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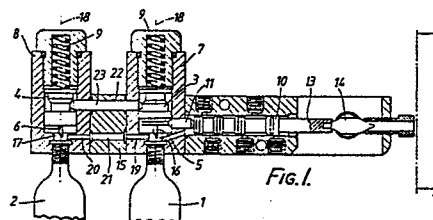
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54 **Device for the pneumatic automatic actuation of ventilation flaps.**

57 The device which is particularly for installations for the escape of smoke and heat in response to fracture of a glass container (14) in response to a preset temperature, has two pressure-fluid cartridges (1, 2) each comprising a piercing piston (3, 4) as an energy carrying unit for opening the flaps and having discharge pressure chambers (16, 17) which are associated with the pressure-fluid cartridges (1, 2) and can be connected to actuating elements of the ventilation flaps. Associated with the discharge pressure chambers (16, 17) is a safety valve (15) which controls one or more pressure-relief passages (20, 19, 21).



Description

DEVICE FOR THE PNEUMATIC AUTOMATIC ACTUATION OF VENTILATION FLAPS

The invention relates to a device for the pneumatic automatic actuation of ventilation flaps, ventilation louvres and the like in particular, in installations for the escape of smoke and heat, having preferably two pressure-fluid cartridges, each comprising a piercing piston, as an energy carrying unit, and having discharge pressure chambers associated with the pressure-fluid cartridges and able to be connected to actuating elements of the ventilation flaps.

Automatic actuating devices of the above-mentioned type are used, in particular, to open ventilation flaps in the event of an outbreak of fire and must be capable of operation in various temperature ranges. The energy carrying unit must be designed so that even at a low temperature of -20°C for example, an adequate pressure is available to open the ventilation flaps. Because of the compressibility of the pressure fluid, however, in the case of automatic actuation at very much higher temperatures, for example $+110^{\circ}\text{C}$, pressures are released which overtax the whole system.

It is the object of the present invention to provide a device of the type mentioned at the beginning wherein a reliable actuation of ventilation flaps is ensured in low temperature ranges and the whole system is not overtaxed in higher temperature ranges.

In order to solve this problem, the invention is characterised in that associated with the discharge pressure chambers is a safety valve which works depending on pressure and which controls one or more pressure relief passages. With regard to further developments of the invention, reference should be made to claims 2 to 6. In the device according to the invention, the safety valve opens pressure-relief openings, when a preset critical operating pressure is exceeded, until an operating pressure has become established which does not overstress the whole system. The safety valve or possibly valves may be mounted direct on the particular piercing-piston housing or be provided at another suitable point in the whole system, according to the space available. Preferably, however, a common safety valve is associated with the pressure cartridges. As a result of the safety valve controlling the operating pressure, assurance is provided, in the device according to the invention with two pressure-fluid cartridges, that, in the event of automatic actuation in the low temperature range of -20°C , a sufficient pressure to actuate the pressure cylinders of the ventilation flaps is available as a result of the discharge of both cartridges and at higher temperatures, excess compressed air is blown off when both cartridges are discharged.

Further details of the invention are apparent from the drawings and the following detailed description given by way of example. In the drawings:

FIG. 1 shows a cut away illustration of an embodiment of the device according to the invention in longitudinal section; and

FIG. 2 shows a diagrammatic side view on the

line II-II in Figure 1.

With reference to the drawings, the device consists of a first pressure-fluid cartridge 1 and a second pressure-fluid cartridge 2 as an energy carrying unit, with each of which cartridges there is associated a piercing piston 3 or 4 with piercing needles 5 and 6. The piercing pistons 3 and 4 are each disposed in piercing-piston housings 7 and 8 respectively and are each loaded, at their ends opposite to the piercing needles 5 and 6, by a compression spring 9 supported on the piercing-piston housing. The piercing pistons 3 and 4 are held in their locked position by a locking unit which comprises a locking rod consisting of a 5/2-way valve 10 and a pin 11, as well as a locking member 23. The 5/2-way valve 10 has, at its end remote from the piercing piston 3 of the first pressure-fluid cartridge 1, a shank-like extension 13 in which a breakable glass container 14 engages. The glass container 14 breaks at a preset temperature as a result of which the locking device is activated in the sense of unlocking.

According to the invention, the pressure of the pressure chambers 16, 17 of the device can be relieved through a safety valve 15 in that, by means of the safety valve 15, the discharge pressure chambers 16 and 17 of the first and second pressure-fluid cartridges 1, 2 are connected to the safety valve 15 through pressure-relief bores 19, 20. In the example of embodiment illustrated in Figure 1, the pressure-relief bores 19, 20 consist of the bores 19, 20 which extend rectilinearly in the piercing-piston housings 7, 8 substantially perpendicular to the central longitudinal axis 18 of the piercing pistons 3, 4 and are mutually aligned with one another and which are connected to one another through a pressure-relief bore 21 formed inside the safety valve 15 disposed between the two piercing housings 7, 8. Above the pressure-relief bore 21, the safety valve 15 comprises a passage 22 for a locking member 23 of the piercing piston 4 so that the safety valve 15 can be disposed between the two piercing pistons 3 and 4 and held by these in an extremely space-saving manner. The valve body 15' of the safety valve 15 for blowing off excess compressed air, is disposed centrally in the pressure-relief bore 21 of the safety valve 15.

Claims

1. A device for the pneumatic automatic actuation of ventilation flaps, ventilation louvres and the like in particular, in installations for the escape of smoke and heat, having preferably two pressure-fluid cartridges (1, 2) each comprising a piercing piston (3, 4) as an energy carrying unit and having discharge pressure chambers (16, 17) which are associated with the pressure-fluid cartridges (1, 2) and can be

connected to actuating elements of the ventilation flaps, characterised in that associated with the discharge pressure chambers (16, 17) is a safety valve (15) which works depending on pressure and which controls one or more pressure-relief passages (20, 19, 21). 5

2. A device as claimed in claim 1, characterised in that a common safety valve (15) is associated with the discharge pressure chambers (16, 17) of the pressure-fluid cartridges. 10

3. A device as claimed in claim 2, characterised in that the safety valve (15), bearing against the two piercing-piston housings (7, 8) is held by these. 15

4. A device as claimed in claim 3, characterised in that a rectilinear bore (19, 20) extending substantially perpendicular to the central longitudinal axis (18) of the piercing pistons (3, 4) is provided in each of the piercing-piston housings (7, 8) for the pressure relief, and the bores (19, 20) are mutually aligned with one another and connected to one another through a pressure-relief bore (21) provided in the safety valve (15). 20 25

5. A device as claimed in one of the claims 1 to 3, characterised in that the valve body (15') is provided substantially centrally in the pressure-relief bore (21) provided in the safety valve (15).

6. A device as claimed in one of the claims 3 to 5, characterised in that the safety valve (15) comprises a passage (22) for a locking member (23) of a piercing piston (4). 30

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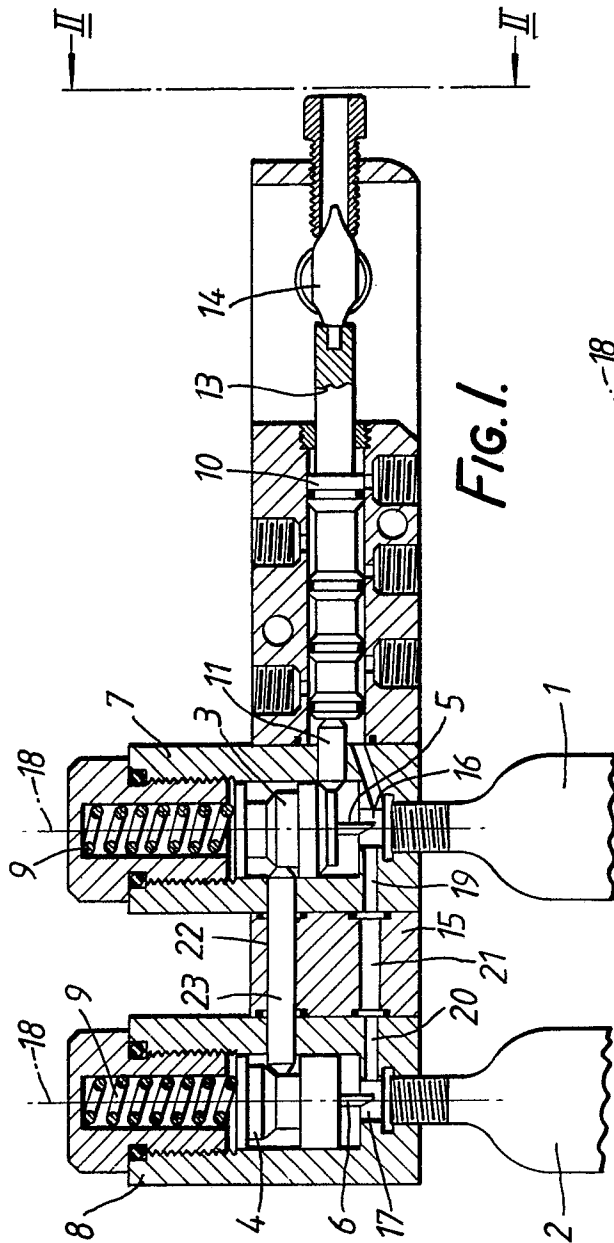


FIG. 1.

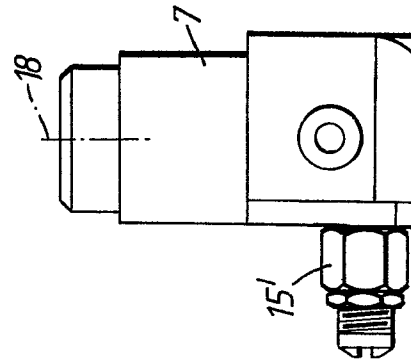


FIG. 2.



EP 87 30 1624

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.4)
P,X	DE-A-3 517 133 (Fa.J. EBERSPÄCHER) * Page 6, lines 6-28; figures 2,3 * ---	1-3	A 62 C 3/14
A	DE-A-3 429 178 (J. FORTMEIER) * Figure 1 * ---	6	
P,A	DE-A-3 502 992 (H. ESSMANN) ---		
A	US-A-3 420 000 (K. ESSER) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			A 62 C F 16 K F 17 C E 05 F
Place of search THE HAGUE		Date of completion of the search 04-06-1987	Examiner WOHLRAPP R.G.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			