

CLAIMS

1. A device for the transfer of cryogenic product from a first floating structure (330) for storing cryogenic product to a second fixed or floating structure for storing cryogenic product, comprising pipes (100) configured to transport the cryogenic product between a duct (300) linked to the first structure and a duct (200) linked to the second structure, said device being characterized in that said pipes (100) are rigid and in that it comprises buoyancy means (400) for carrying the pipes and connection means (600) for fluidically connecting the pipes in pairs, said connection means being suitable for transporting the cryogenic product and allowing at least one degree of freedom.

2. A device according to claim 1, characterized in that said buoyancy means (400) comprise floats linked or articulated to each other (402, 403) or buoys provided with means for anchorage to the bed of an expanse of water.

3. A device according to one of the preceding claims, characterized in that the buoyancy means (400) are linked to the pipes (100) by means of an articulation.

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4. A device according to claim 3, characterized in that the buoyancy means are articulated to the pipes along a vertical axis.

5. A device according to one of the preceding claims, characterized in that each buoyancy means (400) comprises a pipe support (611) enabling pipe sliding and/or comprises a support (612) for pipe fastening to the buoyancy means (400).

6. A device according to one of the preceding claims, characterized in that the buoyancy means number one per pipe, and are arranged parallel thereto, or two per pipe, and are arranged perpendicularly thereto.

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7. A device according to one of the preceding claims, characterized in that at least one of the connection means comprises between two ends of two successive pipes (100), an assembly (630) formed from at least three cryogenic swivel joints and tube elbows connecting them so as to connect the pipes (100) with at least three degrees of rotary freedom.

8. A device according to claim 7, characterized in that the number of cryogenic swivel joints is six to reproduce the six degrees of freedom.

9. A device according to one of the preceding claims, characterized in that at least one of the connection means is a flexible pipe (610) configured to cooperate with a free end of a first rigid pipe (100) and a free end of a second rigid pipe (100), and in that said flexible pipe (610) is configured to transport a cryogenic product.

10. A device according to one of the preceding claims, characterized in that it is configured to be linked to the second structure by mechanical linking means (212), said mechanical linking means (212) comprising one or more levers articulated to the device and to the second structure by means of pivot links or a sliding link.

11. A device according to one of the preceding claims, characterized in that it comprises a flexible pipe (211) configured to transport the cryogenic product and to provide the link between an endmost rigid pipe and the duct linked to the second structure.

12. A device according to one of claims 1 to 11, characterized in that it is configured to be linked to the duct (200) of the second structure by mechanical linking means (212) and fluidic linking means (211).

13. A device according to any one of the preceding claims, characterized in that it comprises a cryogenic interface comprising cryogenic

pipings configured to provide the fluidic link between an endmost pipe and a first structure target duct situated at a higher level.

14. A device according to one of the preceding claims, characterized
5 in that the fluidic connection means and, where provided, the linking means between buoyancy means, are configured to enable a rotation through 180° around a substantially vertical rotational axis to be able to dispose the pipes and buoyancy means parallel to each other, while the buoyancy means are arranged so as not to interfere with that rotation.

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15. A method of retracting a device according to claim 14 comprising at least three fluidic transport units each comprising a buoyancy means (400) bearing a pipe (100), the method comprising the following steps of retracting at least two transport units one onto the other:
- 15 - Folding through a rotation of at least 180° around a rotational axis, of a first transport unit onto a second successive transport unit;
 - Folding through a rotation of at least - 180° around a rotational axis, of said second transport unit onto a third transport unit; and, optionally
 - Rotation of the transport units folded onto each other so as to
 - 20 orientate the assembly so formed in a predetermined direction.