Claims

1. A fire extinguishing device comprising:

a pressure fire extinguishing agent; and

an accommodating space capable of storing the fire extinguishing agent, wherein a plurality of cut-through ejecting openings are defined in an outer wall of the accommodating space, and the ejecting openings are plugged by plugging pieces made of a pressure-resistant meltable fireproof material.

2. The fire extinguishing device of claim 1, wherein a through hole is defined in the plugging piece, and the through hole is plugged by a granular choke plug made of a meltable flame-retardant plastic material.

3. The fire extinguishing device of claim 1 or 2, wherein the plugging piece is a fusible metal sheet, an edge of the plugging piece is hermetically connected with the edge of the ejecting opening, and the plugging piece is located on an inner surface of the ejecting opening.

4. The fire extinguishing device of claim 1, further comprising:

a control system comprising an early warning device, a pressure valve and a control circuit, wherein the early warning device and the pressure valve are electrically connected with the control circuit respectively; and

a pressure fire extinguishing agent container communicated with the accommodating space through the pressure valve.

5. The fire extinguishing device of claim 4, wherein the plugging piece is strip-shaped, and the early warning device is respectively connected with both ends of the plugging piece through circuits.

6. The fire extinguishing device of claim 4, wherein the early warning device is selected from the group consisting of a temperature sensor, a flame sensor, an infrared spectroscopy flame sensor, an air pressure sensor and combinations thereof.

7. The fire extinguishing device of claim 4, wherein the accommodating space is a pressure-resistant air bag and is made of a flexible fireproof material, and the air bag is connected with the pressure fire extinguishing agent container.

8. The fire extinguishing device of claim 7, wherein an interior of the air bag is divided into multiple air chambers, the air chambers are intercommunicated, walls of the air chambers are made of flexible fireproof materials, and one or more of the ejecting openings correspond to one of the air chambers.

9. The fire extinguishing device of claim 7 or 8, wherein the air bag is provided with a projection and a depression which are set according to actual requirement.

10. A fire extinguishing method using the fire extinguishing device of any of claims 1-9, wherein

the fire extinguishing device is arranged above or on the surrounding of a target,

(1) in a temperature rise process of a local part of the target, the granular choke plug corresponding to the local part starts to melt at first when reaching a warning temperature, and the pressure fire extinguishing agent starts to be ejected from the through hole defined in the plugging piece to the local part of the target for cooling after the granular choke plug melts,

at this time, the pressure in the accommodating space changes to trigger the air pressure sensor to notify the control circuit, and the control circuit alarms on one hand,

when the temperature at the local part of the target rises to a higher level warning temperature, the plugging piece corresponding to the local part starts to melt, the ejecting opening is entirely exposed after the plugging piece melts to eject the pressure fire extinguishing agent to the local part of the target for cooling and fire extinguishment, and

the control circuit commands the pressure valve to open to supplement the pressure fire extinguishing agent in the accommodating space after obtaining the pressure change of the accommodating space through the air pressure sensor, meanwhile, the control circuit carries out high level alarm;

or, (2) in the temperature rise process of the local part of the target, the early warning device detects a danger signal and transmits the danger signal to the control circuit when reaching the warning temperature, the control circuit controls the pressure valve to open to pressurize the air bag so as to force the air bag to unfold, meanwhile, the

control circuit alarms, and

after the air bag unfolds, the ejecting opening closest to the temperature rise position of the local part of the target starts to melt the choke plug or the plugging piece due to the influence of the temperature, so as to directly cool or extinguish the fire in the local area.

Claims

1. A fire extinguishing device comprising:

a pressure fire extinguishing agent; and

an accommodating space capable of storing the fire extinguishing agent, wherein a plurality of cut-through ejecting openings are defined in an outer wall of the accommodating space, the ejecting openings are plugged by plugging pieces made of a pressure-resistant meltable fireproof material, a through hole is defined in the plugging piece, and the through hole is plugged by a granular choke plug made of a meltable flame-retardant plastic material.

2. The fire extinguishing device of claim 1, wherein the plugging piece is a fusible metal sheet, an edge of the plugging piece is hermetically connected with the edge of the ejecting opening, and the plugging piece is located on an inner surface of the ejecting opening.

3. The fire extinguishing device of claim 1, further comprising:

a control system comprising an early warning device, a pressure valve and a control circuit, wherein the early warning device and the pressure valve are electrically connected with the control circuit respectively; and

a pressure fire extinguishing agent container communicated with the accommodating space through the pressure valve.

4. The fire extinguishing device of claim 3, wherein the plugging piece is strip-shaped, and the early warning device is respectively connected with both ends of the plugging piece through circuits.

5. The fire extinguishing device of claim 3, wherein the early warning device is selected from the group consisting of a temperature sensor, a flame sensor, an infrared spectroscopy flame sensor, an air pressure sensor and combinations thereof.

6. The fire extinguishing device of claim 3, wherein the accommodating space is a pressure-resistant air bag and is made of a flexible fireproof material, and the air bag is connected with the pressure fire extinguishing agent container.

7. The fire extinguishing device of claim 6, wherein an interior of the air bag is divided into multiple air chambers, the air chambers are intercommunicated, walls of the air chambers are made of flexible fireproof materials, and one or more of the ejecting openings correspond to one of the air chambers.

8. The fire extinguishing device of claim 7, wherein the air bag is provided with a projection and a depression which are set according to actual requirement.

9. A fire extinguishing method using the fire extinguishing device of claim 1, wherein the fire extinguishing device is arranged above or on the surrounding of a target,

(a) in a temperature rise process of a local part of the target, the granular choke plug corresponding to the local part starts to melt at first when reaching a warning temperature, and the pressure fire extinguishing agent starts to be ejected from the through hole defined in the plugging piece to the local part of the target for cooling after the granular choke plug melts,

at this time, the pressure in the accommodating space changes to trigger the air pressure sensor to notify the control circuit, and the control circuit alarms on one hand,

when the temperature at the local part of the target rises to a higher level warning temperature, the plugging piece corresponding to the local part starts to melt, the ejecting opening is entirely exposed after the plugging piece melts to eject the pressure fire extinguishing agent to the local part of the target for cooling and fire extinguishment, and

the control circuit commands the pressure valve to open to supplement the pressure fire extinguishing agent in the accommodating space after obtaining the pressure change of the accommodating space through the air pressure sensor, meanwhile, the control circuit carries out high level alarm;

or, (b) in the temperature rise process of the local part of the target, the early warning device detects a danger signal and transmits the danger signal to the control circuit when reaching the warning temperature, the control circuit controls the pressure valve to open to pressurize the air bag so as to force the air bag to unfold, meanwhile, the control circuit alarms, and

after the air bag unfolds, the ejecting opening closest to the temperature rise position of the local part of the target starts to melt the choke plug or the plugging piece due to the influence of the temperature, so as to directly cool or extinguish the fire in the local area.