median portion 6, 7. Each metal strake 1, 2 has two turned-up edges 8, 9 situated along two opposite longitudinal edges of the planar median portion 6, 7. Just one turned-up edge 8, 9 of each of the two metal strakes 1, 2 is depicted in figures 2 to 4. Each turned-up edge 8, 9 projects with respect to the support surface 10.

Figure 2 illustrates the way in which the various elements 1, 2, 3, 4, 5, 6, 7, 8 and 9, namely the two adjacent strakes 1, 2, 6, 7, 8, 9, the two anchoring flanges 3, 4 (fixed together here at the spot of welding 23) and the thermally insulating body 5, are positioned prior to application of the welding method according to the invention.

Figure 3 illustrates the elements specific to said welding method and device according to the invention, in addition to the aforesaid elements of figure 2. Thus, by comparison with figure 2, there are present, in this figure 3, a conducting strip 30 (the expression “conducting band” may also be used to refer to the “conducting strip” 30) and two resistance-seam welding electrode wheels 31, 32, said conducting strip 30~~13~~ and said electrode wheels 31, 32 being connected to electrode-wheel resistance-seam welding equipment not depicted in the attached figures. The conducting strip 30 is positioned in the space defined between the two anchoring flanges 3, 4, more specifically in the space between the anchoring legs 22 of each of the anchoring flanges 3, 4 projecting from the support surface 10. The two electrode wheels 31, 32 are positioned contiguously against the exterior face/side (the face/side that is on the opposite side to the side on which the anchoring flanges are situated) of each of the turned-up edges 8, 9 of the two strakes 1, 2. By applying to the electrode wheels 31, 32, against each of the turned-up edges 8, 9, a pressure directed toward the conducting strip 30, it is possible to cause a current to pass through the thickness consisting of an electrode wheel 31 or 32, a turned-up edge 8 or 9, an anchoring flange 3 or 4 and the conducting strip 30 so as to resistance-seam weld each of the turned-up edges 8, 9 to the contiguous anchoring flange 3, 4.

In the context of the present invention, the choice of the current strength and of the pressure exerted by the electrode wheels is determined, following a great deal of experimentation, in such a way as to ensure optimum electrode-wheel resistance-seam welding. The ranges of current strength and of pressure (for example expressed in bar) are consistent with those set out previously, for defined thicknesses and types of material.

From the point of view of operation of the welding device according to the invention, it is possible to envision a number of configurations regarding the polarity of

CLAIMS

1. A method for welding a membrane of a sealed and thermally insulating tank, in which method a sealed and thermally insulating tank comprises at least one metal sealing membrane and a thermally insulating body comprising at least one thermally insulating barrier (5) adjacent to said membrane, in which method:

- at least two metal strakes (1, 2) of the sealing membrane, which are borne by a support surface (10) of the thermally insulating barrier (5), take the form of a profiled component comprising a planar median portion (6, 7) resting on the support surface (10) and two turned-up lateral edges (8, 9) projecting from the support surface (10), and

- at least two metal welding supports (3, 4), borne by the thermally insulating barrier (5), project from the support surface (10) between the two adjacent turned-up lateral edges (8, 9) of the two adjacent strakes (1, 2),

characterized in that a conducting strip (30) is inserted between the two aforesaid metal welding supports (3, 4) and in that, thereafter, electrode-wheel resistance-seam welding is used to weld together in pairs, in a fluidtight manner, each of the two turned-up lateral edges (8, 9) of the two adjacent metal strakes (1, 2) and a respective one of said metal welding supports (3, 4) which are interposed between said adjacent turned-up edges (8, 9).

2. The method as claimed in claim 1, wherein at least one of the welding supports (3 or 4), and preferably both (3, 4), consists of an anchoring flange so as to anchor the sealing membrane to the thermally insulating barrier (5) of the thermally insulating body.

3. The method as claimed in claim 2, wherein the anchoring flange (3, 4) takes the form of an L and comprises a longitudinal portion (22) and a lower portion (21) engaging with the thermally insulating barrier (5).

4. The method as claimed in claim 3, wherein the lower portion (21) of the anchoring flange (3, 4) extends, parallel to the median portion (6, 7) of the metal strakes (1, 2), in a cavity (13, 14) of the thermally insulating barrier (5) of the thermally insulating body.

5. The method as claimed in any one of the preceding claims, wherein, prior to each of said turned-up edges (8, 9) being welded to one of said welding supports (3, 4), said welding supports (3, 4) have been fixed to one another in a fluidtight manner using welding.

6. The method as claimed in any one of the preceding claims, wherein the electrode-wheel resistance-seam welding of each of said adjacent turned-up edges (8, 9) to the respective one of said welding supports (3, 4) is performed at a speed of between 1.5 meters per minute (m/min) and 2.5 m/min, preferably at a speed of 1.8 m/min.

7. The method as claimed in any one of the preceding claims, wherein the aforesaid turned-up edges (8, 9), and preferably also the welding supports (3, 4), are made of Invar or of a steel containing at least 20% manganese, preferably at least 25% manganese.

8. The method as claimed in claim 7, wherein the thickness of the turned-up edges (8, 9), and preferably also the thickness of the aforesaid welding supports, is between 0.5 and 0.8 millimeters (mm) and preferably equal to 0.7 mm.

9. The method as claimed in claim 8, wherein, during the electrode-wheel resistance-seam welding, the current strength is comprised between 1.8 and 3.2 kiloamperes, preferably comprised between 2.2 and 2.8 kiloamperes, and the pressure force exerted by each electrode wheel (31, 32) against a respective turned-up edge (8, 9) is comprised between 1.2 and 2.8 bar, preferably between 2 and 2.5 bar.

10. The method as claimed in claim 7, wherein the thickness of the turned-up edges (8, 9), and preferably also the thickness of the aforesaid welding supports (3, 4), is comprised between 0.9 and 1.2 millimeters (mm), and preferably equal to 1 mm.

11. The method as claimed in claim 10, wherein, during the electrode-wheel resistance-seam welding, the current strength is comprised between 2.7 and 3.8 kiloamperes, preferably comprised between 3 and 3.5 kiloamperes, and the pressure force

exerted by each electrode wheel (31, 32) against a respective turned-up edge (8, 9) is comprised between 3.5 and 5 bar, preferably between 4 and 4.5 bar.

12. The method as claimed in any one of the preceding claims, wherein, during the electrode-wheel resistance-seam welding, the electrode-wheel resistance-seam welding electric current does not flow continuously; as a preference, said electric current flows for a range of time corresponding to 60% to 80% of the time at a constant frequency.

13. The method as claimed in any one of the preceding claims, wherein the conducting strip (30) is made of a material or of an alloy of materials with a high melting point, higher than the melting point of the turned-up edges (8, 9) and of the welding supports (3, 4).

14. A system for welding a membrane of a sealed and thermally insulating tank, the system comprising an electrode-wheel resistance-seam welding device comprising two electrode wheels (31, 32), a means for holding said electrode wheels (31, 32) against a surface that is to be welded, and a sealed and thermally insulating tank wall comprising:

- two adjacent metal strakes (1, 2) of the sealing membrane, which are borne by a support surface (10) of the thermally insulating barrier (5) of the sealed and thermally insulating tank, taking the form of a profiled component comprising a planar median portion (6, 7) resting on the support surface (10) and two turned-up lateral edges (8, 9) projecting from the support surface (10), and

- two metal welding supports (3, 4), borne by the thermally insulating barrier (5), projecting from the support surface (10) between the two adjacent turned-up lateral edges (8, 9) of the two adjacent strakes (1, 2),

the electrode-wheel resistance-seam welding device making at least one weld between a respective one of said turned-up edges (8, 9) and one of said welding supports (3, 4),

characterized in that the welding device comprises a conducting strip (30) intended to be inserted between the two welding supports (3, 4) so as to weld each of the two aforesaid adjacent turned-up lateral edges (8, 9) to a respective one of said welding supports (3, 4) which are interposed between said adjacent turned-up edges (8, 9).

15. A sealed and thermally insulating tank integrated in a bearing structure, comprising a sealed and thermally insulating tank comprising at least one metal sealing membrane made up of a plurality of metal strakes (1, 2) and a thermally insulating body comprising at least one thermally insulating barrier (5) adjacent to said membrane, in which tank:

- at least two metal strakes (1, 2) of the sealing membrane, which are borne by a support surface (10) of the thermally insulating barrier (5), take the form of a profiled component comprising a planar median portion (6, 7) resting on the support surface (10) and two turned-up lateral edges (8, 9) projecting from the support surface (10), and

- at least two metal welding supports (3, 4), borne by the thermally insulating barrier (5), project from the support surface (10) between the two adjacent turned-up lateral edges (8, 9) of the two adjacent strakes (1, 2),

characterized in that a welding method as claimed in any one of claims 1 to 13 is used to weld together in pairs, in a fluidtight manner, each of the two adjacent turned-up lateral edges (8, 9) of the two adjacent metal strakes (1, 2) and a respective one of said welding supports (3, 4) which are interposed between said adjacent turned-up edges (8, 9) to realize a welding between each of the two adjacent turned-up lateral edges (8, 9) of the two adjacent strakes (1, 2) and a respective one of said welding supports, the said welding having a protrusion lying on a side of the said turned-up lateral edge (8, 9).

16. A ship (70) for transporting a cold liquid product, the ship comprising a double hull (72) and a sealed and thermally insulating tank (71), as claimed in claim 15, placed in the double hull.

17. A transfer system for a fluid, the system comprising a ship (70) as claimed in claim 16, insulated pipes designed to connect the tank (71) installed in the hull of the ship to a floating or on-shore storage facility and a pump for driving a flow of fluid through the insulated pipes from or to the floating or on-shore storage facility to or from the tank of the ship.

18. A method for loading or unloading a ship (70) as claimed in claim 17, wherein a fluid is conveyed through insulated pipes from or to a floating or on-shore storage facility to or from the tank of the ship (71).