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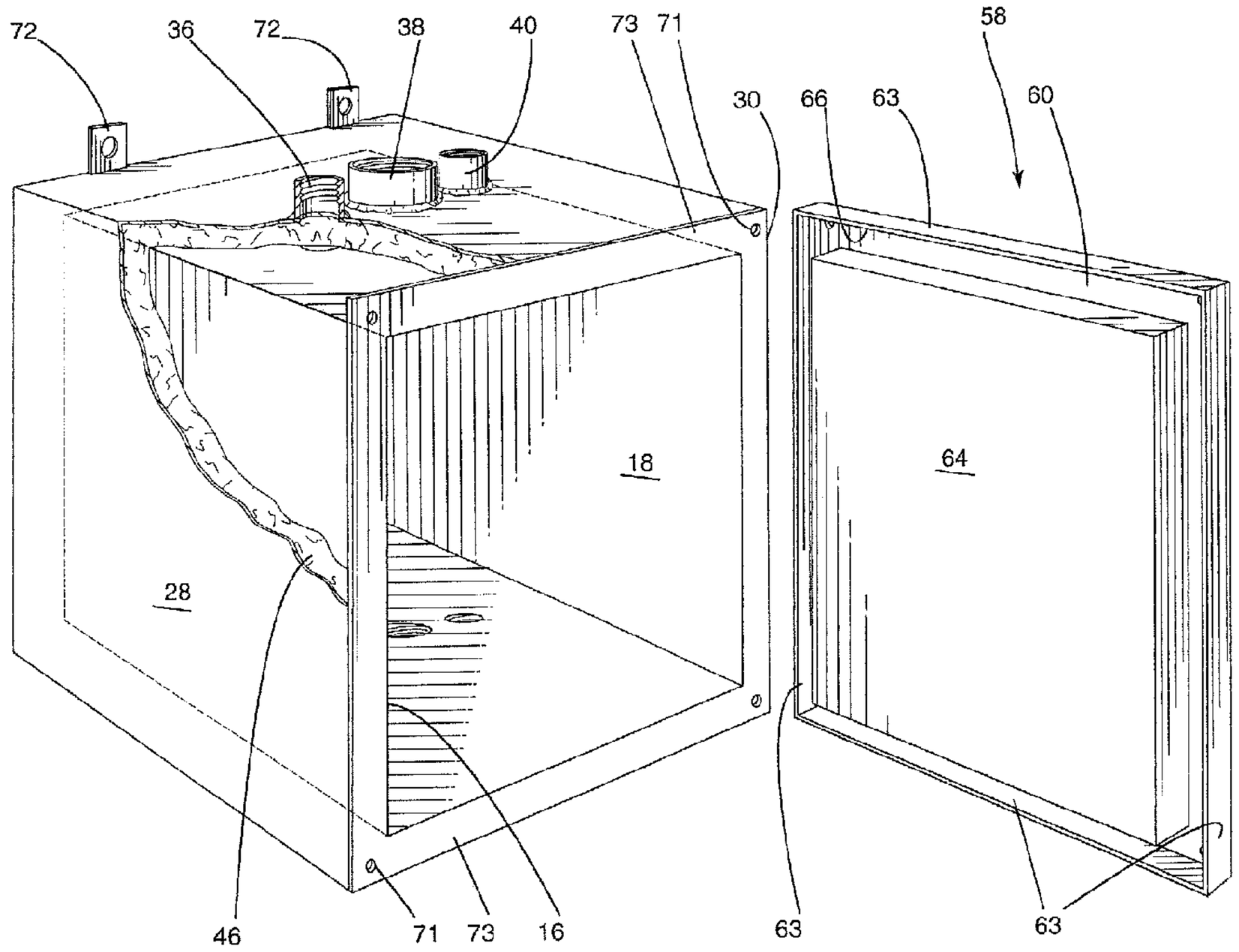
(54) Titre : BOITE ELECTRIQUE RESISTANTE AU FEU
(54) Title: FIRE RESISTANT ELECTRICAL BOX



(57) Abrégé/Abstract:
A fire resistant electrical box which has an inner box formed of a plurality of inner box walls to define an enclosure having an open side and an outer box having a plurality of outer box walls, each of the outer box walls being spaced from a corresponding inner box wall, with an insulating member between each of the outer box walls and corresponding inner box walls. The insulating material its of a ceramic fiber blanket type and there are provided aligned apertures in at least one of the outer box walls and corresponding inner box wall with an electrical wire being capable of being pushed through the ceramic fiber blanket type insulation to provide an intimate fire resistant structure.

ABSTRACT

A fire resistant electrical box which has an inner box formed of a plurality of inner box walls to define an enclosure having an open side and an outer box having a plurality of outer box walls, each of the outer box walls being spaced from a corresponding inner box wall, with an insulating member between each of the outer box walls and corresponding inner box walls. The insulating material is of a ceramic fiber blanket type and there are provided aligned apertures in at least one of the outer box walls and corresponding inner box wall with an electrical wire being capable of being pushed through the ceramic fiber blanket type insulation to provide an intimate fire resistant structure.

FIRE RESISTANT ELECTRICAL BOX

The present invention relates to electrical boxes such as junction boxes and more particularly, to a fire resistant electrical junction box.

BACKGROUND OF THE INVENTION

The use of fire resistant electrical boxes is known in the art. Such boxes are used to impede the passage of fire through a wall from one room to another. Thus, while walls may be made of a fire resistant material, the fire can spread through the space between walls and the fire will gain access to the space through electrical boxes.

A further requirement for fireproof electrical boxes is their use as junction boxes for containing electrical components which are needed for fighting a fire. Thus, sprinkler systems may be electrically actuated and/or power may be supplied to such sprinklers through suitable electrical wires. Naturally, such wires must be as resistant as possible to the heat of a fire.

In the prior art, various approaches have been utilized to provide electrical boxes which have fire resistance. Thus, as shown in U.S. Patent 3,720,783, a cover member is provided for a junction box which forms a tubular collar which can be broken away along a series of lines of weakness in order to form the front of the junction box with the wall surface. U.S. Patent 4,087,624 shows a collar attachment which is adjustable in size.

It is also known to insulate the interior of the housings of the junction boxes and such structures are shown in U.S. Patents 3,646,244; 4,307,813 and 4,413,683. An electrical junction box which is formed of interior and exterior components is shown in U.S. Patent 4,667,840 wherein the junction box is manufactured of a fiberglass material and an interior space being filled with a material such as calcinated gypsum which is

allowed to harden. A hole is then drilled through the interior and exterior boxes to permit access to the interior of the box.

While such structures do provide a certain degree of fire resistance, the steps of drilling through an insulating material does provide for a path for the fire to follow and as well, results in a box which requires a number of steps to manufacture.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a fire resistant electrical box which is highly fire resistant while at the same time is relatively inexpensive to produce and is adaptable for a number of different wires.

According to one aspect of the present invention, there is provided a fire resistant electrical box comprising an inner box having a plurality of inner box walls defining an enclosure having an open side; an outer box having a plurality of outer box walls, each of the outer box walls being spaced from a corresponding inner box wall; an insulating member between each of the outer box walls and corresponding inner box walls; the insulating material being of a ceramic fiber blanket type; and at least one set of aligned apertures in one of the outer box walls and a corresponding inner box wall to receive an electrical wire.

According to a further aspect of the present invention, in a building having electrical wires therein, there is provided the improvement comprising a fire resistant electrical junction box, the fire resistant electrical junction box comprising an inner box having a plurality of inner box walls defining an enclosure having an open side; an outer box having a plurality of outer box walls, each of the outer box walls being spaced from a corresponding inner box wall; a fire resistant insulating member between each of the

outer box walls and corresponding inner box walls; the fire resistant insulating material being of a ceramic fiber blanket type; at least one set of aligned apertures in one of the outer box walls and a corresponding inner box wall; a connecting member mounted about each one of the apertures on the outer box wall; a cover secured to the fire resistant electrical junction box surrounding the open side; and an electrical wire extending through the set of aligned apertures, the electrical wire being in intimate juxtaposition with the insulating material.

In greater detail, the electrical box of the present invention, as set forth above, has an inner box and an outer box. Both are preferably formed of a suitable fire resistant material and in a conventional form of manufacture, may be formed of a suitable steel material. Conventionally, many such boxes are of a rectangular configuration although other configurations such as an octagonal box may equally well be employed. A preferred material would be a 14 gauge steel.

The inner box and outer box are each formed of a plurality of walls with the walls of the outer box being spaced from a corresponding wall of the inner box. Preferably, all walls are equidistantly spaced although other arrangements could be used if desired.

The insulating material is one which permits the passage of a wire therethrough and which material will yield to the pressure of such a wire. Such materials may be of the ceramic fiber blanket type.

In manufacture, the two electrical boxes are formed and then a piece of insulating material, cut to size, is placed on the rear wall of the outer box and the inner box and outer box partially assembled. Insulating pieces are then placed in the side walls to substantially fill the space between the walls.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus generally described the invention, reference will be made to the accompanying drawings illustrating an embodiment thereof, in which:

Figure 1 is a perspective view of a closed electrical box according to an embodiment of the present invention;

Figure 2 is a side sectional view taken along the line 2 - 2 of Figure 1; and

Figure 3 is a perspective view of the electrical box of Figure 1 with the cover off and being shown partially in cutaway.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in greater detail and by reference characters thereto, there is illustrated in Figure 1 an electrical box which is generally designated by reference numeral 10.

Electrical box 10 is comprised of a first inner box generally designated by reference numeral 12 and a second outer box generally designated by numeral 24.

Inner box 12 is of a suitable metallic material, preferably a steel material, and has an inner box back wall 14, an inner box first side wall 16, an inner box second side wall 18, an inner box top wall 20 and an inner box bottom wall 22.

Outer box 24 includes an outer box back wall 26, an outer box first side wall 28, an outer box second side wall 30, an outer box top wall 32 and an outer box bottom wall 34. Each of the outer box walls is spaced substantially equidistantly from a respective inner box wall.

Provided in outer box top wall 32 are a plurality of threaded couplings 36, 38 and 40. Corresponding couplings are provided in outer box bottom wall 34, with only

one such coupling 38' being illustrated in Figure 2. Couplings 36, 38 and 40 may be soldered/welded to outer box top wall 32 as indicated by reference numeral 42.

Mounted intermediate inner box top wall 20 and outer box top wall 32 is a piece of insulation 44. Similarly, insulation piece 46 is provided intermediate inner box first side wall 16 and outer box first side wall 28 and a similar piece of insulation (not shown) is mounted between inner box second side wall 18 and outer box second side wall 30. Insulation piece 50 is also provided intermediate inner box back wall 14 and outer box back wall 26 while a bottom insulation piece 52 is provided intermediate inner box bottom wall 22 and outer box bottom wall 34. Each insulation piece is preferably of the ceramic fiber blanket type which may be manufactured of an alumina-silica-zirconia material. Each piece is independent of the other and inserted between the respective inner and outer walls.

As may be seen in Figure 2, apertures 54 are provided in outer box top wall 32 and outer box bottom wall 34 and which apertures are generally in alignment with the couplings 36, 38 and 40 provided in outer box top wall 32. Similarly, apertures 56 in inner box top and bottom walls 20 and 22 respectively are aligned with apertures 54.

A cover member generally designated by reference numeral 58 includes an outer wall 60 having flanges 63 extending inwardly at all peripheral edges thereof. There is also provided an inner wall 64 spaced from outer wall 60 and containing insulation therein.

Apertures 66 are provided at the corners of outer wall 60 of cover 58 to receive screws 70 which are designed to engage screw holes 71 in flanges 73 which extend inwardly from each of the respective outer walls.

Electrical box 10 may be attached in a conventional manner to a supporting member such as a stud. To this end, there are included brackets 72 which are connected to outer back wall 26.

Interiorly of the box, there may be provided an electrical mounting bar 76 and which is secured to inner box back wall 14 in a known manner.

In use, electrical wire 80 which may be mounted in a suitable conduit 82 screw threadably engaged with connectors 38, 38' is gently pushed through the ceramic fiber blanket type insulation such that the insulation is in intimate contact with the wire. The wire itself is preferably of a fire resistant type and then suitable connections may be made interiorly of the box. Cover 58 is then secured in place.

It will be understood that the above described embodiment is for purposes of illustration only and that changes and modifications may be made thereto without departing from the spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A fire resistant electrical box comprising:

an inner box having a plurality of inner box walls defining an enclosure having an open side;

an outer box having a plurality of outer box walls, each of said outer box walls being spaced from a corresponding inner box wall;

an insulating member between each of said outer box walls and corresponding inner box walls;

said insulating material being of a ceramic fiber blanket type; and

at least one set of aligned apertures in one of said outer box walls and a corresponding inner box wall to receive an electrical wire.

2. The fire resistant electrical box of Claim 1 further including a cover, said cover being sized to enclose said open side, and fastening means for securing said cover to said electrical box.

3. The fire resistant electrical box of Claim 2 wherein there are provided a plurality of sets of aligned apertures in said outer box walls and corresponding inner box walls.

4. The fire resistant electrical box of Claim 1 further including connector means mounted about said apertures of said outer box walls.

5. The fire resistant electrical box of Claim 2 wherein said fastening means comprises a plurality of screws.

6. In a building having electrical wires therein, the improvement comprising a fire resistant electrical junction box, said fire resistant electrical junction box comprising:

an inner box having a plurality of inner box walls defining an enclosure having an open side;

an outer box having a plurality of outer box walls, each of said outer box walls being spaced from a corresponding inner box wall;

a fire resistant insulating member between each of said outer box walls and corresponding inner box walls;

said fire resistant insulating material being of a ceramic fiber blanket type;

at least one set of aligned apertures in one of said outer box walls and a corresponding inner box wall;

a connecting member mounted about each one of said apertures on said outer box wall;

a cover secured to said fire resistant electrical junction box surrounding said open side; and

an electrical wire extending through said set of aligned apertures, said electrical wire being in intimate juxtaposition with said insulating material.

7. The fire resistant electrical junction box of Claim 6 wherein said ceramic fiber blanket type insulating material is of an alumina-silica-zirconia material.

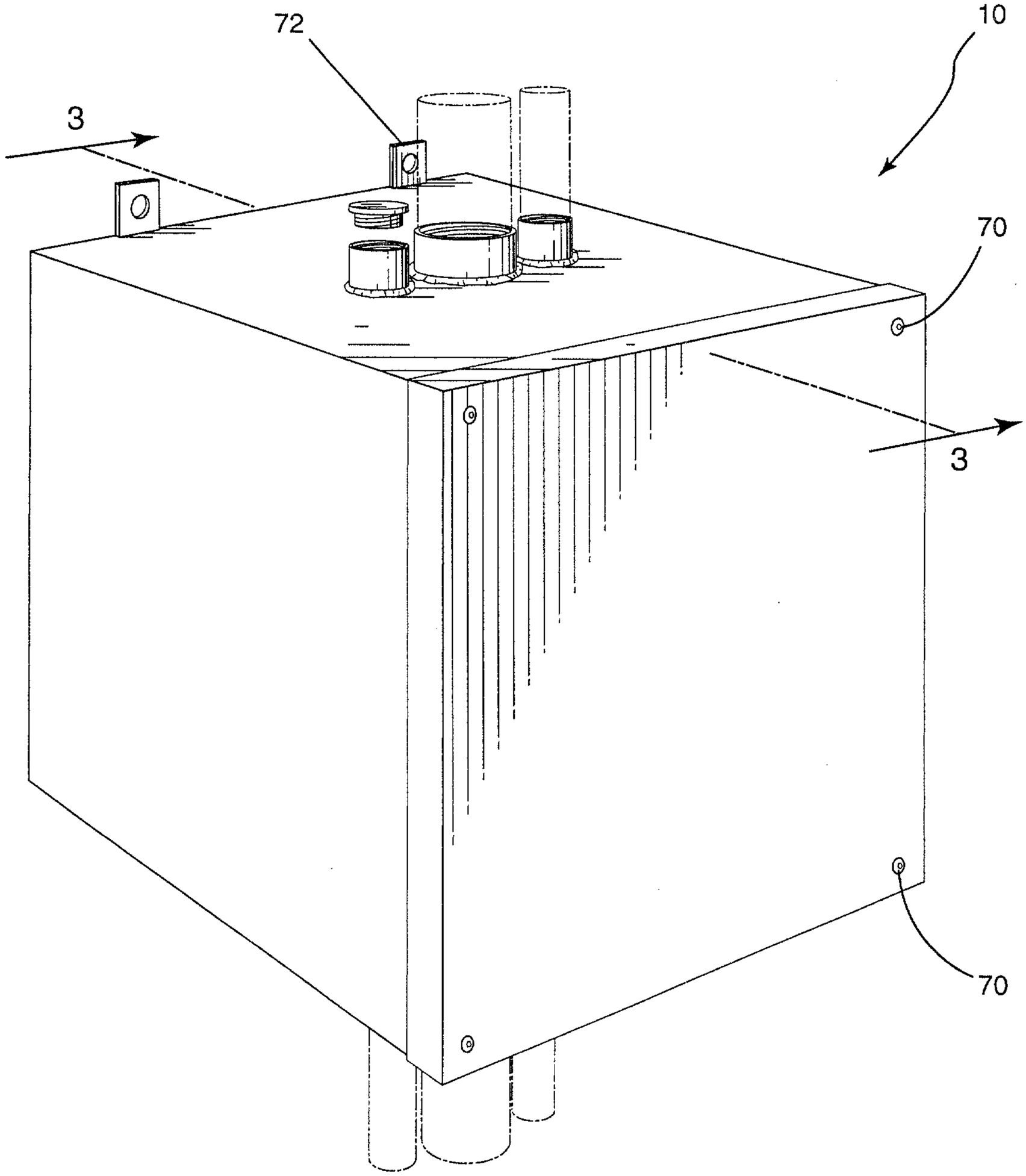


Fig. 1

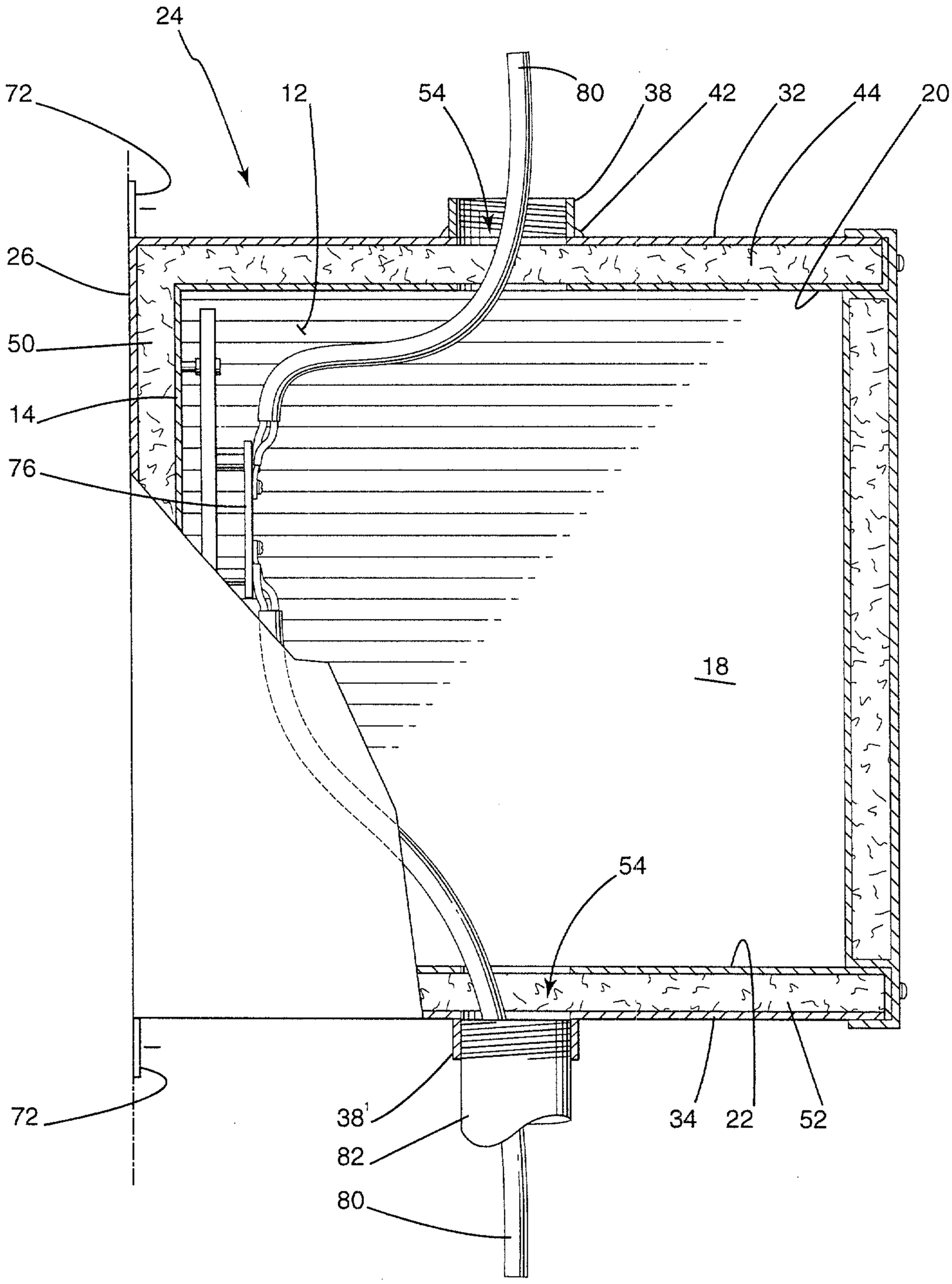


Fig. 2

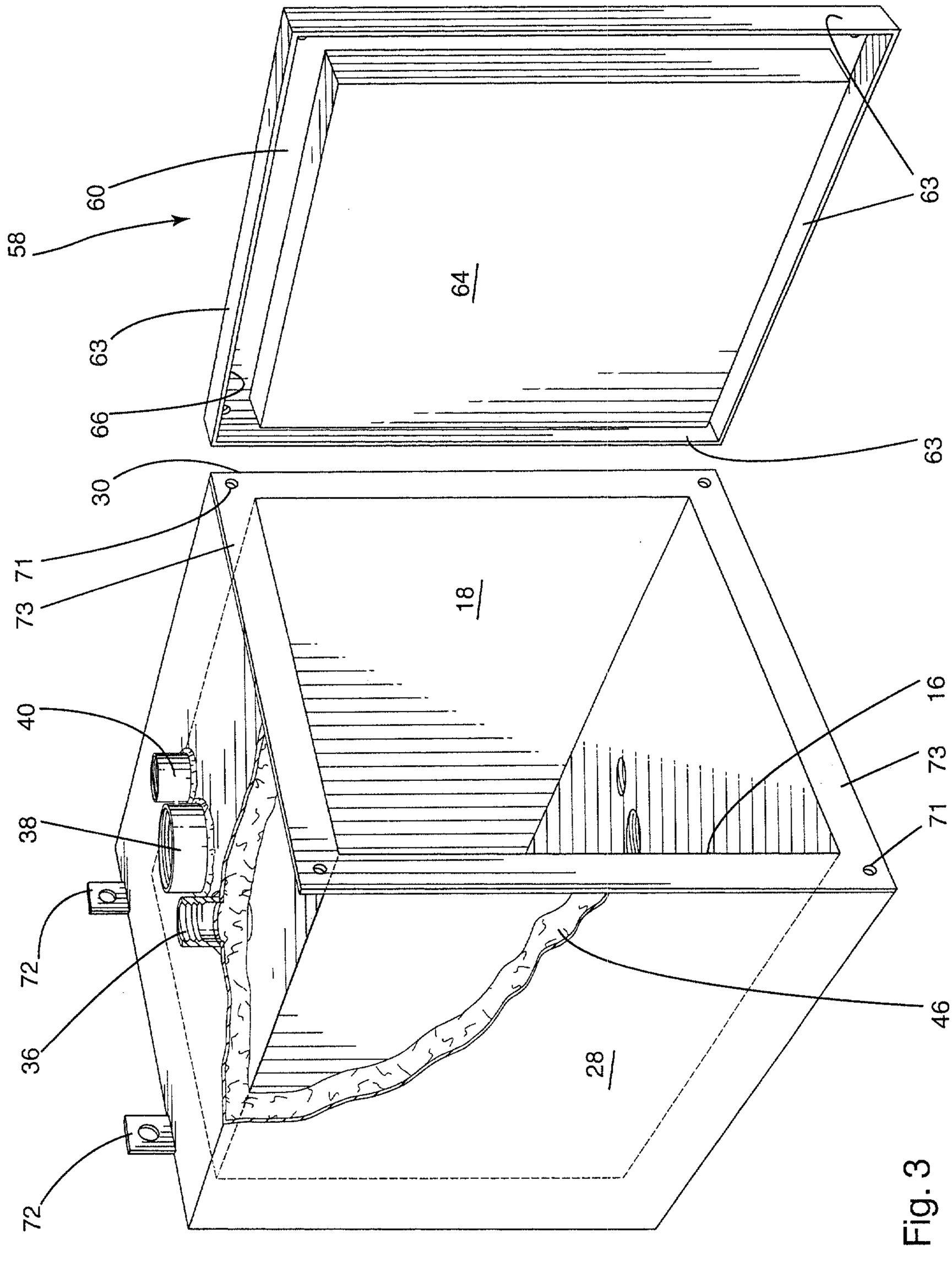
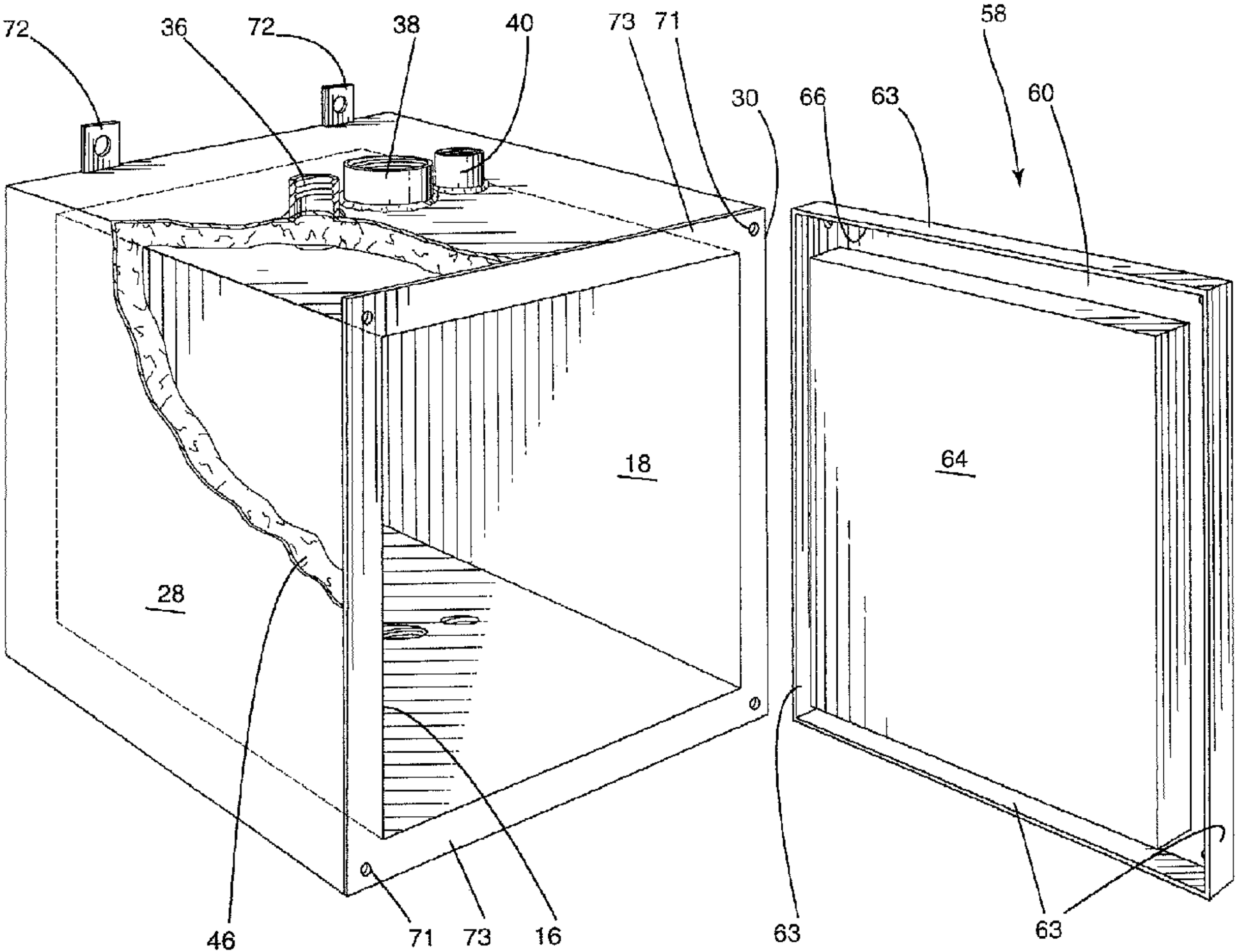


Fig. 3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