

of the secondary sealing wall and insulation failure.

[21] Embodiments of the present invention provide an insulation structure of a panel type membrane storage tank, which can prevent a securing device disposed on an upper surface of a secondary insulation wall from being displaced due to thermal contraction or motion of a hull.

【Technical Solution】

[22] In accordance with one aspect of the present invention, an insulation structure of a membrane type storage tank includes: a secondary insulation wall formed by arranging multiple secondary insulation panels on an inner wall of a hull; a primary insulation wall formed by arranging multiple primary insulation panels on an upper surface of the secondary insulation wall; a secondary sealing wall interposed between the secondary insulation wall and the primary insulation wall; a primary sealing wall disposed on a surface of the primary insulation wall; a transverse connector securing to and supporting the ends of each of the primary and secondary sealing walls, that transmits the loads on the primary and secondary sealing walls to the hull; a securing device disposed on an upper surface of the secondary insulation panel and coupled to the primary insulation panel thereto; and a slit formed on the upper surface of the secondary insulation panel to extend in a transverse direction of the secondary insulation panel, wherein the primary and the secondary insulation panels are provided as a cuboidal-shaped panel in which plywood is bonded to at least one of an upper and a lower surface of polyurethane foam, the secondary sealing wall is formed of a flat Invar membrane without corrugation, the securing device is disposed on a transverse center line of the secondary insulation panel, and the slit includes slits formed in front of and at the rear of the securing device, respectively, with reference to a longitudinal direction of the secondary insulation panel, the slits being spaced apart by the same distance from the securing device.

[23] The securing device may include multiple securing devices, and a pair of slits may be formed in front of and at the rear of each of the securing devices, respectively.

[24] The multiple securing devices may be equidistantly arranged with reference to the longitudinal direction of the secondary insulation panel.

5 [25] The insulation structure may further include: multiple securing portions formed at a vertical edge of the primary insulation panel, including four corners thereof, and coupled to the respective securing devices, wherein the securing portion formed at a corner of the primary insulation panel may be coupled to the securing device disposed at a center of the upper surface of the secondary insulation panel such that the primary insulation panel and the secondary insulation panel are arranged to be offset from each other.

[26] Adjacent primary insulation panels may share the securing device disposed

【CLAIMS】

【Claim 1】

An insulation structure of a membrane type storage tank, comprising:

a secondary insulation wall formed by arranging multiple secondary insulation panels on an inner wall of a hull;

5 a primary insulation wall formed by arranging multiple primary insulation panels on an upper surface of the secondary insulation wall;

a secondary sealing wall interposed between the secondary insulation wall and the primary insulation wall;

10 a primary sealing wall disposed on a surface of the primary insulation wall;
a transverse connector securing to and supporting the ends of each of the primary and secondary sealing walls, that transmits the loads on the primary and secondary sealing walls to the hull;

a securing device disposed on an upper surface of the secondary insulation panel and coupled to the primary insulation panel thereto; and

15 a slit formed on the upper surface of the secondary insulation panel and extending in a transverse direction of the secondary insulation panel,

wherein the primary and the secondary insulation panels are provided as a cuboidal-shaped panel in which plywood is bonded to at least one of an upper and a lower surface of polyurethane foam,

20 the secondary sealing wall is formed of a flat Invar membrane without corrugation,

~~wherein~~ the securing device is disposed on a transverse center line of the secondary insulation panel, and

25 the slit comprises slits formed in front of and at the rear of the securing device, respectively, with reference to a longitudinal direction of the secondary insulation panel, the slits being spaced apart by the same distance from the securing device.

【Claim 2】

The insulation structure according to claim 1, wherein the securing device comprises multiple securing devices and a pair of slits is formed in front of and at the rear of each of the multiple securing devices, respectively.

5 **【Claim 3】**

The insulation structure according to claim 2, wherein the multiple securing devices are equidistantly arranged with reference to the longitudinal direction of the secondary insulation panel.

【Claim 4】

10 The insulation structure according to claim 3, further comprising:
multiple securing portions formed at a vertical edge of the primary insulation panel, including four corners thereof, and coupled to the respective securing devices,
wherein the securing portion formed at a corner of the primary insulation panel is coupled to the securing device disposed at a center of the upper surface of the
15 secondary insulation panel such that the primary insulation panel and the secondary insulation panel are arranged to be offset from each other.

【Claim 5】

The insulation structure according to claim 4, wherein adjacent primary insulation panels share the securing device disposed therebetween such that at least
20 two securing portions are coupled to one securing device.

【Claim 6】

The insulation structure according to claim 4, wherein:
three securing devices are disposed on the upper surface of the secondary insulation panel, one of the three securing devices being disposed at the center of the
25 upper surface of the secondary insulation panel; and
the primary insulation panel has a total of eight securing portions such that

four securing portions are formed at each lateral end of the primary insulation panel, including the corners thereof, with reference to the longitudinal direction of the primary insulation panel, the four securing portions at one lateral end of the primary insulation panel being equidistantly arranged with reference to the longitudinal direction of the primary insulation panel.

~~—[Claim 7]—~~

~~An insulation structure of a membrane type storage tank, comprising:
a secondary insulation wall composed of multiple secondary insulation panels;
a primary insulation wall composed of multiple primary insulation panels and disposed on an upper surface of the secondary insulation wall; and
multiple securing devices disposed on an upper surface of the secondary insulation panel to be coupled to the primary insulation panel;
wherein:
the multiple securing devices are disposed on a transverse center line of the secondary insulation panel to prevent transverse displacement of the securing devices;
and
the multiple securing devices are equidistantly arranged with reference to the longitudinal direction of the secondary insulation panel and a pair of slits is formed in front of and at the rear of each of the securing devices, respectively, to be spaced apart by the same distance from the securing device to prevent longitudinal displacement of the securing devices.~~

~~—[Claim 8]—~~

~~The insulation structure according to claim 7, further comprising:
securing portions formed at a vertical edge of the primary insulation panel, including four corners thereof, and coupled to the respective securing devices such that the primary insulation panel and the secondary insulation panel are arranged to be offset each other.~~