333129      |
| <a href="#">DE60216295</a>   | T2 | 2007-06-21 | DE60216295     |
| <a href="#">DK1427485</a>    | T3 | 2007-02-19 | DK1427485T     |
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**Abstract**

(EP1428190)

A fire detection system for an enclosed area comprises: at least one infrared (IR) imager for generating infrared images of at least a portion of the enclosed area, for determining from the images that a fire is perceived present in the enclosed area, and for generating a first signal indicative of the perceived presence of fire; at least one fire detector for monitoring at least a portion of the enclosed area, the fire detector comprising at least one fire byproduct chemical sensor for generating at least one second signal representative of the presence of at least one fire byproduct chemical in the enclosed area; and a controller governed by the first and second signals to confirm that a fire is present in the enclosed area. In one embodiment, the enclosed area is divided into a plurality of detection zones with at least one fire detector disposed at each detection zone. In this embodiment, the controller includes a first controller governed by the second signals for generating a third signal indicative of the presence of fire in the corresponding detection zone; and a second controller governed by the first and third signals to confirm that a fire is present in at least one detection zone of the enclosed area.

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**Latest standardized assignees - inventors removed**

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