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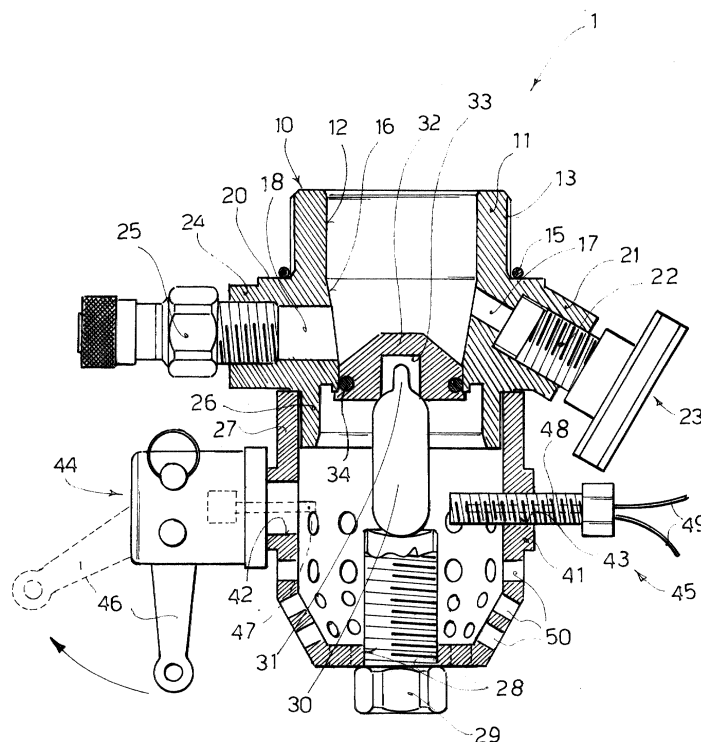
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(54) Discharge valve for discharge of extinguishing fluid

(57) A discharge valve (1) for discharge of extinguishing fluid comprises a valve body (10) for the passage of extinguishing fluid and a discharge nozzle (27) that provides a plurality of holes (50) for discharge of the extinguishing fluid, breakable means (30) disposed inside said nozzle (27) or inside said valve body (10)

supporting closure means (32) to prevent the extinguishing fluid from passing from the valve body to the discharge nozzle and actuator means (44, 45) to cause breakage of said breakable means so that said closure means (32) fall into the nozzle causing the extinguishing fluid to pass from the valve body to the discharge nozzle.

FIG. 2



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Description

[0001] The present invention refers to a discharge valve for the discharge of extinguishing fluid.

[0002] According to current fire-fighting regulations, environments at risk of fire must be equipped with appropriate fire-fighting systems.

[0003] Fire-fighting systems according to the prior art consist of one or more extruded cylinders connected to an extinguishing fluid distribution line which terminates in discharge nozzles for saturation of the environment to be protected.

[0004] Activation of said systems takes place by means of a dedicated detector system consisting of a control station comprising optical smoke, flame and/or heat detectors. When the optical detectors detect a risk signal indicating an outbreak of fire, the control station activates discharge of the extinguishing fluid contained in the cylinder. The extinguishing fluid thus reaches the discharge nozzles through the distribution line and is released, saturating the protected environment.

[0005] It is obvious that such a known fire-fighting system is somewhat complex and costly, precisely because of the presence of the dedicated control station and the distribution line controlled by the control station.

[0006] The object of the present invention is to eliminate the drawbacks of the prior art by providing a discharge valve for discharge of extinguishing fluid that is economical and simple to make.

[0007] Another object of the present invention is to provide such a discharge valve for the discharge of extinguishing fluid that is versatile and safe.

[0008] These objects are achieved in accordance with the invention with the characteristics listed in the appended independent claim 1.

[0009] Advantageous embodiments of the invention are apparent from the dependent claims.

[0010] The discharge valve for extinguishing fluid according to the invention provides a bulb inside the discharge nozzle which supports a closure plate to prevent the outflow of extinguishing fluid into the discharge nozzle.

[0011] The bulb is sensitive to temperature. When the temperature detected by the bulb reaches a certain threshold (68°C), the bulb is caused to break and consequently the closure plate falls inside the discharge nozzle causing the passage of extinguishing fluid into the discharge nozzle and thus the discharge of extinguishing fluid through the holes of the discharge nozzle.

[0012] The discharge valve for extinguishing fluid according to the invention does not have any fire detection system or distribution line to carry the extinguishing fluid to a discharge nozzle. Consequently it is extremely simple and economical.

[0013] Further characteristics of the invention will be made clearer by the detailed description that follows, referring to an exemplary and therefore non-limiting embodiment thereof, illustrated in the appended drawings,

in which:

Figure 1 is a part-sectional front view of a discharge valve according to the invention installed on a tank;

Figure 2 is an axial sectional view of the discharge valve of Figure 1, showing the adjustment system according to the invention;

Figure 3 is a front view of a preferred embodiment of the discharge nozzle of the valve of Figure 2;

Figure 4 is a cross-sectional view of the discharge nozzle taken along sectional plane IV-IV of Figure 3.

[0014] A discharge valve for extinguishing fluid according to the invention, designated as a whole with reference numeral 1, is described with the aid of the figures.

[0015] As shown in Figure 1, the valve 1 can be installed on a tank 2. The tank 2 contains extinguishing fluid, for example fluid of the liquid halogen type. By way of example, the tank 2 has a capacity of about 14 litres and has brackets 3, disposed in the upper wall thereof, for fixing to a roof or to the upper part of a supporting frame. The valve 1 is disposed in the lower wall of the tank 2 for delivery of the extinguishing fluid into the environment beneath.

[0016] The valve 1 can obviously be installed on tanks with different shapes and capacities, such as, for example, tanks in the form of cylinders with a capacity of six litres and large tanks with a capacity of 25 litres.

[0017] As shown better in Figure 2, the valve 1 comprises a body 10 in nickel-plated brass. The body 10 has a substantially cylindrical mouth 11 terminating in an annular abutment surface 20 which extends radially. The mouth 11 has an outer thread 13 to engage with an inner thread of an outlet duct 14 (Figure 1) provided in the lower part of the tank 2. A gasket 15 of the OR type is disposed between the outlet duct 14 of the tank and the mouth 13 of the valve and lies in the angle between the mouth 11 and the abutment surface 20.

[0018] A connector 21 with a hollow cylindrical shape having an inner thread to engage with the sensitive part 22 of a pressure gauge 23 protrudes obliquely downward from the abutment surface 20.

[0019] A second connector 24 with a hollow cylindrical shape having an inner thread to receive a charging valve 25 protrudes radially from the abutment surface 20 in a diametrically opposite direction to the connector 21.

[0020] In its bottom part the body 10 has a hollow cylindrical connector 26 coaxial to the mouth 11. The connector 26 has an outer thread for engagement with the inner thread of a discharge nozzle 27.

[0021] The mouth 13 defines an inlet duct 12 that continues with a tapered narrowing duct 16 which communicates with an oblique duct 17 inside the connector for pressure gauge 23 and a radial duct 18 inside the con-

necter 24 for charging valve 25.

[0022] In this manner the sensitive part 22 of the pressure gauge 23, being situated inside the duct 17, can measure the pressure of the fluid inside the tank 2. In fact the fluid inside the tank 2 reaches the sensitive part 22 of the pressure gauge through the ducts 14, 12, 16 and 17.

[0023] The charging valve 25 can be connected to an extinguishing fluid distributor. Thus the extinguishing fluid from the distributor enters the tank 2 through the ducts 18, 16, 12 and 14.

[0024] As better shown in Figures 3 and 4, the discharge nozzle 27 comprises a substantially cylindrical body, hollow on the inside, open in its upper surface to receive the connector 26 of the valve body 10.

[0025] In the lower wall, the nozzle 27 has a threaded central hole 28 to receive the shank of a bolt 29. When the bolt 29 is tightened, the upper end of the shank reaches a central area inside the nozzle 27. A bulb 30 is disposed in the upper part of the shank of the bolt 29. The bulb 30 is a heat sensor that is activated and breaks when the temperature reaches about 68°C. The bulb 30 has a point 31 with a smaller diameter than the body.

[0026] A closing plate 30 is positioned above the bulb 30. The plate 32 has a cavity 33 which is positioned above the point 31 of the bulb. A gasket 34 of the OR type is interposed between the side wall of the plate 32 and the inner side wall of the body 10 of the valve. In this manner the extinguishing fluid provided within the ducts 12, 16 of the valve body 10 cannot enter into the nozzle 27.

[0027] The nozzle 27 has two hubs 40, 41 in the side wall, disposed in diametrically opposite positions. The hubs 40, 41 define two apertures 42, 43 to receive a manual actuator 44 and an electrical "protractor" actuator 45, respectively.

[0028] The manual actuator 44 has a lever 46 which protrudes outward from the valve 1 so as to be able to be operated manually by a user. The lever 46 pushes a small piston 47 disposed inside the aperture 42, radially with respect to the axis of the nozzle 27. When the lever 46 is operated the small piston 47 passes from a retracted position to an extracted position and strikes against the bulb 30 disposed axially in a central position in the nozzle 27, causing breakage thereof. In this manner the stop plate 32 supported by the bulb 30 falls inside the nozzle 27, allowing the extinguishing fluid to pass inside the body of the nozzle.

[0029] The protractor actuator 45, on the other hand, contains an explosive capsule 48 inserted in the aperture 43. Explosion of the capsule 48 causes the bulb 30 to break and the stop plate 32 to fall inside the nozzle with the consequent discharge of the extinguishing fluid. Operation of the protractor 45 takes place by means of electrical cables 49 which receive a control signal given by the user by means of the push button of a switch or through a remote control. Operation of the protractor can of course be automatic and controlled from control

station when certain threshold values are exceeded.

[0030] In any case the valve intervenes through breakage of the bulb when the temperature reaches about 68°C, as stated previously.

[0031] With reference to Figures 3 and 4, the nozzle 27 has thirty-four radial holes 50 for discharge of the extinguishing fluid, arranged in four rows A, B, C and D, disposed circumferentially on the side surface. Row A has 12 equidistant holes at an angle of 30°. Row B has 10 equidistant holes at an angle of 30° leaving out the two hubs 40 and 41. Row C has 6 equidistant holes at an angle of 30° leaving out the two hubs 40 and 41. Row D has 6 equidistant holes at an angle of 30° leaving out the two hubs 40 and 41.

[0032] The nozzle 27 may be of the closed type and discharge will take place through one of the two apertures 40, 41, intended respectively for the manual actuator 44 and the protractor 45.

[0033] Numerous modifications and variations of detail within the reach of a person skilled in the art can be made to the present invention, without thereby departing from the scope of the invention set forth in the appended claims.

Claims

1. A discharge valve (1) comprising a valve body (10) for the passage of extinguishing fluid and a discharge nozzle (27) which provides at least one hole (40, 41, 50) for discharge of the extinguishing fluid, **characterized in that** it comprises
 - breakable means (30) disposed inside said nozzle (27) or inside said valve body (10) supporting closure means (32) to prevent the passage of extinguishing fluid from the valve body to the discharge nozzle and
 - actuator means (44, 45) to cause breakage of said breakable means so that said closure means (32) fall inside the nozzle causing the extinguishing fluid to pass from the valve body to the discharge nozzle.
2. A valve (1) according to claim 1, **characterized in that** said breakable means (30) are sensitive to temperature and break when they detect a temperature above a certain threshold.
3. A valve (1) according to claim 1 or 2, **characterized in that** said actuator means comprise a manual actuator (44) that can be operated manually by the user to cause breakage of said breakable means.
4. A valve (1) according to claim 3, **characterized in that** said manual actuator has a control lever (46) that operates a small piston (47) to bring it into abutment against said breakable means (30) to cause

breakage thereof.

5. A valve (1) according to any one of the preceding claims, **characterized in that** said actuator means (45) comprise a protractor comprising an explosive capsule (48) that can be operated by the user by means of an electronic switch or a remote control. 5
6. A valve (1) according to claim 5, **characterized in that** said explosive capsule (48) can be operated by means of a switch, a remote control, or automatically when certain threshold values are exceeded. 10
7. A valve (1) according to any one of the preceding claims, **characterized in that** said breakable means (30) are a bulb (30) disposed axially inside the body of the nozzle (27). 15
8. A valve (1) according to claim 7, **characterized in that** said bulb (30) is supported by the shank of a bolt (29) which engages in the lower wall of the nozzle (27). 20
9. A valve (1) according to any one of the preceding claims, **characterized in that** a pressure gauge (23) is fitted to the body of said valve to check the pressure in the inner ducts of the valve communicating with the chamber of a tank (2) containing the extinguishing fluid on which said valve (1) is installed. 25 30
10. A valve (1) according to any one of the preceding claims, **characterized in that** a charging valve (25) communicating with inner ducts of the valve body (10), in turn communicating with the chamber of a tank (2) containing the extinguishing fluid, is applied to the body of said valve (1). 35
11. A valve according to any one of the preceding claims, in which said holes (40, 41) for discharge of the extinguishing fluid house said normal actuator (44) and said protractor (45), respectively. 40
12. A valve according to any one of the preceding claims, wherein said holes (50) for discharge of the extinguishing fluid are disposed in rows in the body of the nozzle (27). 45

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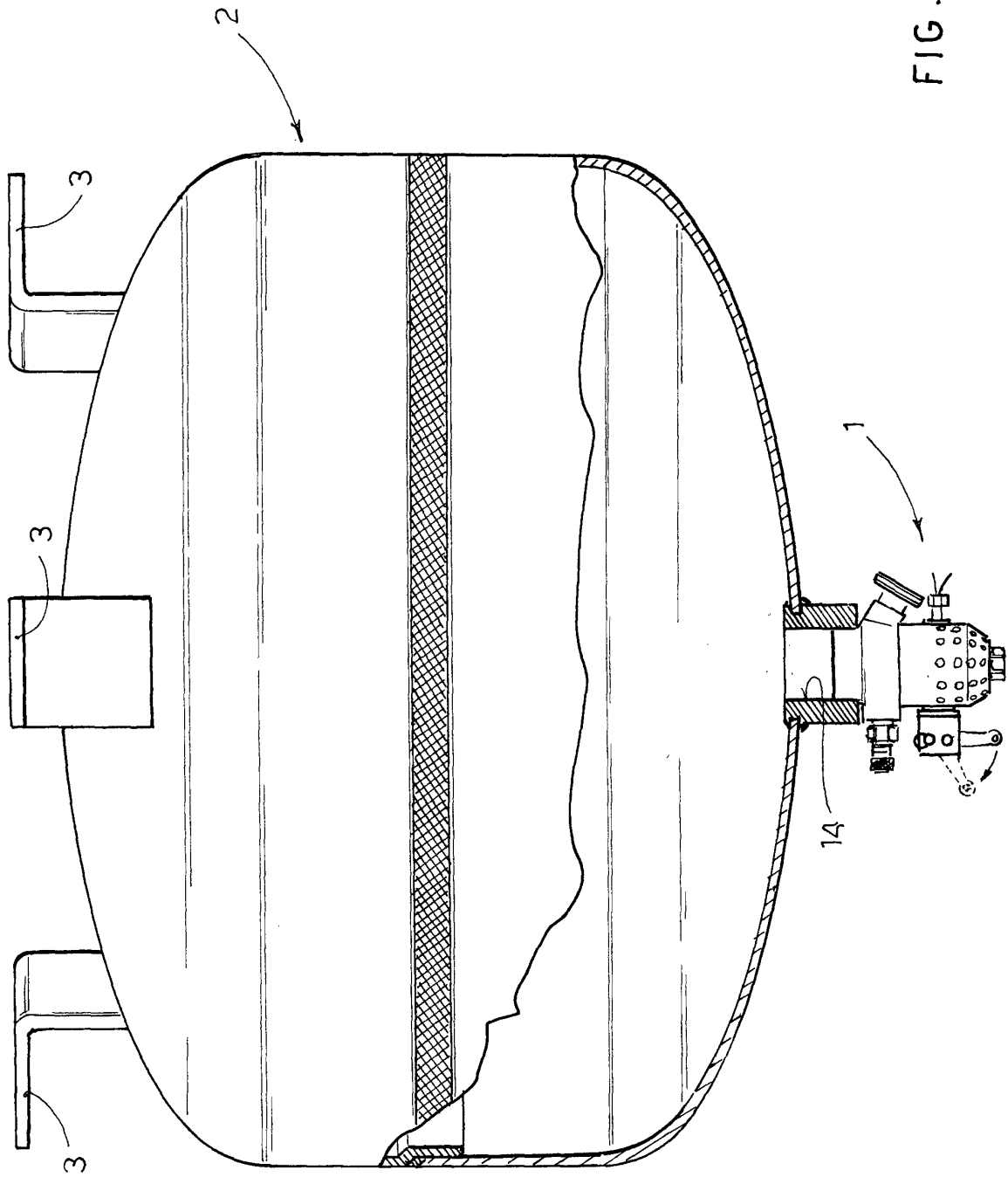
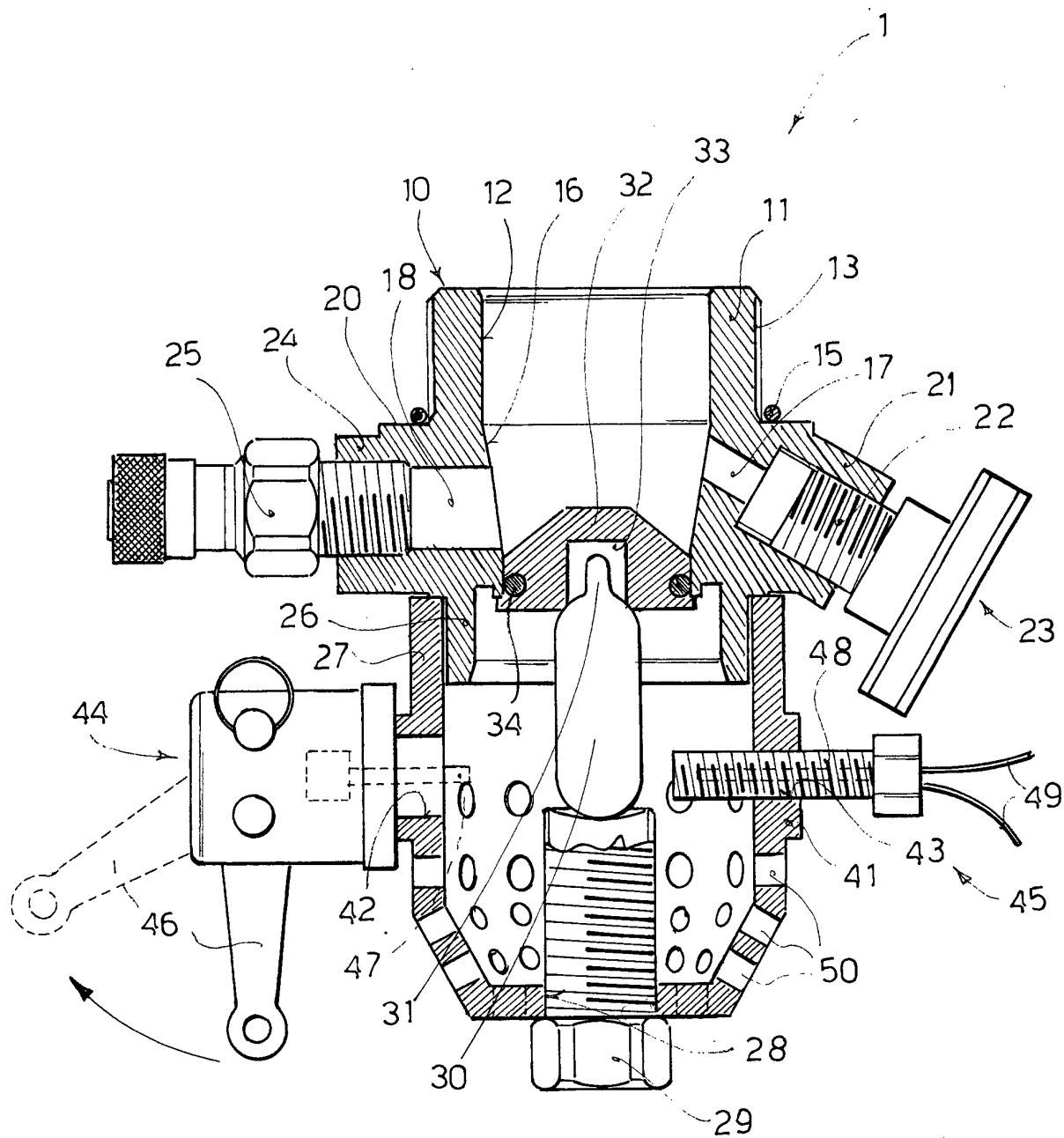


FIG. 1

FIG. 2



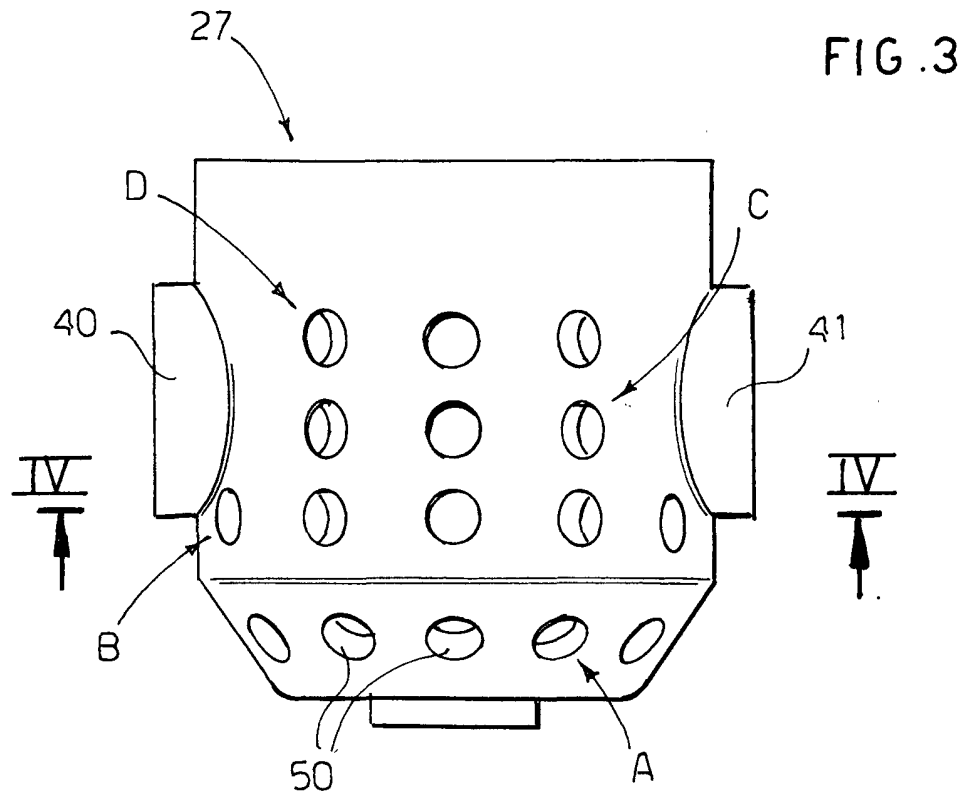


FIG. 4

