

(19)



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(11)

EP 0 701 465 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
16.07.1997 Bulletin 1997/29

(51) Int. Cl.⁶: **A62C 31/02**, A62C 37/14,
B05B 1/04

(21) Application number: **94916157.4**

(86) International application number:
PCT/DK94/00195

(22) Date of filing: **18.05.1994**

(87) International publication number:
WO 94/26354 (24.11.1994 Gazette 1994/26)

(54) **A SPRINKLER**

SPRÜHDÜSE

TETE D'EXTINCTION

(84) Designated Contracting States:
DE DK FR GB

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(30) Priority: **18.05.1993 DK 578/93**

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(43) Date of publication of application:
20.03.1996 Bulletin 1996/12

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(56) References cited:
EP-A- 0 505 571 **US-A- 3 830 434**
US-A- 4 279 309 **US-A- 4 585 069**

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Description

The invention concerns a sprinkler for mounting on a pipe in which a fire extinguishing liquid is fed under pressure. A fixed pipe installation having such a sprinkler is used e.g. in buildings and ships where the sprinkler is provided with a release mechanism which keeps the outlet orifice of the sprinkler closed in the static state, and which opens the outlet orifice of the sprinkler when actuated in case of a fire so that the fire-extinguishing liquid can flow out. The sprinkler has a deflector arranged downstream of the outlet orifice, and when the outflowing liquid hits the deflector, the liquid is spread in the form of drops and mist with a view to extinguishing a fire. A sprinkler of this type, but without an actuation mechanism may e.g. be used in irrigation systems.

In sprinklers of the type mentioned here there is a carefully attuned and well-defined interplay between the outlet orifice and the deflector, which together are attuned to give optimum spreading and drop formation or atomization of the fire extinguishing liquid, which is typically water. In known sprinklers the outlet orifice and the deflector are rotational symmetrical about the longitudinal axis of the sprinkler, so that the outflowing liquid is spread uniformly in all directions. Such sprinklers are said to have a circular spread diagram. For use in smaller, rectangular rooms or corridors in which the sprinkler is arranged centrally in the room and near the ceiling, it is desirable to adapt the spread diagram of the sprinkler to the geometry of the room so that the sprinkler spreads the extinguishing agent most in the longitudinal direction of the room, while spreading transverse to the longitudinal direction is restricted.

US-A-4 279 309 and US-A-4 585 069 show a sprinkler having an elongate outlet orifice which gives an elongate spread diagram.

To restrict the consumption of extinguishing agent it is moreover desirable that the sprinkler spreads the extinguishing agent in a finely atomized form like in EP-A-0 505 571. It is the object of the invention to provide a sprinkler which fulfills these wishes.

This object is achieved by a sprinkler according to the invention, since an outlet cross-section consisting of several slots per se gives a certain drop formation of the extinguishing liquid, because the pressure drop with such an outlet orifice is greater than with a simple circular or oval orifice. The extinguishing liquid is thus atomized in two steps, viz. first at the outlet orifice and then at the deflector. This results in a particularly effective atomization of the extinguishing liquid, so that a fire can be extinguished with a greatly reduced consumption of extinguishing liquid.

The outlet orifice may advantageously be made star-shaped, and an oval star shape moreover results in an elongate spread pattern.

The invention will be described more fully below with reference to the drawing, in which

fig. 1 shows a sprinkler seen from the side and partially in longitudinal section,

fig. 2 is a bottom view of the sprinkler of fig. 1,

fig. 3 is a vertical section through an outlet nozzle which may be used in the sprinkler of fig. 1,

fig. 4 is a top view of the outlet nozzle in fig. 3,

fig. 5 is a spread diagram for a sprinkler according to figures 1 to 4, and

fig. 6 shows the outlet orifice of the outlet nozzle according to the invention.

Figures 1 and 5 do not show an embodiment of the invention but are for illustrative purpose.

Fig. 1 shows a sprinkler having a sprinkler housing 10 of metal. The upper end of the sprinkler housing 10 has a cylindrical threaded part 11 by means of which the sprinkler can be screwed into a pipe installation. The threaded part 11 is upwardly provided with a filter or a net 12 to prevent solid particles from the pipe installation from flowing into the sprinkler. An outlet nozzle 20 is arranged downstream of the filter 12 and in the cylindrical bore in the threaded part 11, said nozzle having an upwardly open, hemispherical cavity 21 whose bottom is formed with an outlet orifice 22, which will be described later. Downstream of the outlet nozzle 20 the sprinkler housing 10 has an outlet 2 which is closed by a plug 13, which is kept in position by a glass ampoule or bulb 14, whose upstream end 14a engages the plug 13, and whose downstream end 14b engages a screw 15, which is screwed into the downstream end of the sprinkler housing 10 carried by two arms 16. Outwardly on its downstream end the sprinkler housing has a deflector 17 of a known structure, which is shown clearly in fig. 2.

The bulb 14 keeps the plug 13 in position in the outlet orifice 12 by means of the pressure from the screw 15 so that the plug 13 fits tightly in the outlet 2, thereby making the sprinkler tight. The bulb 14 is of a known structure and contains a medium which expands when heated, and when a predetermined critical temperature is exceeded, the bulb 14 bursts, thereby releasing the plug 13, and owing to the pressure in the pipe system the plug 13 will be forced out and thereby provide free discharge of water or extinguishing liquid from the pipe system. The extinguishing liquid then flows through the outlet orifice 22 in the outlet nozzle 20 and hits the deflector 17, which spreads the outflowing water in a known manner.

It will be seen from fig. 4 that the outlet orifice 22 has a cross-section which is defined by two semi-circular arcs 23a and 23b of uniform diameter, which are interconnected by two parallel lines 24a and 24b, so that the cross-section of the outlet orifice 22 is oval.

An oval outlet orifice 22 like in fig. 4, whose major

axis is 6 mm and whose minor axis is 4 mm, provides an oval spread diagram as shown in fig. 5, in which the major axis of the spread diagram is located in the same direction as the major axis of the outlet orifice. It will be seen from fig. 5 that this spread diagram is ideal for an elongate room, such as e.g. a ship's cabin having the dimensions 5 m x 3 m. A sprinkler having such a spread diagram is also ideal for installation in elongate, narrow passageways and corridors in which a plurality of sprinklers are installed in longitudinal spaced relationship in the corridor.

Fig. 6 shows an outlet nozzle 30 having a cross-shaped outlet orifice 32. The outlet orifice 32 consists of two slots 33 and 34 which are of different length and intersect each other at a right angle. The outlet nozzle 30 is disc-shaped and made by punching of a metal plate. The cross-shaped outlet orifice 32 has a cross-section which causes a significant pressure drop for the outflowing extinguishing liquid, and this results in a certain atomization or drop formation of the extinguishing liquid before it hits the deflector 17.

The slot 33 is longer than the slot 34, which results in an elongate spread pattern as is the case for the oval outlet orifice 22 shown in figure 4.

The outlet orifice may also consist of three or more intersecting slots which form a star, which, together with the deflector, gives the optimal atomisation or drop formation of the extinguishing liquid. Also a star-shaped outlet orifice can be made "oval" in that it consists of slots of different length, and the spread diagram can hereby be made correspondingly elongate.

The deviation of the spread diagram from circular may likewise be varied by varying the proportion between the major axis and minor axis of the outlet orifice, and the outlet orifice may be formed as an elongate, narrow gap or as two or more parallel or intersecting slots with a view to obtaining special spread diagrams. Finally, the outlet nozzle may have several smaller outlet orifices which are not necessarily parallel and hereby additionally form the spread diagram and increase the atomization of the extinguishing liquid before it hits the deflector. In certain uses, a suitable shape of the outlet orifice can even provide such a degree of atomization and spreading of the extinguishing liquid that a deflector is superfluous.

Claims

1. A sprinkler having an outlet orifice (30) for a liquid and a deflector (17) downstream of the outlet orifice for spreading liquid flowing out from the outlet orifice, **characterized** in that the outlet orifice (30) is formed by at least two elongate slots (32, 33).
2. A sprinkler according to claim 1, **characterized** in that the slots (32, 33) intersect each other.
3. A sprinkler according to claim 2, **characterized** in that the slots (32, 33) are of different length.

4. A sprinkler according to claim 3, **characterized** in that the peripheral ends of the slots are located on an oval, closed curve.

Patentansprüche

1. Sprühdüse mit einer Auslaßöffnung (30) für eine Flüssigkeit und einem stromabwärts von der Auslaßöffnung angeordnetem Umlenkelement (17) zum Versprühen einer aus der Auslaßöffnung fließenden Flüssigkeit, **dadurch gekennzeichnet**, daß die Auslaßöffnung (30) durch mindestens zwei längliche Schlitz (32, 33) gebildet ist.
2. Sprühdüse nach Anspruch 1, **dadurch gekennzeichnet**, daß die Schlitz (32, 33) sich jeweils schneiden.
3. Sprühdüse nach Anspruch 2, **dadurch gekennzeichnet**, daß die Schlitz (32, 33) unterschiedlich lang sind.
4. Sprühdüse nach Anspruch 3, **dadurch gekennzeichnet**, daß die äußeren Enden der Schlitz auf einer ovalen, geschlossenen Kurve angeordnet sind.

Revendications

1. Tête d'extinction comportant un orifice de sortie (30) destiné à un liquide et un déflecteur (17) en aval de l'orifice de sortie destiné à la dispersion du liquide s'écoulant en dehors à partir de l'orifice de sortie, caractérisé en ce que l'orifice de sortie (30) est constitué d'au moins deux fentes allongées (32,33).
2. Tête d'extinction selon la revendication 1, caractérisé en ce que les fentes (32,33) se croisent l'une et l'autre.
3. Tête d'extinction selon la revendication 2 caractérisé en ce que les fentes (32,33) sont de longueurs différentes.
4. Tête d'extinction selon la revendication 3 caractérisé en ce que les extrémités périphériques des fentes sont situées sur une courbe ovale et fermée.



