(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 964 340 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
28.09.2016 Bulletin 2016/39

(21) Application number: **13708399.4**

(22) Date of filing: **04.03.2013**

(51) Int Cl.:
A62C 31/05 *(2006.01)* ***A62C 37/11*** *(2006.01)*

(86) International application number:
PCT/EP2013/054278

(87) International publication number:
WO 2014/135189 (12.09.2014 Gazette 2014/37)

(54) HEAD TO DISCHARGE A FIRE FIGHTING AGENT

KOPF ZUR ENTLADUNG EINES BRANDBEKÄMPFUNGSMITTELS

TÊTE D'ÉVACUATION D'AGENT EXTINCTEUR

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
13.01.2016 Bulletin 2016/02

(73) Proprietors:
- **Atkinson, Dave**
  2018 Antwerp (BE)
- **Atkinson, Clive**
  West Bridgeford, Nottingham NG2 5DZ (GB)

(72) Inventor: **ATKINSON, Dave**
B-2018 Antwerp (BE)

(74) Representative: **Haverkamp, Jens**
Gartenstrasse 61
58636 Iserlohn (DE)

(56) References cited:
US-A- 4 739 934
US-A1- 2002 134 557
US-B1- 6 209 654

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 964 340 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The invention is related to a head to discharge a fire fighting agent, such as water, in particular a fire sprinkler head comprising a plastic body.

[0002] The heads referenced to above are usually referred to as fire sprinkler heads or simply sprinklers in case they are designed to discharge water as fire fighting agent. Such sprinklers are an essential tool in fighting fires. Such sprinklers comprise a fire sprinkler head connected to a water bearing installation as fire fighting agent bearing installation. Since the fire fighting agent is typically held under certain pressure, which could also be a static pressure within the installation the agent, may also be referred to as standing charge. The fire sprinkler heads are typically arranged in a certain distance from each other. Each fire sprinkler head is constructed as a temperature sensitive water drain, opening if the sprinkler head is exposed to a certain temperature. Such sprinkler is held in its closed state - its surveillance mode - by a thermal detector, which depending on its nature brakes or melts in order to release water from the installation. Then, the sprinkler head is in its fire fighting mode. Typically with these kind of installations the thermal detectors used comprise a glass tube filled with an alcohol. The glass tubes are held in place between an abutment member and a sealing member, which sealing member seals the water outlet, with a predetermined torque. In order to apply the necessary pressure to the glass tube to provide the intended sealing function, the sealing member is manufactured from brass and the other parts of the sprinkler are manufactured of metal, typical also of brass. In case such glass tube is exposed to heat the liquid therein attends to expand and due to the raising pressure breaks the glass at a certain pressure indicating a certain temperature. These kind or thermal detectors are also referred to as frangible bulb. The sealing member is then pushed away from its seat by the water in the water bearing installation, which then flows out. In order to distribute the water exiting the body of the sprinkler deflection means are arranged below the outlet opening. The deflection means are needed to brake up the flow of water for its distribution over a certain area.

[0003] In WO 02/083245 A1 a fire sprinkler head is disclosed, of which the body is manufactured by way of an injection moulding process of plastic material. Between two plastic parts one being the moulded plastic body and the other being a diffusor head a sealing portion is arranged. By way of the sealing portion the outlet of a hollow central passage extending through the body is closed. Apart of the diffusor head is resting against the sealing portion and serves as an abutment. The diffusor head is held in this locking position with a link portion. The link portion is a meltable fuse element - thus being sensitive to temperature. The link portion melts at a certain temperature, which in turn releases the diffusor head from its position locking the outlet of the central passage. Due to the pressure in the installation the sealing member then brakes and pushes the diffusor head into its diffusing arrangement at a certain distance to the outlet of the central passage so that water may flow out and is distributed in the vicinity.

[0004] The prior art fire sprinkler heads have in common, that several elements need to be manufactured individually and then be assembled. Further, the sprinkler heads are designed to be reusable. With those using a frangible bulb as thermal detector these and the sealing member are replaced to have the fire sprinkler head work again. With the device with the breakable sealing this and the link portion are replaced.

[0005] In the light of the prior art sketched out above it is an object of the invention to provide a fire sprinkler head, which is simple in its construction and preferably easier in its manufacturing process, but still provides for an effective temporary fire barrier.

[0006] The technical problem is solved by way of a fire fighting agent discharge head according to claim 1.

[0007] This head comprises one or more predetermined breaking areas, which in the surveillance mode of the head lock the discharge openings and which break by failing for example by melting at least in part upon the exposure of heat. These breaking areas are referred to as locking members. The thermal sensitive locking member closing a discharge opening is designed to fail at a predetermined temperature, which temperature is well above the maximum ambient temperature, in which the head is to be arranged. Typically the failing temperature may be designed that the locking member melts upon a heat exposure being approximately 30° C above the maximum ambient temperature level. Of course, other temperature levels may be applied in the same manner. The temperature sensitivity of the locking member being the thermal detector of this sprinkler head is designed that it melts earlier and/or quicker than the body of the head being manufactured of plastic material.

[0008] The thermal sensitivity of the locking member as sketched out above may even be achieved by using one and the same plastic material for the body and the locking member. The thermal sensitivity may be achieved by providing the locking member with a thinner wall thickness compared to the wall thickness of the body in the area adjacent to such discharge opening. The quicker response characteristic of the locking member to heat exposure may also be achieved in that the outside surface of the locking member is designed to have a higher heat absorbing character than the surface areas of the body adjacent to such locking member. Such quicker heat response characteristic may be achieved by providing the outside surface of the locking member with a bigger surface area, for example providing it with a higher roughness and/or by providing the outside of the locking member with a heat absorbing colour. The adjacent areas of the body would then accordingly show a lower degree of roughness and/or a heat reflecting or less heat absorbing colour or coating of such kind.

[0009] One of the major benefits of this concept is, that

the head may be manufactured by way of a moulding process, which is preferably an injection moulding process, without that any further assembly steps need to be carried out. Therefore the process for manufacturing such head is to be regarded as a low cost manufacturing process, thus providing heads on a low cost base.

[0010] Due to the concept described it is possible to design the one or typically more discharge openings with thermal sensitive locking members closing the openings with a high degree of freedom to design the openings and their distribution in the body of the head. This makes its possible that the discharge openings are designed with a cross sectional area, small enough that for example with use of water as fire fighting agent the pressurised water of the water bearing installation, to which the sprinkler head is joined, exits in the form of small size water jets or even as spray. Therefore basically with this head it is not necessary to provide for a deflection member to break up the flow of water to be distributed as is necessary with prior art heads.

[0011] Further, with this concept it is easy to provide with virtually one and the same moulding tool a heads with discharge openings closed by thermal sensitive locking member, which discharge openings are arranged at different positions. As such it is for example possible to design the discharge section of the head with discharge openings arranged in an annular arrangement as a first alternative and simply by slightly amending the moulding surface provide a head with its discharge openings arranged only in a certain section, for example extending only over a semi-circle or even less.

[0012] An interesting aspect of the concept claimed is that the difference in the failing response upon heat exposure between the at least one looking member and the other parts of the body does not necessarily be very large. The plastic material used and the geometry of the body is designed, that it retains its integrity until the at least one locking member melts and thereby opens its discharge opening. Then, the fire fighting agent of the installation, to which the head is joined will flow through the body, thereby cooling the body from its inside. The best cooling effects may be achieved, if the fire fighting agent is a liquid, in particular water. The fire fighting agent in the installation is well below the failing point of the locking member. Therefore, even upon exposure to heat above the failing point of the plastic used to manufacture the body it will retain its integrity due to the cooling effect of the agent flowing through the body. A head of this kind may thus be manufactured from a plastic material, which does not necessarily be of the usual kind used for high temperature applications. Therefore, such head may be manufactured from a plastic material, which is cheaper than heat resistant plastic material.

[0013] The thermal sensitive locking member closing the discharge openings in the surveillance mode of the head may also be manufactured from another plastic material than the body, for example by way of a two or more component moulding process. With such embodiment a plastic material of higher temperature resistance may be used for the body than the one used to resemble the thermal sensitive locking members.

[0014] The heads described above are very effective in building a temporary fire barrier. Since with this concept heads may be designed as spray nozzles the water exiting such head exits this with a rather large surface area. With this smoke and dust may be tied down to a certain degree. Further, the large surface area of the water exiting the head enhances its vaporisation, which is one of the effects to provide for an effective fire barrier.

[0015] The connecting means to connect the head to a water bearing installation will typically be designed as a threaded section to be screwed into an opening with a complementary threaded section of the installation. Of course, other connection means like bajonett-couplings or the like may also be used.

[0016] Should a tool be needed to fasten the sprinkler head to the installation, according to a preferred embodiment the body of the sprinkler head shows one or more tool application faces. These are arranged to make up a tool application section of the body enabling to place a tool and then introduce the necessary torque to fasten the sprinkler head to the installation.

[0017] The head may virtually be used with many different kinds of fire fighting agent bearing systems. Therefore its use is not only limited to a use in buildings. In particular due to its compact size it may also be used for example with combustion engines having a cooling circuit to cool the engine. The liquid therein is then to be regarded as the fire fighting agent. Having employed one or more of these fire sprinklers in the cooling system of a combustion engine, an automatic fire fighting system may be established, to target high risk areas of the engine and/or the system. In a building the heads may be used instead of the usual sprinkler heads arranged in the ceiling or in the walls. According to another embodiment of use of such heads these are joined to the water bearing heating installation. In such application a sprinkler head may be arranged in the radiator opening, in which usually the venting plug is arranged. With such application the head may also provide the functionality of venting the water bearing system, for example the radiator. Should the head be designed with a threaded section as connections means, then the venting functionality may be realised by way of a groove cutting across the threads of the threaded section. The groove will preferably not cut across all threads in the longitudinal extension of the threaded section but leave one or more windings of the thread opposite to the distal end of the threaded section uncut. The head may be used as a venting plug in the same manner as conventional venting plugs, but with the further fire fighting functionality.

[0018] Further at advantages and embodiments will become apparent with the description of an embodiment of the invention under reference to the figures. These depict:

Fig. 1: as side elevational view of a head according to a first embodiment of the invention,

Fig. 2: a longitudinal cross section of the head of figure 1,

Fig. 3: an enlarged detail of the cross sectional view of the head of figure 2,

Fig. 4: a top view of the head of figure 1,

Fig. 5: a bottom view of the head of figure 1, and

Fig. 6: a cross sectional view depicting another embodiment according to the invention.

[0019] A head 1 to discharge a fire fighting agent is according to the depicted embodiment manufactured as one sole solid device. The head 1 comprises a body 2. The body 2 of the head 1 is in the embodiment depicted in figure 1 divided into three sections, namely a threaded section 3 as connecting means to connect the head to a fire fighting agent bearing installation, a discharge section 4, through which water exits in the fire fighting mode of the head 1, and a tool attachment section 5. The tool attachment section 5 is used to apply a tool to the body 2 in order to screw the body 2 with its threaded section 3 into an opening comprising a complementary threaded section of a fire fighting agent bearing installation. In the present embodiment the tool attachment section 5 is provided by way of six side faces facing in the radial direction and arranged according to a hexagon. Thus, a nut or a wrench may be applied to the tool attachment section 5 in order to apply the torque needed to screw the threaded section 3 of the head 1 into an opening of the installation. The head 1 is manufactured by way of an injection moulding process form a plastic material. In the depicted embodiment polypropylene has been used to manufacture the head 1.

[0020] The head 1 is intended to be used with a water bearing installation. Therefore, in the following by way of the described example the fire fighting agent is water. It will be well understood, that also other fire fighting agents, like other fluids or gases or mixtures thereof (foams) may be employed.

[0021] As to be seen from the longitudinal cross section of figure 2 the head 1 comprises a central passage 6, which extends through the threaded section 3 and is open at the distal end 7 of the threaded section 3. When connected to a water bearing installation water will enter the central passage 6 of the body 2 of the head 1. The central passage 6 leads into a cavity 8 having its maximum diameter in the discharge section 4. The central passage 6 and the cavity 8 are rotation-symmetric, thus show a circular cross sectional geometry. The cavity 8 may be understood as a manifold.

[0022] The discharge section 4 of the depicted embodiment comprises four discharge openings 9, which are closed in the surveillance mode of the head 1. The surveillance mode of the head 1 is the mode, in which no water exits the head 1. The surveillance mode of the head 1 is distinguished from its fire fighting mode, in which water exits the head 1 through the discharge openings 9. It is to be understood, that in the fire fighting mode the discharge openings 9 are at least partways open.

[0023] In the present embodiment the discharge openings 9 are closed to have the head 1 in its surveillance mode. The discharge openings 9 are closed by thermal sensitive locking members 10, which may also be addressed as thermal detectors. In the embodiment depicted in figures 1 to 5, the locking members 10 are provided by a thinning of the wall thickness of the discharge section 4 as better to been seen in the enlarged detail of figure 3. The thinning is worked in the present embodiment with a concave shape at the outside surface of the discharge section 4. The body 2 and as such the wall 11 of the discharge section 4 and the locking members 10 as part of the wall 11 are manufactured from one and the same plastic material.

[0024] The locking members 10 show a higher temperature sensitivity, which means, that these respond to heat exposure with thermal failure faster than the rest of the body 2 and in particular the wall 11 of the discharge section 4. Since the wall 11 and the locking member 10 are manufactured of one and the same plastic material the failing point as such of the plastic material resembling the locking members 10 and the other parts of the body 2 of the head 1 is the same. In order to ensure, that the locking members 10 show a higher temperature sensitivity and thus fail before the rest of the body looses its integrity, the thickness of the locking member 10 is reduced compared to the thickness of the adjacent walls 11. In the embodiment depicted the wall thinning reduces the thickness of the wall 11 in a maximum of a little more than 50 %. Already from this measure it will become apparent, that upon heat exposure even if the outside of the wall 11 should start to melt, the locking members 10 will fail well before any other portion of the wall 11 fails. This is to be attributed to the wall thinning. Since the installation, to which the head 1 is joined to is water bearing and since the water in such installation is typically under pressure from the inside of the locking members 10 the pressure within the installation is working against the locking members 10. Therefore the fail of the locking members 10 is initiated by heat exposure, but is supported by the water pressure within the cavity 8 of the body 2. It is not necessary, that the locking member 10 melts completely, before water is discharged through the discharge openings 9. It is only necessary, that the locking members 10 are due to the heat they are exposed to, they weaken sufficiently, that they cannot withstand the pressure within the installation and in the cavity 8. Then the locking members 10 exposed to thermal and pressure effects fail open and the discharge openings 9 are open. The head 1 is then in its fire fighting mode. From the forgoing it will be apparent, that the fire fighting mode

cannot be reversed to the surveillance mode. Therefore, once the head 1 has been brought into its fire fighting mode, have to be replaced.

[0025] Already the concave geometry of the locking members 10 enhances collecting more heat due to be bigger surface area than the adjacent sections of the wall 11. In the depicted embodiment as a further measure to have the locking member 10 respond to heat and fail more rapidly than the adjacent sections of the wall 11 the outside surface 12 of the locking members 10 is roughened. This enlarges the outside surface area of the locking members 10, thereby collecting more heat. The outside surface 13 of the wall 11 in contrast is provided with a polished surface which reflects the radiant heat. As a further possible measure the outside surface of the locking members 10 could be provided with a colour, which absorbs more heat than the colour on the outside surface 13 of the adjacent wall 11.

[0026] As to be seen from the top view of the head 1 of figure 4 the four discharge openings 9 are arranged according to an annular geometry, each discharge opening 9 being spaced form its neighbouring discharge opening by an angle of 90°.

[0027] The embodiment depicted in figures 1 to 5 may also be used as a venting plug. In order to achieve this further functionality of the head 1 a venting groove 14 is arranged within its threaded section 3. In the depicted embodiment the venting groove 14 extends parallel to the longitudinal extension of the threaded section 3. The venting groove 14 cuts the threads of the threaded section 3 beginning at the distal end 7 thereof. The groove 14 does not cut all threads but leaves one or two windings at the other end of the threaded section 3 uncut. When the head 1 is introduced for example into a water bearing radiator air can escape through the air venting groove 14, if the threaded section is not screwed into the complementary opening of the radiator to its end, thus giving by way of the air venting groove 14 a path, on which air within the installation may escape. In the present embodiment the air venting groove 14 as a V-cross sectional geometry as to be seen in the bottom view of figure 5 of the head 1. If the head 1 is screwed with this threaded section 3 completely into the complementary opening of the installation, then the air passage of the venting groove 14 is blocked.

[0028] Instead of a groove as described above also a tapered thread may be applied to provide the air path needed for such venting functionality.

[0029] In case a sealing arrangement between the head 1 and the installation cannot be achieved by the properties of the plastic material of the body 2, a sealing ring may be placed under the annular flange 15 of the tool attachment section 5 facing to the distal end 7 of the threaded section 3. The same measure could be taken, in case the head is exposed to excessive vibration. Therefore the further descriptions referring to such ring as a sealing ring are also applicable for the use of such ring as a dampening ring. Such sealing ring may be manufactured as a one solid piece with the body 2 by employing a two component moulding process. In a first shot the body 2 would be manufactured from a first plastic material. In a second injection shot the sealing ring would be manufactured with another plastic material having the properties needed to provide the intended seal functionality. Such sealing ring may also be used as a vibration damper and/or device to hinder that the mounted head loosens, in case the water bearing installation is used to vibrate like this is the fact with combustion engines and their cooling circuit.

[0030] In case the head 1 and its discharge section 4 respectively is exposed to heat the locking members 10 due to their geometry and the further measures sketched out above will fail once they have been heated up to a certain temperature. This temperature is approximately 30° C higher than the maximum operating temperature the locking members 10 are confronted in the surveillance mode of the head 1. Since the head 1 is adapted to be used as a venting plug in a water bearing heating installation, which could be a heating water installation the temperature of fail of the locking members 10 will be approximately 30° C higher than the maximum operating temperature of the water in the heating system, which temperature is assumed to be higher in its maximum temperature than the temperature at the outside of the head 1. Due to the concave geometry of the locking members 10 the fail will most probably initiate at the point, where the locking members 10 show their smallest wall thickness. Then, supported by the pressure within the installation the discharge openings 9 are opened. These basically will be smaller in diameter than the diameter of the locking members 10. Thus, the discharge openings 9 then open are small sized to allow water exiting by way of small sized spray.

[0031] Figure 6 shows a head 1.1 in its longitudinal section according to another embodiment. The head 1.1 is principle designed as the head 1 described to figures 1 to 5. Therefore the descriptions of the head 1 also apply to the head 1.1. The head 1.1 differs from the head 1 in that the locking members 10.1 are manufactured of a different plastic material than the rest of the body 2.1. The head 1.1 is manufactured by way of a two component injection moulding process, whereas in a first shot the body 2.1 without the locking members 10.1 is manufactured. In a second injection moulding step the plastic material resembling the locking members 10.1 is introduced into the discharge openings, closing them. The plastic material of the locking members 10.1 show a lower failing point than the plastic material, of which the other part of the body 2.1 is manufactured from. The principal of work of this head 1.1 is identical to the one described above with reference to figures 1 to 5.

[0032] From the forgoing description of the invention it will have become apparent, that there are numerous measures to be taken individually or in combination with each other to provide locking members, which fail more quickly when exposed to heat than the adjacent parts of

the body of the head. These measures are:

- wall thinning;
- providing the outer surface geometry of the locking members with an enlarged surface geometry, being for example concave;
- providing a difference in surface roughness between the outside surface of the locking members and the adjacent outside surface of the discharge section, whereas the outside surface of the locking member shows a higher roughness than the adjacent surface;
- providing the outside surface of the locking members with a heat absorbing colour. In such embodiment it is preferred, that the outside surface of the adjacent wall portions are provided with a less heat absorbing colour or finishing;
- providing locking members manufactured from a plastic material having a lower failing point than the adjacent parts of the body.

[0033] Providing the head 1 with rather small sized discharge openings 9 when in their open mode has the further advantage, that the water supplied by the water bearing installation does not flow out as fast as this is used to be observed with conventional heads. This is another measure, which enhances the vaporisation of the water and therefore supports the build up of an effective fire barrier.

[0034] With the possibilities of injection moulding the discharge openings may be designed with a non-uniform cross-sectional geometry and/or are a in the direction of their longitudinal axis. It is therefore possible to provide a cone-like geometry of the discharge opening becoming smaller in the direction to the outside and thus designing a discharge opening similar to an orifice. This results in a higher efficiency rate of release.

[0035] The invention disclosed may be employed in numerous other manners. The specific description of the embodiment is only a description of possible embodiments. Therefore the disclosure is not limited to these embodiments.

Reference numerals

[0036]

1, 1.1	fire sprinkler head
2,2.1	body
3	threaded section
4	discharge section
5	tool attachment section
6	central passage
7	distal end
8	cavity
9	discharge opening
10, 10.1	locking member
11, 11.1	wall
12	surface
13	surface
14	groove
15	flange

Claims

1. Fire fighting agent discharge head comprising a plastic body (2, 2.1)

with means (3) at its first end to connect the head (1, 1.1) to a fire fighting agent bearing installation;
with a central passage (6) extending through the connection means (3) into a discharge section (4) of the body (2, 2.1); and
with a discharge opening (9) connecting the central passage (6) of the discharge section (4) with the outside of the body (2, 2.1), which discharge opening (9) is closed in the surveillance mode of the head (1, 1.1) and which discharge opening (9) is open for the release of fire fighting agent in its fire fighting mode, whereas the cross sectional area of the discharge opening (9) is smaller than the cross sectional area of the central passage (6) extending through the connection means (3),

characterised in that,

the central passage (6) comprises a manifold in its discharge section (4) which manifold comprises a number of discharge openings (9), each discharge opening (9) being closed by a thermal sensitive locking member (10, 10.1) failing upon heat exposure easier than the body (2, 2.1), thereby opening the discharge opening (9) for the release of fire fighting agent, which temperature sensitivity of the locking member (10, 10.1) is designed that it fails at a predetermined temperature.

2. Head according to claim 1, **characterised in that** the manifold is a cavity (8) within the body (2, 2.1) having across sectional area being a multiplicity of the cross sectional area of the central passage (6) in its section extending through the connection means.

3. Head according to claim 2, **characterised in that** the longitudinal axis of the discharge openings (9) are directed into different directions.

4. Head according to one of claims 1 to 3, **characterised in that** the at least one discharge opening (9) is construed to discharge a spray of rather small sized droplets.

5. Head according to one of claims 1 to 4, **characterised in that** the at least one discharge opening (9) has a circular cross sectional geometry.

6. Head according to one of claims 1 to 5, **characterised in that** for the body (2) and the locking members (10) one and the same plastic material is used.

7. Head according to one of claims 1 to 5, **characterised in that** the locking member (10.1) of the at least one discharge opening (9.1) is of plastic material being a different plastic material than the plastic material of the body (2.1) and **in that** the fire sprinkler head (1.1) is manufactured by way of a multi component moulding process, in particular a multi component injecting moulding process.

8. Head according to one of claims 1 to 7, **characterised in that** the body (2) has an outer annular flange (15) facing into the direction of the connecting means (3), which annular flange (15) is a first abutment for a sealing member to sealingly fasten the head (1, 1.1) to a fire fighting agent bearing installation, which sealing member is to cooperate with a second abutment arranged with the complementary connecting means of the fire fighting agent bearing installation, to which the head (1, 1.1) is to be joined.

9. Head according to claim 8, **characterised in that** the sealing member is of a plastic material different to the plastic material of the body and **in that** the head is manufactured by way of a multi component moulding process in particular a multi component injecting moulding process.

10. Head according to one of claims 1 to 9, **characterised in that** the connecting means are provided by a threaded section (3).

11. Head according to claim 10, **characterised in that** the body (2, 2.1) has a tool application section (5), in which a tool to fasten the head (1, 1.1) by way of its threaded section (3) to the fire fighting agent bearing installation may be applied in a torsion tight manner to turn the head (1, 1.1) around the longitudinal axis of its threaded section (3).

12. Head according to claim 11, **characterised in that** the tool application section (5) is arranged between the threaded section (3) and the discharge section (4).

13. Head according to claim 11 or 12, **characterised in that** the threaded section (3) has an air venting groove (14) cutting across the threads of the threaded section (3) starting at the distal end (7) of the threaded section (3) and not extending over all threads.

Patentansprüche

1. Kopf zur Abgabe eines Brandbekämpfungsmittels, umfassend einen Kunststoffkörper (2, 2.1) mit Mitteln (3) an seinem ersten Ende, um den Kopf (1, 1.1) mit einer Brandbekämpfungsmittel enthaltenden Installation zu verbinden; mit einem zentralen Durchgang (6), der sich durch das Verbindungsmittel (3) in einen Abgabeabschnitt (4) des Körpers (2, 2.1) erstreckt; und mit einer Abgabeöffnung (9), die den zentralen Durchgang (6) des Abgabeabschnitts (4) mit der Außenseite des Körpers (2, 2.1) verbindet, welche Abgabeöffnung (9) im Überwachungsmodus des Kopfes (1, 1.1) geschlossen ist und welche Abgabeöffnung (9) in ihrem Brandbekämpfungsmodus zur Abgabe von Brandbekämpfungsmittel geöffnet ist, wobei die Querschnittsfläche der Abgabeöffnung (9) kleiner als die Querschnittsfläche des zentralen Durchgangs (6) ist, der sich durch das Verbindungsmittel (3) erstreckt, **dadurch gekennzeichnet, dass** der zentrale Durchgang (6) in seinem Abgabeabschnitt (4) eine Mannigfaltigkeit umfasst, welche Mannigfaltigkeit eine Anzahl von Abgabeöffnungen (9) umfasst, wobei jede Abgabeöffnung (9) durch ein temperaturempfindliches Sperrelement (10, 10.1) geschlossen ist, welches bei Hitzeeinwirkungen leichter versagt als der Körper (2, 2.1), wodurch es die Abgabeöffnung (9) zur Abgabe von Brandbekämpfungsmittel öffnet, welche Temperaturempfindlichkeit des Sperrelements (10, 10.1) derart ausgelegt ist, dass es bei einer vorbestimmten Temperatur versagt.

2. Kopf nach Anspruch 1, **dadurch gekennzeichnet, dass** die Mannigfaltigkeit ein Hohlraum (8) innerhalb des Körpers (2, 2.1) ist, welcher eine Querschnittsfläche hat, die ein Mehrfaches beträgt von der Querschnittsfläche des zentralen Durchgangs (6) im Abschnitt desselben, der sich durch das Verbindungsmittel erstreckt.

3. Kopf nach Anspruch 2, **dadurch gekennzeichnet, dass** die Längsachsen der Abgabeöffnungen (9) in unterschiedliche Richtungen gerichtet sind.

4. Kopf nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die wenigstens eine Abgabeöffnung (9) dazu ausgelegt ist, einen Sprühregen von eher kleinen Tröpfchen abzugeben.

5. Kopf nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die wenigstens eine Abgabeöffnung (9) eine kreisförmige Querschnittsgeometrie hat.

6. Kopf nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** für den Kopf (2) und die Sperrelemente (10) ein und dasselbe Kunststoffma-

terial verwendet ist.

7. Kopf nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das Sperrelement (10.1) der wenigstens einen Abgabeöffnung (9.1) aus Kunststoffmaterial besteht, das ein anderes Kunststoffmaterial als das Kunststoffmaterial des Körpers (2.1) ist, und dass der Sprinklerkopf (1.1) mittels eines Mehrkomponenten-Gießverfahrens, insbesondere eines Mehrkomponenten-Spritzgießverfahrens, hergestellt ist.

8. Kopf nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** der Körper (2) einen äußeren ringförmigen Flansch (15) aufweist, der in Richtung des Verbindungsmittels (3) weist, welcher ringförmige Flansch (15) ein erster Anschlag für ein Dichtelement ist, um den Kopf (1, 1.1) dichtend an einer Brandbekämpfungsmittel enthaltenden Installation zu befestigen, welches Dichtelement dazu vorgesehen ist, mit einem zweiten Anschlag zusammenzuwirken, welcher zusammen mit dem komplementären Verbindungsmittel der Brandbekämpfungsmittel enthaltenden Installation, mit der der Kopf (1, 1.1) verbunden werden soll, angeordnet ist.

9. Kopf nach Anspruch 8, **dadurch gekennzeichnet, dass** das Dichtelement aus einem Kunststoffmaterial besteht, das sich von dem Kunststoffmaterial des Körpers unterscheidet, und dass der Kopf mittels eines Mehrkomponenten-Gießverfahrens, insbesondere eines Mehrkomponenten-Spritzgießverfahrens, hergestellt ist.

10. Kopf nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** das Verbindungsmittel durch einen Gewindeabschnitt (3) bereitgestellt sind.

11. Kopf nach Anspruch 10, **dadurch gekennzeichnet, dass** der Körper (2, 2.1) einen Werkzeugansatz-Abschnitt (5) aufweist, an dem ein Werkzeug, zum Befestigen des Kopfes (1, 1.1) mittels seines Gewindeabschnitts (3) an der Brandbekämpfungsmittel enthaltenden Installation, torsionsfest angesetzt werden kann, um den Kopf (1, 1.1) um die Längsachse seines Gewindeabschnitts (3) zu drehen.

12. Kopf nach Anspruch 11, **dadurch gekennzeichnet, dass** der Werkzeugansatz-Abschnitt (5) zwischen dem Gewindeabschnitt (3) und dem Abgabeabschnitt (4) angeordnet ist.

13. Kopf nach Anspruch 11 oder 12, **dadurch gekennzeichnet, dass** der Gewindeabschnitt (3) einen Lüftungsschlitz (14) aufweist, der die Gewinde des Gewindeabschnitts (3) durchschneidet, wobei er am distalen Ende (7) des Gewindeabschnitt (3) beginnt und sich nicht über alle Gewinde erstreckt.

Revendications

1. Tête d'évacuation d'agent extincteur comportant un corps en plastique (2, 2.1)
avec des moyens (3) à l'une de ses extrémités pour connecter la tête (1, 1.1) à un support pour un agent extincteur,
avec un passage central (6) s'étendant à travers les moyens de connexion (3) vers une partie d'évacuation (4) à l'extérieur du corps (2,2.1),
avec une ouverture d'évacuation (9) qui est refermée lorsque la tête (1, 1.1) est en mode de surveillance et qui est ouverte pour délivrer l'agent extincteur lorsque ladite tête est en mode de lutte contre le feu, la surface de la section transversale de l'ouverture d'évacuation (9) étant plus petite que la surface de la section transversale du passage central (6) s'étendant au travers des moyens de connexion (3), **caractérisé en ce que**
le passage central (6) comporte un collecteur dans sa partie d'évacuation (4), ledit collecteur comportant une série d'ouvertures d'évacuation (9), chacune des ouvertures d'évacuation (9) étant refermée par une pièce de fermeture sensible à la chaleur (10, 10.1) prévue pour retomber sous l'effet de la chaleur plus facilement que le corps (2, 2.1), provoquant ainsi l'ouverture des ouvertures d'évacuation (9) pour libérer l'agent extincteur, la sensibilité de la pièce de fermeture (10, 10.1) à la température étant définie de manière à provoquer l'ouverture à une température prédéterminée.

2. Tête d'évacuation selon la revendication 1, **caractérisée en ce que** le collecteur est une cavité (8) ménagée à l'intérieur du corps (2, 2.1), comportant une surface de section transversale formée d'une multiplicité de surfaces de section transversale du passage central (6) dans sa section s'étendant à travers les moyens de connexion.

3. Tête d'évacuation selon la revendication 2, **caractérisée en ce que** l'axe longitudinal des ouvertures d'évacuation (9) est orienté dans deux directions différentes.

4. Tête d'évacuation selon l'une des revendications 1 à 3, **caractérisée en ce que** au moins une des ouvertures d'évacuation (9) est conçue pour évacuer une vaporisation de gouttelettes de taille plutôt petite.

5. Tête d'évacuation selon l'une des revendications 1 à 4, **caractérisée en ce que** au moins une des ouvertures d'évacuation (9) comporte une section transversale circulaire.

6. Tête d'évacuation selon l'une des revendications 1 à 5, **caractérisée en ce que** un même et unique matériau plastique est utilisé pour réaliser le corps (2) et l'élément de fermeture (10).

7. Tête d'évacuation selon l'une des revendications 1 à 5, **caractérisée en ce que** l'élément de fermeture (10.1) d'au moins une des ouvertures d'évacuation (9.1) est réalisé dans un matériau plastique différent de celui utilisé pour réaliser le corps (2.1) et **en ce que** la tête de projection au feu (1.1) est réalisée au moyen d'un processus de moulage multi-matériaux, en
particulier un processus de moulage multi-matériaux par injection.

8. Tête d'évacuation selon l'une des revendications 1 à 7 **caractérisée en ce que** le corps (2) comporte une flasque annulaire extérieure (15) faisant face aux moyens de connexion (3), ladite flasque annulaire (15) constituant une première butée pour une pièce de verrouillage pour le verrouillage rapide de la tête (1, 1.1) sur le support de l'agent d'extinction, ledit élément de verrouillage étant prévu pour coopérer avec une deuxième butée disposée avec les moyens de connexion complémentaires du support d'agent extincteur à laquelle la tête (1,1.1) doit être associée.

9. Tête d'évacuation selon la revendication 8, **caractérisée en ce que** l'élément de verrouillage est réalisé dans un matériau plastique différent du matériau plastique utilisé pour la réalisation du corps et **en ce que** la tête est réalisée au moyen d'un processus de moulage multi-composants en particulier un processus de moulage multi-composants par injection.

10. Tête d'évacuation selon l'une des revendications 1 à 9 , **caractérisée en ce que** les moyens de connexion comportent une section (3) filetée.

11. Tête d'évacuation selon la revendication 10, **caractérisée en ce que** le corps (2, 2.1) comporte une partie (5) pour l'application d'un outil, à laquelle un outil prévu pour fixer la tête (1, 1.1) au moyen de sa section filetée (3) sur le support d'agent extincteur peut être utilisée pour effectuer le serrage par torsion de la tête (1, 1.1) autour de l'axe longitudinal de sa section filetée (3).

12. Tête d'évacuation selon la revendication 11, **caractérisée en ce que** la section (5) l'outil de serrage est disposée entre la section filetée (3) et la section d'évacuation (4).

13. Tête d'évacuation selon la revendication 11 ou la revendication 12, **caractérisée en ce que** la section filetée (3) comporte une rainure de ventilation (14) traversant le filetage de la section filetée (3) à partir de l'extrémité distale (7) de la section filetée (3), et ne s'étend pas sur l'ensemble des fils.

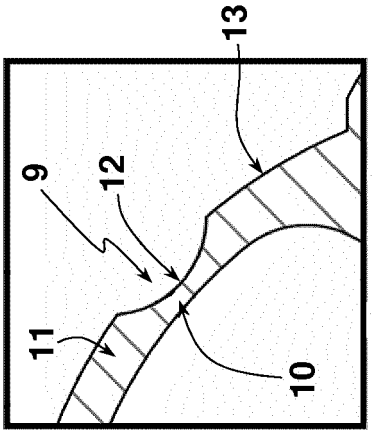


Fig. 3

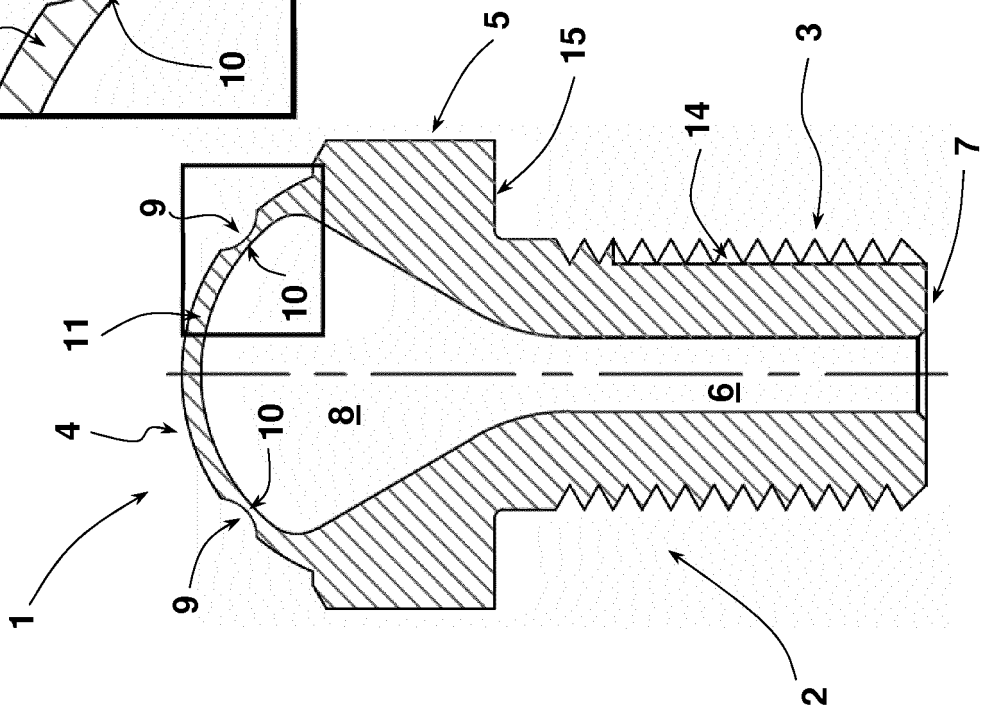


Fig. 2

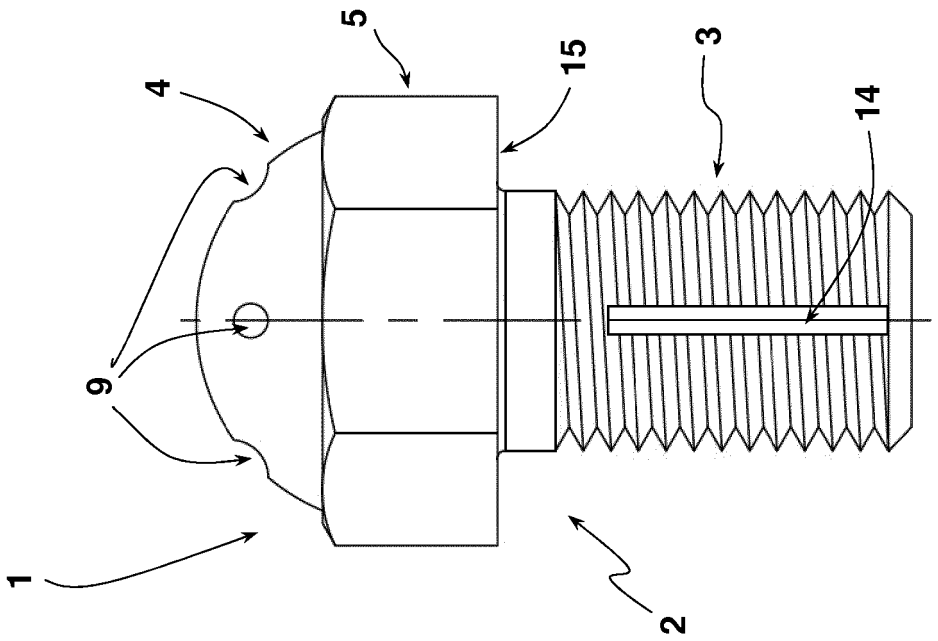


Fig. 1

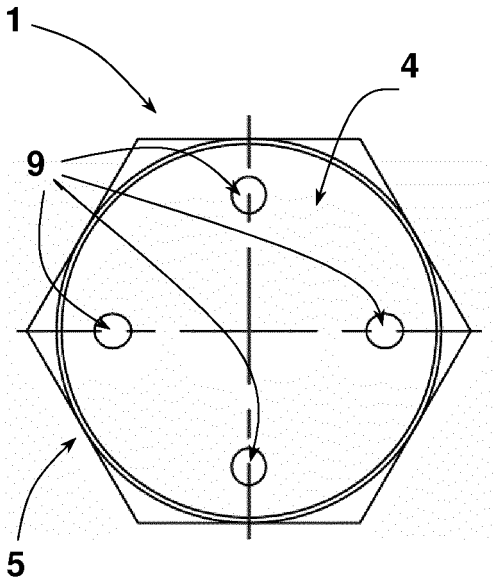


Fig. 4

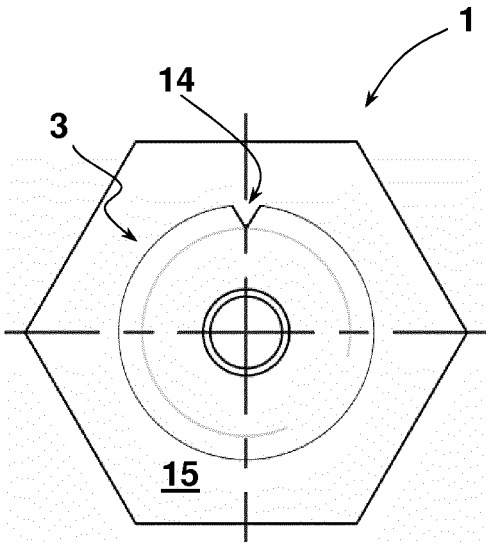


Fig. 5

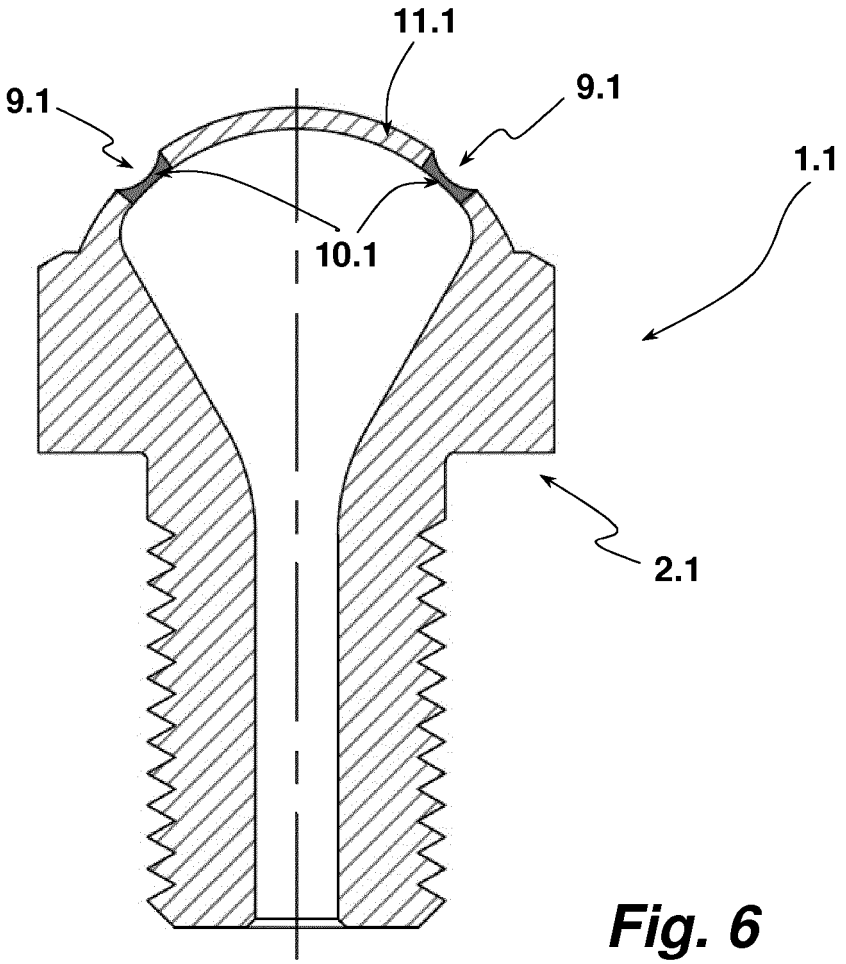


Fig. 6