

REPLACED SHEETS		SG
☒	Description : paged ...1... to paged ...4...	
☒	Claim(s) : paged ...5... to paged ...4...	
☒	Drawing(s) : paged ...4... to paged ...4...	
☒	Abstract : paged ...7... to paged ...7...	
DATE OF RECEIPT		

1

Method and installation for fighting fire

5 The present invention relates to a method and an installation for fighting fire, in which a number of hydraulic accumulators are utilized for delivering extinguishing liquid to a number of spray heads or sprinklers.

10 The extinguishing liquid is usually driven out of the hydraulic accumulators by means of propellant gas, which is preferably nitrogen gas, though air can be used as well. The propellant gas shall generally be capable of having an initial charging pressure of about 100 bar.

15 Necessary pressure gas containers or bottles are mainly charged in advance somewhere else than where they are used. Accordingly, there is always a certain risk that the propellant gas is wasted e.g. due to a leakage, before the fire-fighting installation is actually needed. On land, this does not generally imply any larger problem, while on ships and objects comparable with them, which lack necessary charging equipment, this risk is not considered acceptable.

The object of the invention is to eliminate this problem.

25 The procedure according to the invention is mainly such that, at a first stage, the hydraulic accumulators are filled with gas up to available pressure, and subsequently at a second stage, the accumulators are filled with liquid under a desired initial charging pressure, so that the liquid compresses the gas to the desired initial charging pressure.

30 There are preferably a number of liquid containers connected in parallel and a number of propellant gas containers likewise connected in parallel to the liquid containers, whereby the propellant gas of the gas

This Sheet Has Been Replaced



containers is arranged to drive the liquid out of the liquid containers. At such an installation, the preferred procedure is that, at the first stage, all liquid containers as well as all propellant gas containers are filled with gas with available pressure, and subsequently, liquid is pumped into the liquid containers so that the liquid drives the gas out of the liquid containers and into the propellant gas containers, whereby the pressure in the propellant gas containers rises in proportion to the amount of gas from the liquid containers to the gas containers.

Accordingly, if the total volume of the liquid containers is for instance double as big as the volume of the gas containers, it is possible to achieve in this way a propellant gas pressure which is usable for fire-fighting and three times as high as the gas pressure available otherwise.

On ships, for instance, there is usually no available gas having a pressure higher than about 35 bar, i.e. so-called start air for diesel engines, etc. Thanks to the invention, this start air can charge the drive unit of a fire-fighting installation to a pressure of about 100 bar without difficulty.

When air is used as propellant gas in a hydraulic accumulator unit for fire-fighting, it is usually not desirable that the propellant air flows with the extinguishing liquid to the seat of fire. This can be avoided by providing the liquid containers with floating bodies closing an outlet aperture for the liquid after the containers have been emptied of liquid. For this purpose, the floating bodies may be provided e.g. with conical elements, which penetrate into the liquid outlet aperture when the container is empty and plug it up. The floating bodies are preferably provided with corresponding elements also on the gas side for securing that li-



quid does not penetrate into the propellant gas containers while the liquid containers are filled.

5 The invention will be described in the following in greater detail with reference to a preferred embodiment shown in the attached drawing.

10 In the drawing, a drive unit of an installation for fighting fire is indicated by reference numeral 1. The drive unit comprises four liquid containers 2 and two propellant gas containers 3; the number of the containers 2 and 3 may vary as desired. In the drawing, the drive unit is ready for use with the containers 2 entirely filled with liquid and with the propellant gas containers 3 charged to a pressure of about 100 bar. At an activation, the gas containers 3 are connected, one
15 at a time or simultaneously, to a common feeder line 4, whereby the gas presses the liquid out of the containers 2 via a common outlet line 5 and a feeder line 6 to a current fire zone 7.

20 Floating bodies arranged in the containers 2 are indicated by 8, a gas feeder line from a separate gas source, e.g. so-called start air for diesel engines etc. on a ship, is indicated by 9 and a liquid pump of about 100 bar is indicated by 10.

25 When necessary, if the propellant gas in the containers 3 were wasted for some reason, the drive unit may be charged to a state ready for use in the following way by means of start air from the line 9, which start air can be supposed to have a pressure of about 35 bar. At a first stage, all containers 2 and 3 are filled with
30 start air to a pressure of 35 bar, and subsequently, the line 9 is closed. At a second stage, the containers 2 are filled with liquid by means of the pump 10, the liquid driving the initially fed gas out of the containers 2 into the containers 3. If each container 2 and 3, re-



spectively, has the same size, the containers 3 will be charged to a pressure of about 100 bar.

5 At an activation of the installation, the floating bodies 8 sink downwards in the containers 2 as soon as the liquid is driven out and reaches the bottom of the respective container when it has been entirely emptied. Since it is not usually desirable that the propellant air flows with the extinguishing liquid to the seat of fire, the floating bodies 8 are preferably arranged to close the outlet aperture in the bottom of the respective liquid container 2. For this purpose, the floating bodies may be provided e.g. with conical elements penetrating into the liquid outlet aperture and closing it when the container is empty. The floating bodies are preferably provided with corresponding elements also on the gas side, for securing that liquid is not penetrating into the propellant gas containers while the liquid containers are filled. To construct closing elements like that does not cause any difficulty for one skilled in the art, and therefore, they are not shown in detail in the drawing.

15 The number of liquid containers 2 and gas containers 3, as well as their mutual volumes, may vary according to wishes. No separate gas containers are needed, but the liquid containers may be closed at the top, whereby it is naturally sufficient with a valve effect downwards by the floating bodies 8. Between the floating bodies 8 and the enclosing container wall, there is a distinct space, preferably somewhat bigger than the drawing gives impression of, due to which the containers 2 can have a simple "rough" construction without surface finish. Instead of so-called start air, any other available gas source can be used.





Claims:

1. A method for fighting fire, in which a drive unit comprising a number of hydraulic accumulators is utilized for delivering extinguishing liquid to a number of spray heads or sprinklers, characterized in that, at a first stage, the hydraulic accumulators (2, 3) are filled with gas up to available pressure, and subsequently at a second stage, the accumulators are filled with liquid under a desired initial charging pressure, so that the liquid compresses the gas to the desired initial charging pressure.

2. A method according to claim 1, in which the drive unit comprises a number of liquid containers connected in parallel and a number of propellant gas containers likewise connected in parallel to the liquid containers, whereby the propellant gas of the gas containers is arranged to drive the liquid out of the liquid containers, characterized in that, at the first stage, all liquid containers (2) as well as all propellant gas containers (3) are filled with gas with available pressure, and subsequently, liquid is pumped into the liquid containers so that the liquid drives the gas out of the liquid containers and into the propellant gas containers, whereby the pressure in the propellant gas containers rises in proportion to the amount of gas from the liquid containers to the gas containers.

3. A method according to claim 2, especially for ships and the like, characterized in that, at the first stage, all liquid containers (2) as well as all propellant gas containers (3) are filled with so-called start air for diesel engines, etc.

4. A method according to any of the foregoing claims, characterized in that floating





6

bodies (8) arranged in the liquid containers (2) are utilized for closing a liquid outlet aperture of the container when the container is empty and preferably also a possible inlet aperture for gas when the container is filled with liquid.

5

This Sheet Has Been Replaced

