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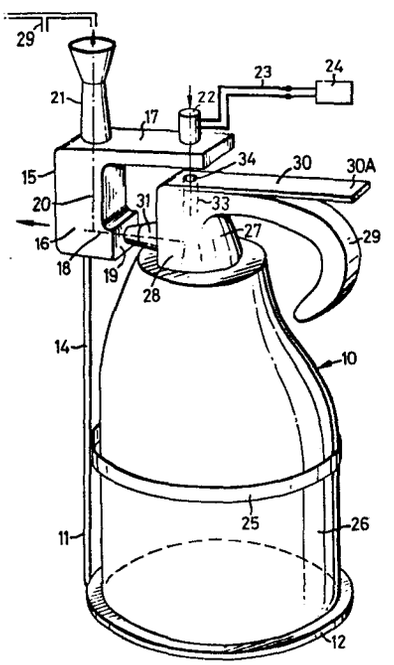
(54) Improvements in or relating to fire fighting equipment.

(57) A fire fighting system includes one or more fire extinguishers (10) which are associated with a protected area. The extinguisher (10) is mounted on a bracket (11) which includes a coupling member (15) for coupling the extinguisher to the conduit for carrying fire extinguishing fluid to an outlet (29). The extinguisher (10) can be activated automatically from a remote location by means of an actuating device (22) such as a Metron protractor. The extinguisher (10) can also be activated manually by means of a lever (30).



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DESCRIPTION

This invention relates to fire fighting equipment.

One form of fire fighting equipment comprises a portable, manually operable fire extinguisher. Such extinguishers generally comprise a cylinder containing a fire extinguishing fluid and a closure cap with an outlet nozzle. One or more extinguishers are provided at strategic locations in a protected area. The extinguishers are usually supported on a mounting bracket which is attached to a wall. In the event of a fire the extinguisher is removed from its bracket and activated manually by means of a knob or lever on the cap. Operation of the knob or lever can either open a valve to allow the fire extinguishing fluid to issue through the outlet nozzle, or rupture a frangible container within the cylinder, the frangible container containing a substance which reacts with fluid in the cylinder to cause fire extinguishing fluid to issue through the outlet nozzle.

Another form of fire fighting equipment is a fixed system in which one or more fire extinguishers are permanently connected to a conduit which has one or more nozzles directed at the protected area. Each extinguisher has an activating mechanism which is triggered from a remote location. The triggering arrangement can be electrical and actuated by

electrical signals which can be generated by a heat sensor or smoke detector in the protected area or transmitted from some central control point. Such a system can operate automatically in response to the electrical signals. In this type of system the extinguishers are permanently connected to the conduits and cannot be removed for portable manual operation.

In the present invention I provide fire fighting equipment which includes an extinguisher which can be connected in a fixed system for automatic operation or can be used in a portable manual mode.

According to one aspect of the present invention there is provided a fire fighting system which includes one or more fire extinguishers, means for mounting said extinguishers so that they can be coupled to a conduit for carrying fire extinguishing fluid, said conduit including one or more outlets directed at a protected area, means for automatically activating the or each extinguisher and the or each extinguisher including manually operable means for activating the extinguisher and being so mounted that it can be removed for manual operation.

The or each extinguisher may comprise a cylinder for containing fire extinguishing fluid, a closure cap for said cylinder, said closure cap having an outlet nozzle, a movable actuating member for activating said extinguisher and manually operable means for causing movement

of said actuating member, said actuating member and said manually operable means being so arranged and disposed that the actuating member can be moved in response to an impulse received from said automatic activating means.

The mounting means may comprise a bracket which is attachable to a wall or similar structure, said bracket carrying a coupling member having a bore one end of which is arranged to sealingly receive the outlet nozzle of said extinguisher and the other end of which is coupled to said conduit, said coupling member being arranged to carry said means for automatically activating said extinguisher.

The means for automatically activating said extinguisher may comprise an electrically triggerable firing device such as a Metron protractor. The firing device can be triggered in response to electrical signals received from for example a heat sensor or a smoke detector located in or in the vicinity of the protected area or from a central control point. The means for automatically activating the extinguisher may be arranged to act directly on the movable member. Alternatively the means for automatically activating the extinguisher may be arranged to act on the movable member through an intermediate mechanism.

According to another aspect of the present invention there is provided a fire extinguisher for use in the system according to said one aspect,

the extinguisher comprising a cylinder for containing fire extinguishing fluid, a closure cap for said cylinder, said closure cap having an outlet nozzle, a movable actuating means for activating said extinguisher, and manually operable means for causing movement of said actuating means, said actuating means and said manually operable means being so arranged and disposed that the actuating means can receive an impulse from an automatic activating means to cause movement thereof.

Said manually operable means may comprise a lever pivotally mounted on said cap and said actuating means may include a pin which is movable axially in response to pivoting movement of the lever, said lever having formed therein an aperture which exposes an end face of said pin and allows it to receive said impulse.

The closure cap may include a valve which is operable in response to movement of said actuating member.

According to a further aspect of the present invention there is provided mounting means for mounting a fire extinguisher in a system according to said one aspect, said mounting means comprising a coupling member having a bore one end of which is arranged to sealingly receive the outlet nozzle of a fire extinguisher and the other end of which can be coupled to a conduit, said coupling member being arranged to carry said means for automatically activating said extinguisher.

The coupling member may be carried by a bracket which can be attached to a wall or similar structure. The bracket may include a releasable strap which can embrace the cylinder of an extinguisher to retain it in position.

A feature of the present arrangement is that the or each extinguisher can be mounted in a fixed fire fighting system for automatic operation but can if the need arises be removed for manual portable operation.

The invention will be described now by way of example only with particular reference to the accompanying drawings. In the drawings:

Figure 1 is a schematic perspective view of fire fighting equipment in accordance with the present invention;

Figure 2 is an end view partly in section of an actuator and extinguisher cap assembly which can be used in the system of Figure 1, and

Figure 3 is a side view partly in section of the assembly of Figure 2.

The fire fighting equipment shown in Figure 1 of the drawings comprises a fire extinguisher 10 which can be supported on a wall or similar structure in a protected area by means of a supporting bracket 11 which is attachable to the wall. The supporting bracket 11 comprises a base portion 12 for supporting the extinguisher 10, a side

limb 14 extending upwardly from the base portion 12 to a generally L-shaped coupling member 15. The coupling member 15 is arranged to provide a connection between the extinguisher 10 and a conduit of a fixed fire fighting system. The coupling member 15 has a generally upwardly extending limb 16 which is formed integrally with a generally horizontally extending limb 17. The upwardly extending limb 16 has a bore with a laterally extending portion 18 which opens towards the lower part of the limb face 19 and an upwardly extending portion 20 which communicates with a connecting member 21 which can provide a connection to the conduit of a fire fighting system. The coupling member 15 can be arranged so that its position on the side limb 14 is adjustable axially along the limb.

The horizontal limb 17 has towards its outer end an aperture which is designed to receive an electrically triggerable, actuating device 22 known as a Metron protractor. The Metron protractor 22 can be actuated from an external location by means of electrical signals transmitted along leads 23 from a heat sensor or control station shown schematically at 24.

The extinguisher 10 comprises a cylinder 26 which contains fire extinguishing fluid such as halon gas. The cylinder 26 is closed by a cap portion indicated generally at 27. The extinguisher is retained on the mounting device 11 by means of a releasable strap 25 which can embrace the outer periphery of the cylinder 26.

The cap 27 comprises a valve body portion 28 which sits on the upper end face of the cylinder 26 and is formed integrally with a hook shaped handle 29. A lever 30 is pivotally mounted above the handle 29 and can be pivoted by downward pressure on its end 30A. The valve body portion 28 has an outlet nozzle 31 which when the cylinder 26 is mounted on the supporting member 11 is arranged to enter the bore portion 18 in the coupling member 15. The outlet nozzle 31 is sealed in this bore portion by means of an O-ring seal carried on the outer circumference of the outlet nozzle 31. Normally the outlet nozzle is isolated from the interior of the cylinder 26 by means of a valve within the valve body portion 28. The valve has an actuating pin shown schematically at 33. The pin extends upwardly so that the upper end surface of the pin terminates just below the lever 30 and is aligned with an aperture 34 formed in the lever 30 to thereby expose the upper end face. The valve of the extinguisher can be opened either by manually exerting downward pressure on the lever 30 to move the pin 33 axially downwardly or by applying an impulse to the exposed end face of the actuating pin of the valve by means of the Metron protractor 22. The Metron protractor is an explosive type device with a rod which is moved axially by a small explosion when the device is triggered electrically. In the arrangement shown in Figure 1 the Metron protractor is arranged such that, when

it is actuated its rod moves axially downwardly to strike the actuating pin of the valve thereby opening the valve.

In operation the extinguisher 10 is normally mounted upon the mounting bracket 11 so that the outlet nozzle 31 is sealed within the bore portion 18. The leads 23 are connected to equipment such as a heat sensor, a smoke detector or to a central control panel 24 which can produce electrical signals for triggering the Metron protractor 22. The extinguisher can be activated by applying energising signals along leads 23 to the Metron protractor so that the rod thereof applies a downward impulse to the actuating pin of the valve to cause the valve to open. Opening the valve will allow extinguishing fluid to issue from the cylinder and to enter the bore portions 18 and 20 so that it can flow via the connector 21 to the conduit of the fixed fire fighting system which has an outlet nozzle or nozzles 29 at strategic locations in the space protected by the system.

If it is required to use the extinguisher 10 in a portable manner the strap 25 is released and the extinguisher removed from its mounting bracket 11. The extinguishing fluid can then be released from the cylinder 26 simply by depressing the lever 30.

Thus it will be seen that the extinguisher of the present arrangement can be used either as part of a fixed fire fighting system in which the extinguisher is activated automatically from some point remote from the extinguisher or as a portable, manually operable extinguisher.

The coupling member 15 can be adjusted axially of the limb 14 to accommodate extinguishers of different sizes.

Referring now to Figures 2 and 3 there is shown a modified form of coupling assembly for attachment to the cylinder 26. In these Figures components corresponding to those of Figure 1 are shown by corresponding reference numerals. Thus the assembly has an L-shaped coupling member 15 corresponding to the coupling member shown in Figure 1. The upwardly extending bore portion is shown at 20 and the laterally extending portion at 18. The laterally extending portion 18 has a bore which receives the outlet nozzle of the fire extinguisher. In this case the outlet nozzle is constituted by a tubular portion 40 which screws into a cylindrical recess 41 formed in the cap 27. The tubular portion 40 carries an O-ring seal 42 which seals the nozzle 40 within the bore of the laterally extending portion 18.

The horizontally extending limb 17 has towards its free end an aperture 48 which receives the lower end of a block 50. The lower end of the block 50 protrudes through the aperture 48 in the limb 17, the lower end having a circumferential groove which receives a retaining clip 52. When the clip 52 is in position in the groove it restrains the block from upward movement relative to the limb 17.

The block 50 has machined therein an annular groove 53 thereby defining two oppositely located arcuate portions 54, 55. The groove 53 receives the limb 17 so that the

portions 54, 55 locate against outer side faces of the limb 17. This arrangement prevents rotation of the block 50 relative to the limb 17. The block has a generally upwardly extending through bore 58 within which is located a pin 59. The pin 59 is normally biassed upwardly by a spring 60 which extends between the head 61 of the pin and a shoulder 62 in the bore 58. A ball 64 is located above the head 61. The ball is biassed into engagement with the lower straight surface of a semicircular cam member 68 which is pivotally mounted on a pivot pin 70. The cam member 68 can rotate anti-clockwise through approximately 70° from the position shown in Figure 2 a slot being formed in the upper part of the block to receive the cam. The block also carries a lever 71 the lower end of which is bifurcated at 72 and pivotally mounted on the pin 70. The cam member 68 carries a transversely extending pin 74 which protrudes laterally beyond the bifurcated limbs of the lever 71.

The block 50 has a lateral extension 76 which carries the Metron protractor 22. The Metron protractor is screwed into a threaded bore in the block as shown in Figure 2 and is arranged such that its actuating rod can strike the lower flat face of the cam member 68.

Also shown in Figures 2 and 3 are the manually operable pivotable lever 30, rod 14 of the mounting bracket 11 which is attached to the coupling member 15 by grub screws 78 and the handle 29 corresponding to the elements described with reference to Figure 1. The cap 27 for the cylinder includes a valve assembly 80

which includes a valve member 81 which is movable in response to downward movement of the actuating pin 33. When the valve member 81 is moved to the open position fire extinguishing fluid can flow to the outlet nozzle 40. The assembly shown in Figures 2 and 3 can be screwed onto the upper end of a fire extinguishing cylinder. The cap 27 includes a pressure gauge 85 and a burst disc assembly 86 which is provided as a safety measure in the event that pressure within the cylinder exceeds a predetermined value.

In operation the cylinder can be operated either manually, or automatically from a remote location generally as described with reference to Figure 1. When the cylinder is operated automatically electrical signals fed to the Metron protractor 22 result in the operating rod of that protractor moving upwardly to strike the lower flat surface of the cam member 68. This causes the cam member 68 to rotate in an anti-clockwise direction as shown in Figure 2. When the cam rotates in this direction the ball 64 is forced downwardly which results in downward movement of the pin 59. When the pin 59 moves downwardly it strikes the actuating pin 33 of the valve causing it to move downwardly also. The valve 81 in the cap of the cylinder thus opens and releases fire extinguishing fluid through the valve and into the conduit 20. The cam is rotated to a position in which its curved surface engages the ball 64. In this position the upward force applied to the cam 68 will not return it to its original position and thus the valve is retained in its open position.

Alternatively, the cylinder can be activated by pivoting the lever 71 in an anti-clockwise direction as shown in Figure 2. When the lever 71 is so pivoted it engages the pin 74 and causes the cam 68 to rotate in the manner just described. Thus the valve 81 in the cylinder is opened in a manner similar to that just described and fire extinguishing fluid is released. The lever 71 can be pivoted by direct manual operation or remotely by way of a wire or string attached to the free end of the lever by way of aperture 90.

The cylinder can also be removed from its mounting bracket as already described for manual operation by means of the pivotable lever 30.

As described the cylinder is activated remotely by an electrically operable device 22. It will be appreciated that other types of device, e.g. pneumatically operated, can also be used.

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CLAIMS

1. A fire fighting system characterised by including one or more fire extinguishers (10), means (11, 15) for mounting said extinguishers so that they can be coupled to a conduit for carrying fire extinguishing fluid, said conduit including one or more outlets (29) directed at a protected area, means (22) for automatically activating the or each extinguisher, and the or each extinguisher including manually operable means (30) for activating the extinguisher and being so mounted that it can be removed for manual operation.

2. A fire fighting system as claimed in claim 1 characterised in that each extinguisher (10) comprises a cylinder (26) for containing fire extinguishing fluid, a closure cap (27) for said cylinder, said closure cap having an outlet nozzle (31), a movable member (33) for activating said extinguisher and manually operable means (30) for causing movement of said actuating member, said actuating member and said manually operable means being so arranged and disposed that the actuating member can be moved in response to an impulse received from said automatic activating means (22).

3. A fire fighting system as claimed in claim 2 characterised in that the mounting means comprise a bracket (11) attachable to a wall or similar structure, said bracket carrying a coupling member (15) having a bore (20) one end of which is arranged to sealingly receive the outlet nozzle (31) of said extinguisher and the other end which is coupled to

said conduit, said coupling member (15) being arranged to carry said means (22) for automatically activating said extinguisher.

4. A fire fighting system as claimed in any preceding claim characteristed in that said means (22) for automatically activating said extinguisher comprises an electrically triggerable firing device such as a Metron protractor.

5. A fire fighting system as claimed in claim 4 characterised in that the firing device (22) is arranged to be triggered in response to electrical signals received from a sensing means (24) in or in the vicinity of the protected area, or from a central control.

6. A fire fighting system as claimed in any one of claims 2 to 5 characterised in that the means (22) for automatically activating said extinguisher is arranged to act directly on said movable member (33).

7. A fire fighting system as claimed in any one of claims 2 to 5 characterised in that the means (22) for automatically activating said extinguisher is arranged to act on said movable member (33) through an intermediate mechanism (68, 64, 59).

8. A fire extinguisher for use in the system claimed in any one of claims 1 to 7 characterised by comprising a cylinder (26) for containing fire extinguishing fluid, a closure cap (27) for said cylinder, said closure cap having an outlet nozzle (31),

a movable actuating means (33) for activating said extinguisher, and manually operable means (30) causing movement of the actuating means, said actuating means (33) and said manually operable means (30) being so arranged and disposed that the actuating means (33) can receive an impulse from an automatic activating means (22) to cause movement thereof.

9. A fire extinguisher as claimed in claim 8 characterised in that said manually operable means (30) comprises a lever pivotally mounted on said cap and said actuating means (33) includes a pin which is movable axially in response to pivoting movement of the lever, said lever (30) having formed therein an aperture (34) which exposes an end face of the pin and allows it to receive said impulse.

10. A fire extinguisher as claimed in claim 8 or claim 9 characterised in that said closure cap (27) includes a valve (80) which is operable in response to movement of the actuating means (33) to allow fire extinguishing fluid to flow to said outlet nozzle (31).

11. Mounting means for mounting a fire extinguisher in a system as claimed in any one of claims 1 to 7, characterised in that said mounting means includes a coupling member (15) having a bore (20) one end of which is arranged to sealingly receive the outlet nozzle (31) of a fire extinguisher and the other end of which can be coupled to a conduit, said coupling member (15) being arranged to carry said means (22) for automatically activating said extinguisher.

12. Mounting means as claimed in claim 11 characterised in that said coupling member (15) is carried by a bracket (11) which can be attached to a wall or similar structure.

13. Mounting means as claimed in claim 12 characterised in that the bracket (11) includes a releasable strap (25) which can embrace the cylinder (26) of an extinguisher to retain it in position.

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FIG.1

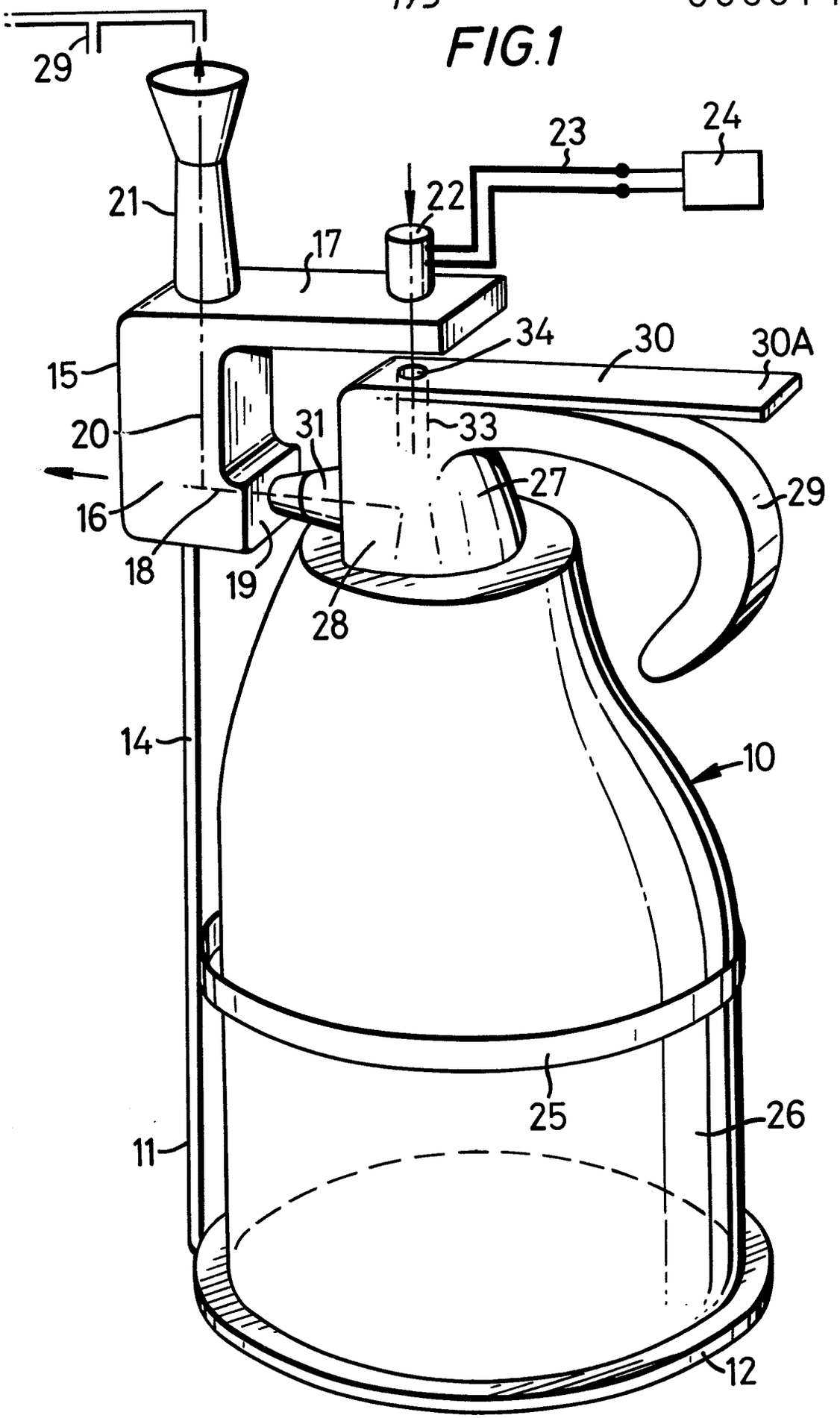

FIG.2

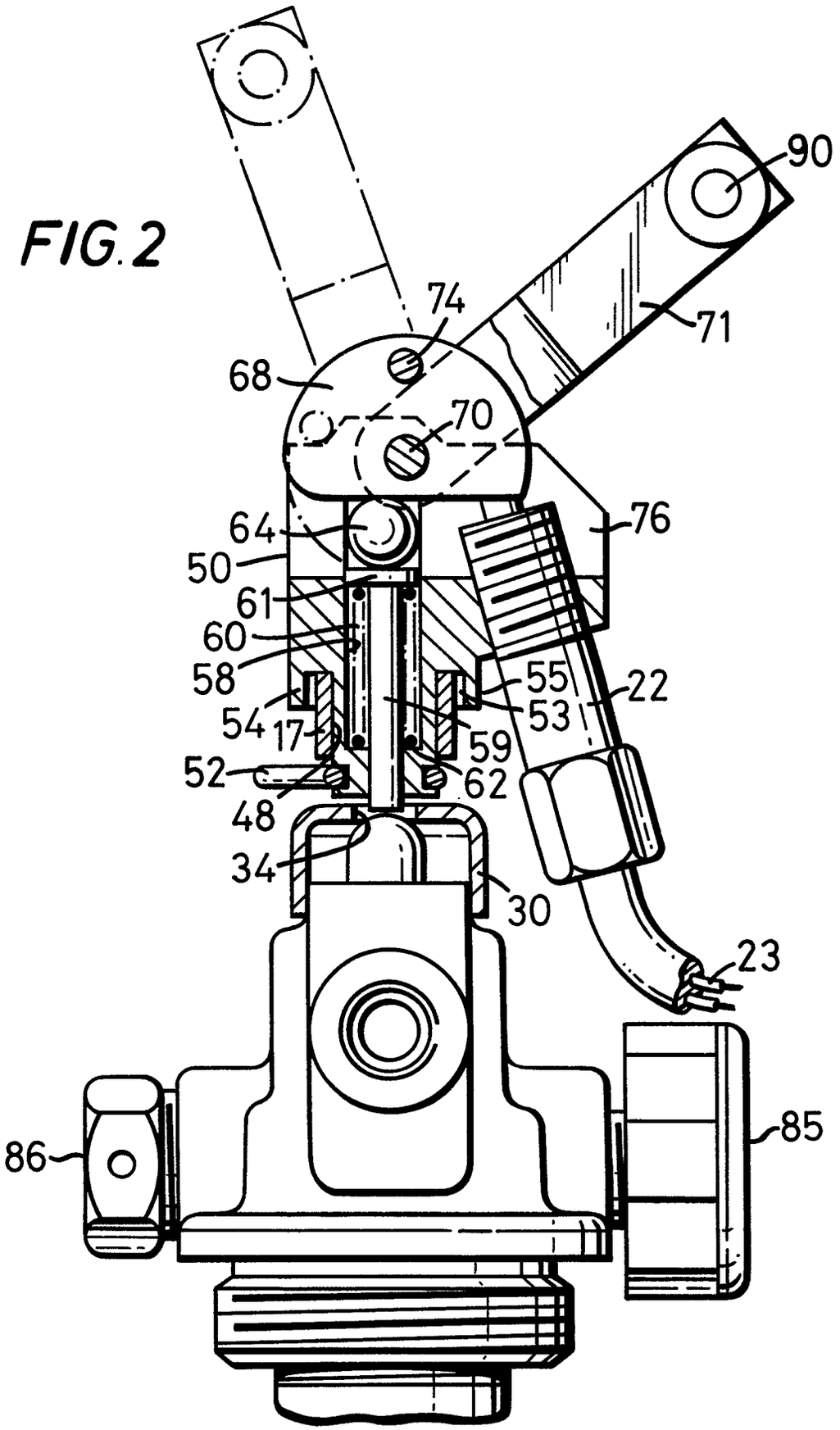
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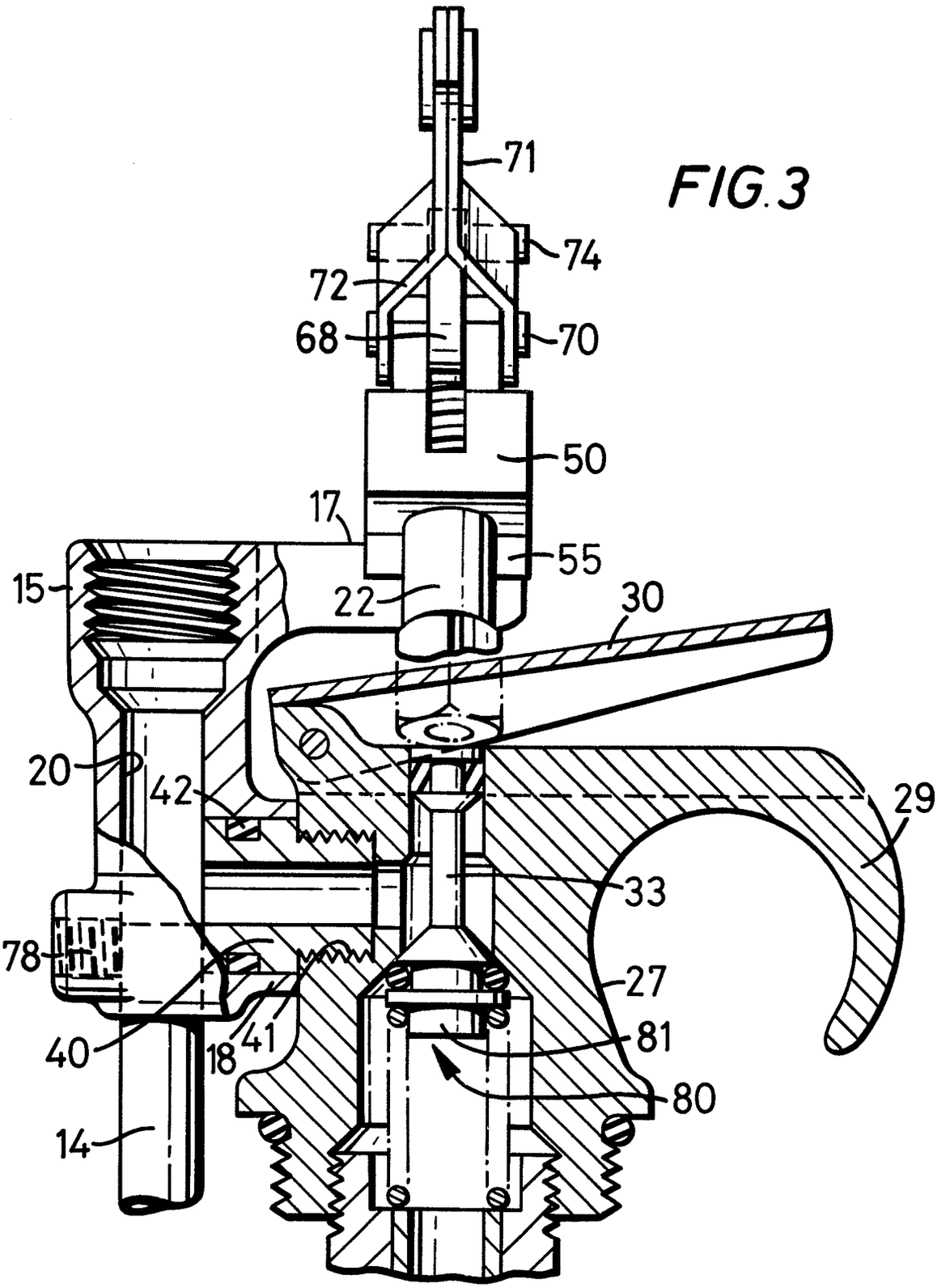
FIG.3



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EUROPEAN SEARCH REPORT

0068743
Application number

EP 82 30 3166

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Y	US-A-2 563 852 (SPECIALTIES DEVELOPMENT CORPORATION) * Figure 1; column 2, lines 27-42; column 1, lines 14-16 *	1,2,6, 7	A 62 C 35/02 A 62 C 37/06
Y	GB-A-1 556 217 (FIRESNOW LTD.) * Figures 1,2; page 1, line 14 - page 2, line 70 *	1,2,6, 7	
Y	US-A-4 020 904 (J.S. DEPALMA) * Column 1, lines 55-64; column 3, line 61 - column 4, line 6 *	1,2,6, 8	
A	AU-B- 471 307 (GRAVINER (COLNBROOK) LIMITED) * Page 2 *	4,5	
A	GB-A-2 039 735 (D.G. JONES, A.W. BARNES)		TECHNICAL FIELDS SEARCHED (Int. Cl. ³) A 62 C
A	FR-A- 764 299 (BREVO S.A.)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17-09-1982	MUTTOCK N.J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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