

CLAIMS

1. A sealed and thermally insulating tank intended for storing a fluid, the sealed and thermally insulating tank having an insulating barrier and a sealing barrier disposed on an inner surface of the insulating barrier, the insulating barrier being disposed on a support surface bearing anchoring members and being retained on the support surface by said anchoring members,

wherein the insulating barrier has insulating elements disposed in a plurality of parallel rows,

wherein a said anchoring member has a bearing element (50, 150) that is mounted on the support surface between two insulating elements (30, 130, 230, 1230) of a first of said parallel rows and is movable with respect to the support surface transversely to said first row between:

a retracted position, in which the bearing element (50, 150) is housed entirely between the two insulating elements (30, 130, 230, 1230) so as to leave the location (99) of a second of said parallel rows free, the second row being adjacent to the first row, and

an extended position, in which the bearing element overlaps the location of the second row and is engaged with at least one insulating element (129) of the second row so as to retain said insulating element (29, 129) of the second row on the support surface.

2. The tank as claimed in claim 1, wherein the anchoring member also has a pin (45, 145) that is fixed to the support surface and protrudes inwardly into a space between the two insulating elements (30, 130, 230, 1230) of the first row, and

a nut (47) that is screwed onto the pin and is able to clamp the bearing element (50, 150) in the direction of the support surface in order to lock the position of the bearing element.

3. The tank as claimed in claim 2, wherein the bearing element has a bearing bar (50, 150) having a slot (58, 158) through which the pin (45, 145) passes, such that, when the nut is not clamping the bearing bar, the bearing bar can be slid in a direction transverse to the first row between:

the retracted position, in which the bearing bar (50, 150) is housed entirely between the two insulating elements (30, 130, 230, 1230), and

the extended position(s), in which a portion (51) of the bearing bar protrudes beyond the first row so as to engage with said at least one insulating element (29, 129) of the second row.

4. The tank as claimed in any one of claims 1 to 3, wherein the insulating element of the second row is a flat insulating panel (29, 129) that has a layer of insulating polymer foam sandwiched between a rigid bottom sheet and a rigid cover sheet (25), the rigid cover sheet and the layer of insulating polymer foam having a recess (127) made in the thickness of the insulating panel so as to uncover a bearing zone (28) on the internal surface of the rigid bottom sheet, said recess opening onto an edge (26) of the flat insulating panel parallel to the first row and facing the first row, the anchoring member being engaged with said bearing zone (28) of the bottom sheet.

5. The tank as claimed in claim 4, wherein the flat insulating panel has a rectangular parallelepipedal shape, the recess (127) being made in a corner of the flat insulating panel.

6. The tank as claimed in any one of claims 1 to 5, wherein the support surface bears a plurality of anchoring members (45, 145) that are distributed along the first row of insulating elements and have bearing elements (50, 150) that are mounted on the support surface between the insulating elements (30, 130, 230, 1230) of the first row and are movable with respect to the support surface between the retracted position and the extended position,

said bearing elements engaging with respective zones of said insulating element (29, 129) of the second row in order to retain said insulating element on the support surface.

7. The tank as claimed in any one of claims 1 to 6, wherein the support surface has at least two flat regions that form an angle between one another and meet at an edge-corner zone (10),

wherein the first row of insulating elements has a row of corner structures (30, 130, 230, 1230) disposed along said edge-corner zone of the support surface and the second row of insulating elements has a row of flat insulating panels (29, 129) disposed on a said flat region of the support surface.

8. The tank as claimed in claim 7, wherein a said corner structure (30, 130, 230, 1230) has:

a dihedral insulating block (31, 131, 231) having two faces that are parallel to the two flat regions and form an angle between one another, said face having a flat outer surface bearing against a corresponding flat region of the support surface and a flat inner surface parallel to said corresponding flat region and spaced apart from said flat outer surface in a thickness direction, and

a metal corner piece (32, 232, 65, 1065, 132) fixed to the flat inner surfaces of the dihedral insulating block so as to form said sealing barrier in line with the edge-corner zone of the support surface.

9. The tank as claimed in claim 7, each said corner structure (30, 130, 230, 1230) of the row has a dihedral insulating block (31, 131, 231) having two faces that are parallel to the two flat regions and form an angle between one another, said face having a flat outer surface bearing against a corresponding flat region of the support surface and a flat inner surface parallel to said corresponding flat region and spaced apart from said flat outer surface in a thickness direction, and a metal corner piece (32, 232, 65, 1065, 132) fixed to the flat inner surfaces of the dihedral insulating block so as to form said sealing barrier in line with the edge-corner zone of the support surface,

wherein the metal corner piece has a protruding portion (53, 153, 253) that protrudes with respect to the dihedral insulating block along the direction of the edge-corner zone,

wherein two successive corner structures in said row are disposed so as to exhibit a spacing (38, 138) along the direction of the edge-corner zone between the dihedral insulating blocks, said spacing being at least partially covered by the protruding portion (53, 153, 253) of the metal corner piece of one of the two successive corner structures,

wherein said bearing element of the anchoring member (45, 145) is mounted on the support surface between the dihedral insulating blocks (31, 131, 231) of the two corner structures.

10. The tank as claimed in claim 9, wherein a block of insulating material (39) is disposed in the space (38, 138) between the dihedral insulating blocks between the protruding portion (53, 153, 253) of the metal corner piece and the bearing element.

11. The tank as claimed in claim 9 or 10, wherein one said metal corner piece (1065), the protruding portion (253) of which covers said space, has a drilled hole in its internal surface for receiving a fixing member (88) intended to engage with the dihedral insulating block (1230) in order to fix said metal corner piece to the dihedral insulating block of the corner structures, the fixing member being able to be inserted into the drilled hole from the internal surface of the metal corner piece (1065).

12. The tank as claimed in claim 11, wherein the fixing member (88) has a screw or a rivet, the head of which faces the interior of the tank and the body of which passes through the drilled hole in the metal corner piece in order to engage with the dihedral insulating block.

13. The tank as claimed in claim 12, wherein the dihedral insulating block bears an insert (84) mounted on the flat inner surface of at least one face in order to receive and lock said body of the fixing member in the thickness direction of said at least one face.

14. The tank as claimed in claim 13, wherein the insert (84) is mounted on said flat inner surface with a clearance in a direction parallel to the flat inner surface.

15. The tank as claimed in claim 14, wherein said at least one face of the dihedral insulating block has a groove (83) that extends parallel to the edge-corner zone (10) and opens onto said flat inner surface, the insert (84) being housed in a sliding manner in said groove.

16. The tank as claimed in claim 15, wherein said groove (83) has a width that decreases along the thickness direction toward the flat inner surface, so as to block said insert (84) in the thickness direction.

17. The tank as claimed in any one of claims 11 to 16, wherein the support surface has a third flat region transverse to the edge-corner zone at one end of the edge-corner zone (10), wherein a final corner structure (130) of the row of corner structures has, in addition to said dihedral insulating block, a third face (100) that is parallel to the third flat region and forms angles with said two faces of the dihedral insulating block (130), and

wherein said dihedral insulating block (231) of a penultimate corner structure (230) of the row of corner structures has a larger dimension along the direction of the edge-corner zone than corner structures situated along a central portion of the edge-corner zone, the metal corner piece of said penultimate corner structure being made up of two corner-piece segments (232, 1065) that are juxtaposed along the direction of the edge-corner zone and are fixed to the flat inner surfaces of the dihedral insulating block (231),

wherein a first corner-piece segment (232) of said penultimate corner structure is fixed to said dihedral insulating block (231) by means of a fixing member that is situated on the external surface of the first corner-piece segment and is inaccessible from the internal surface of the first corner-piece segment,

and a second corner-piece segment (1065) of said penultimate corner structure, said second corner-piece segment (1065) being situated on the end side of

the edge-corner zone, has said drilled hole in its internal surface for receiving said fixing member intended to engage with the dihedral insulating block (231) in order to fix said second corner-piece segment (1065) to the dihedral insulating block of the corner structures, the fixing member being able to be inserted into the drilled hole from the internal surface of the second corner-piece segment (1065).

18. The tank as claimed in claim 17, wherein the first corner-piece segment (232) of said penultimate corner structure has orifices (237) for the passage of anchoring members that are used to fix said dihedral insulating block (231) to the support surface and the second corner-piece segment (1065) of said penultimate corner structure situated on the end side of the edge-corner zone has a continuous surface away from the or each drilled hole receiving the or each fixing member.

19. The tank as claimed in any one of claims 1 to 18, wherein said insulating barrier is a primary insulating barrier and said sealing barrier is a primary sealing barrier, the tank also having a secondary insulating barrier (13, 113, 213) having a substantially polyhedral internal surface that is covered with a secondary sealing barrier (15) and forms said support surface.

20. A vessel (70) for transporting a fluid, the vessel having a double hull (72) and a tank (71) as claimed in any one of claims 1 to 19 disposed in the double hull.

21. A system for transferring a fluid, the system having a vessel (70) as claimed in claim 20, insulated pipelines (73, 79, 76, 81) arranged so as to connect the tank (71) installed in the hull of the vessel to a floating or onshore storage installation (77) and a pump for conveying a fluid through the insulated pipelines from or to the floating or onshore storage installation to or from the tank of the vessel.

22. A method for loading or offloading from a vessel (70) as claimed in claim 20, wherein a fluid is passed through insulated pipelines (73, 79, 76, 81) from or to a floating or onshore storage installation (77) to or from the tank (71) of the vessel as claimed in claim 20.

23. A manufacturing method for manufacturing a sealed and thermally insulating tank as claimed in one of claims 1 to 19, the method involving:

providing a support surface,

mounting an anchoring member on the support surface, said anchoring member having a bearing element (50, 150) mounted in a movable manner with respect to the support surface,

mounting the first row of insulating elements (30, 130, 230, 1230) on the support surface such that the bearing element (50, 150) is housed entirely between two insulating elements of the first row of insulating elements and such that said bearing element is mounted so as to be movable transversely to said first row,

disposing a second row of insulating elements (29, 129) on the support surface, the second row being parallel and adjacent to the first row,

moving the bearing element (50, 150) into an extended position, in which the bearing element overlaps the location (99) of the second row and is engaged with at least one insulating element (29, 129) of the second row so as to retain said insulating element of the second row on the support surface, and

locking the bearing element in the extended position.