

A FIRE RETARDANT ASSEMBLY

FIELD OF THE INVENTION

- 5 The field of the invention relates to a fire retardant assembly for enclosing a portion of a pipe with a fire retardant layer.

BACKGROUND OF THE INVENTION

- 10 In the infrastructure of buildings, there are pipes housed within the false ceilings to transport fluids such as gas or other flammable substances. These pipes are prone to dangers such as sparks or fires from the ground below or the floor above and the fluids inside the pipes may combust, thereby adding to the damage. The pipes may not be enclosed or lined with fire retardant materials to limit the extent of the damage. Moreover, some building codes and
- 15 standards call for combustible pipes to be enclosed within a fire retardant assembly and some governments have sought to enforce such codes and standards. Attempts to provide such protection have been made in the past but such products are comprise heavy structural components and are complex to assemble together. Therefore, there exists a need to provide a fire retardant assembly to enclose the pipe transporting combustible fluids, and such that the
- 20 components of the fire retardant assembly are easily assembled by users.

SUMMARY OF THE INVENTION

- 25 According to an aspect of the invention, there is provided a fire retardant assembly comprising a container structure and a cover structure. The container structure comprises a duct being shaped for receiving a portion of a pipe within the duct, the portion of the pipe receivable through an opening of the duct. The container structure further comprises a first fire retardant layer disposed on the duct with the duct interposing the first fire retardant layer

and the portion of the pipe received within the duct. The cover structure comprises a lid couplable to the duct for coupling to the opening of the duct for enclosing the portion of the pipe within the duct. The lid is shaped and dimensioned and configurable with the duct to substantially impede passage of fluid through the interface of the lid and the duct. The cover structure further comprises a second fire retardant layer disposed on the lid such that when the lid is coupled to the opening of the duct, the second fire retardant layer is configured with the first fire retardant layer to form a fire retardant layer substantially around the portion of the pipe.

Advantageously, the fire retardant assembly protects the pipe from external fires and substantially limits fires arising from combustion of fluids transported by the pipe from spreading beyond.

Preferably, in the fire retardant assembly, at least one of the first fire retardant layer and the second fire retardant layer is formed from at least one fire retardant board. The material of the fire retardant board provides for fire protection to the first and second fire retardant layers.

Preferably, in the fire retardant assembly, the duct comprises a planar base and a pair of walls extending from and substantially perpendicular the planar base to terminate at a pair of edges, the pair of edges defining the opening of the duct wherethrough the portion of the pipe is receivable.

Preferably, in the fire retardant assembly, the lid comprises a pair of lips extending from a planar base and interspaced for fitting over the pair of edges defined by the pair of walls. Advantageously, the pair of lips fits over the pair of edges to provide a substantial seal between the duct and the lid to impede passage of fluid.

Preferably, in the fire retardant assembly, the pair of lips is wedged between the first fire retardant layer and the pair of walls adjacent the pair of edges when the cover structure

couples to the container structure to substantially impede passage of fluid through the interface of the lid and the duct.

5 Preferably, in the fire retardant assembly, the first fire retardant layer is coupled to the duct and the second fire retardant layer is coupled to the lid.

10 Preferably, the fire retardant assembly further comprises a plurality of spacers disposed within the enclosure, each of the planar base and the pair of walls of the duct having at least one of the plurality of spacers coupled thereto for spatially displacing the portion of the pipe away from the planar base and the pair of walls. Advantageously, the spacers provide for a gap between the portion of the pipe and duct, and protect the pipe from fasteners when the first fire retardant layer is coupled to the duct with fasteners.

15 Preferably, in the fire retardant assembly, at least one of the plurality of spacers is coupled to the lid for spatially displacing the portion of the pipe away from the lid. Advantageously, the spacers provide for a gap between the portion of the pipe and lid, and protect the pipe from fasteners when the second fire retardant layer is coupled to the lid with fasteners. Further, when the lid is secured to a ceiling, the securing means from the ceiling to the lid may damage the pipe in the absence of the spacers.

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Preferably, in the fire retardant assembly, the duct is formed from one of sheet metal and plastic. The use of sheet metal or plastic allows for thinner materials to be used for the duct and provides rigid support to the fire retardant layer enclosing the portion of the pipe.

25 Preferably, in the fire retardant assembly, the lid and the duct form an enclosure extending between two ends, wherein when combustible fluids is transported through the pipe, combustible fluids leaked from the pipe is exhaustible from the enclosure through at least one of the two ends thereof. Advantageously, exhaustion of the leaked combustible fluids away

from the enclosure prevents storage of the combustible fluids within the enclosure, thereby mitigating the risks of accidental combustion.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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Embodiments of the invention will now be described by reference to the accompanying drawings:

FIG. 1 shows a cross-sectional view of the fire retardant assembly.

FIG. 2 shows a perspective view of the fire retardant assembly forming an enclosure
10 extending between two ends.

In the drawing, like parts are denoted by like numerals.

FIG. 1 shows a fire retardant assembly 10 comprising a container structure 12 and a cover structure 14. The container structure comprises a duct 16 which is shaped to receive a portion
15 of a pipe 18 within the duct 16. The portion of the pipe 18 is receivable through an opening 20 of the duct 16. Further, there is a first fire retardant layer 22 disposed on the duct 16, wherein the duct 16 is interposed between the first fire retardant layer 22 and the portion of the pipe 18 which is received within the duct 16. The cover structure 14 comprises a lid 24 which is couplable to the duct 16 and for coupling to the opening 20 of the duct 16. When the lid 24 is
20 coupled to the duct 16, the portion of the pipe 18 is enclosed within the lid 24 and the duct 16. The lid 24 is shaped, dimensioned and configurable with the duct 16 such that when the lid 24 is coupled to the duct 16, the interface 28 between the lid 24 and the duct 16 substantially impedes passage of fluid 26 through the interface 28. For example, the lid 24 may form a frictional fit with the duct 16. Further, the cover structure 14 comprises a second fire retardant
25 layer 30 disposed on the lid 24. When the lid 24 is coupled to the opening 20 of the duct 16, the second fire retardant layer 30 and the first fire retardant layer 22 form a fire retardant layer substantially around the portion of the pipe 18.

The duct 16 may comprise of three sides, one planar base 32 and a pair of walls 34 extending from and substantially perpendicular to the planar base 32. The pair of walls 34 may extend to terminate at a pair of edges 36 which define the opening 20 of the duct 16. As described, the opening 20 of the duct 16 is for receiving the portion of the pipe 18. Further, the lid 24 may
5 comprise of three sides, one planar base 38 and a pair of lips 40 extending from and substantially perpendicular to the planar base 38. The pair of lips 40 may be interspaced for fitting over the pair of edges 36 defined by the pair of walls 34 of the duct 16. For example, the pair of lips 40 may form a frictional fit with the pair of walls 34, thereby forming a substantial seal thereto.

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In forming the frictional fit, the pair of lips 40 may be wedged between the first fire retardant layer 22 and the pair of walls 34 adjacent to the pair of edges 36. The wedging may occur when the cover structure 14 is coupled to the container structure 12, thereby forming a substantial seal between the cover structure 14 and the container structure 12. As such, the
15 wedging of the pair of lips 40 and the pair of walls 34 substantially impedes passage of fluid 26 through the interface 28 between the lid 24 and the duct 16. To further secure the container structure 12 to the cover structure 14, a securing or fastening means may be provided for the pair of lips 40 and the pair of walls 34 in addition to the wedging. For example, the securing or fastening means may be in the form of screws, nails, bolts and nuts, or adhesive.

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In the container structure 12, the first fire retardant layer 22 may be coupled to the duct 16 via securing or fastening means 50. For example, the securing or fastening means 50 may be in the form of screws, nails, bolts and nuts, or adhesive. In some situations, the securing or fastening means 50 such as screws may penetrate through the first fire retardant layer 22 and
25 the duct 16. Worse, the screws may penetrate even further and impact the portion of the pipe 18. As such, the container structure 12 comprises a plurality of spacers 42 disposed within the enclosure 44. For example, the spacers 42 may be disposed between the portion of the pipe 18 and planar base 32 of the duct 16, and between the portion of the pipe 18 and the pair of walls 34. The spacers 42 may be coupled to the planar base 32 and the pair of walls 34 respectively
30 such that the portion of the pipe 18 is spatially displaced away from the planar base 32 and the pair of walls 34. Hence, the securing or fastening means 50 of the first fire retardant layer 22 to the duct 16 will not impact the portion of the pipe 18 due to separation by the spacers 42.

Similarly in the cover structure 14, there second fire retardant layer 30 may be coupled to the lid 24, and/or the cover structure 14 may be coupled to a ceiling. The coupling may comprise securing or fastening means 52 and such means may penetrate the second fire retardant layer 30 and the lid 24. The securing or fastening means 52 such as screws may even penetrate further and impact the portion of the pipe 18. As such, the cover structure 14 comprises the spacers 42 disposed between the portion of the pipe 18 and the lid 24. The spacers 42 may be coupled to the lid 24 such that the portion of the pipe 18 is spatially displaced away from the lid 24. Hence, the securing or fastening means 52 of the second fire retardant layer 30 to the lid 24 will not impact the portion of the pipe 18 due to separation by the spacers 42.

The duct 16 and the lid 24 may be formed from materials such as sheet metal or plastic. For example, the sheet metal may be of a grade of steel or aluminium. The first fire retardant layer 22 and the second fire retardant layer 30 may be formed from at least one fire retardant board, the fire retardant board comprising a fire retardant material. A fire retardant material is defined as one that is designed to resist burning and withstand heat. Typically, such fire retardant materials are rated in terms of number of hours that it can withstand a fire. Some examples of fire retardant materials used in buildings are gypsum and calcium silicate, or any composition therefrom. Other types of fire retardant materials commonly known in the art may also be used. The material for the spacers may be metal or plastic or a fire retardant material as described above.

Referring now to FIG. 2, the figure shows a fire retardant assembly 10 comprising a container structure 12 and a cover structure 14 which form an enclosure 46 extending between two ends 48. The pipe 18 may be supported at intermittent locations along the pipe 18 with harnesses or hangers so as to suspend the pipe 18 within the walls of the fire retardant assembly 10. The pipe 18 may transport fluid 26, which may be combustible. In the event of a leakage of the pipe 18, the fluid 26 may be trapped within the enclosure 46. As such, at least one of the two ends 48 provides exhaustion means to discharge the leaked fluid 26 away from the enclosure 46. The exhaustion means may include the at least one of the two ends 48 of the enclosure 46

being communicable with venting manifolds for exhausting the leaked fluid 26 away from the enclosure 46 so as to ventilate the enclosure 46.

5 While various aspects and embodiments have been disclosed herein, other aspects and embodiments will be apparent to those skilled in the art. The various aspects and embodiments disclosed herein are for purposes of illustration and are not intended to be limiting, within the scope and spirit of the disclosure being indicated by the following claims.

CLAIMS

1. A fire retardant assembly comprising:
5 a fire retardant enclosure extending between two ends forming a duct thereof,
the enclosure being configured to receive a portion of a pipe within the enclosure;
 wherein the received pipe transports combustible fluid and is supported within
the enclosure.
- 10 2. The fire retardant assembly of claim 1, wherein the enclosure is configured to render
the combustible fluid leaked from the pipe becoming exhaustible through at least one
of the two ends.
- 15 3. The fire retardant assembly of claim 1 or 2, wherein the fire retardant enclosure
comprising a first fire retardant layer disposed adjacent to the enclosure.
- 20 4. The fire retardant assembly of claim 1, wherein the enclosure is defined by a base, a
lid and a pair of opposing walls extending from and substantially perpendicular to the
base.
- 25 5. The fire retardant assembly of claim 1 or 2 further comprising a plurality of spacers
disposed within the enclosure to spatially displacing the portion of the pipe away from
the planar base and/or the pair of opposing walls.
- 30 6. The fire retardant assembly of claim 1 or 2, wherein the portion of pipe received is
suspended within the enclosure.
7. The fire retardant assembly of claim 1 or 2, wherein the duct is formed from metal or
plastic.
8. The fire retardant assembly of claim 1 or 2, wherein the enclosure defined by the base,
the lid and the pair of opposing walls substantially impede passage of fluid.
9. A fire retardant assembly comprising:

an enclosure extending between two ends forming a duct thereof, the enclosure being configured to receive a portion of a pipe within the enclosure; and
a first fire retardant layer disposed on the duct,
wherein the received pipe transports combustible fluid and is supported within
5 the enclosure.

10. The fire retardant assembly of claim 9, wherein the enclosure is configured to render the combustible fluid leaked from the pipe becoming exhaustible through at least one of the two ends.

11. The fire retardant assembly of claim 9, wherein the enclosure is defined by a base, a lid and a pair of opposing walls extending from and substantially perpendicular to the base that the defined enclosure substantially impede passage of fluid.

12. The fire retardant assembly of claim 9 further comprising a plurality of spacers disposed within the enclosure to spatially displacing the portion of the pipe away from the planar base and/or the pair of opposing walls.