Owing to such stringent requirements for there to be a good seal between active and passive elements of the split valve to prevent product exposure to environment and personnel working in close proximity of the product, manufacture of the elements of the valve are under stringent conditions to ensure that the dimensions of the elements are precisely manufactured to ensure stringent tolerances are met.

In addition, the valve elements are consequently relatively large often owing to the housing for the valve itself being capable of ensuring that there is a good seal between members. This can make the containers bulky and difficult to handle, particularly when being handled in a glove box containment apparatus where the dexterity of operators is compromised.

~~It is an object~~Embodiments of the present invention seek to overcome or alleviate one or more of the problems associated with the prior art.

In accordance with an aspect of the present invention, there is provided a split valve assembly comprising two valve portions complementarily shaped such that the first can sealingly engage with and co-operate with the second to allow the movement of material therethrough, each valve portion comprising a housing, a valve seat and a valve closure member moveable between a first position in which the valve closure member is displaced from the valve seat and the valve is open, and a second position in which the valve closure member co-operates with the valve seat and the valve is closed, wherein the assembly has a first configuration in

which the first and second valve portions engage with one another, the valve closure members being closed, and a second configuration in which the two valve portions are disengaged from one another, the first valve portion having locking means moveable relative to the second valve portion to selectively lock and unlock the two valve portions together.

The present invention provides a valve assembly capable of ensuring a secure and good seal therebetween and which has a simplified mechanism for engagement and securing valve portions together to provide an improved valve system.

The locking means ~~may~~preferably comprises a locking pair, one member of which is moveable relative to the other and capable of selectively engaging with the other member to lock and unlock portions together.

The locking pair ~~may~~preferably comprises a male and female member complementarily shaped to one another. The male member is preferably moveable relative to the female member.

The male member is preferably capable of translational movement.

In one embodiment, the male member comprises a pair and the female member comprises a complementarily shaped blind bore for receiving the male member.

The male member is preferably disposed in the active valve portion and the female in the passive valve portion.

CLAIMS

1. A split valve apparatus comprising two valve portions complementarily shaped such that the first can sealingly engage with and co-operate with the second to allow the movement of material therethrough, each valve portion comprising a housing, a valve seat and a valve closure member moveable between a first position in which the valve closure member is displaced from the valve seat and the valve is open, and a second position in which the valve closure member co-operates with the valve seat and the valve is closed, wherein the apparatus has a first configuration in which the first and second valve portions engage with one another, the valve closure members being closed, and a second configuration in which the two valve portions are disengaged from one another, the first valve portion having locking means moveable relative to the second valve portion to selectively lock and unlock the two valve portions together.

2. A split valve apparatus as claimed in claim 1, wherein the locking means comprises a locking pair one member of which is movable relative to the other and capable of selectively engaging with the other member to lock and unlock portions together.

3. A split valve apparatus as claimed in claim 2, wherein the locking pair comprises a male and female member complementarily shaped to one another.

4. A split valve apparatus as claimed in any one or more of claims 1 to 3, wherein the locking pair comprises a male member which is movable relative to the female member.

5. A split valve apparatus as claimed in any one or more of claims 2 to 4, wherein the locking pair comprises a male member capable of translational movement.

6. A split valve apparatus as claimed in any one or more of claims 2 to 5, wherein the locking pair comprises a male member comprising a pin a female member which comprises a complementarily shaped blind bore, for receiving the male member.

7. A split valve apparatus as claimed in any one or more of claims 2 to 6, wherein the locking pair comprises a male member disposed in the active valve portion and a female in a passive valve portion.

8. A split valve apparatus as claimed in any one or more of claims 2 to 7, wherein the longitudinal axis of the male member is off-set from that of the female member in the locking pair.

9. A split valve apparatus as claimed in any one or more of claims 2 to 8, wherein the first and second valve portions are female members and a third valve portion has corresponding male members, which the female members of the first and second valve portions can receive.

10. A split valve apparatus as claimed in any one or more of the preceding claims, wherein each valve portion is mountable on a vessel or conveyance means.

11. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the valve portions are integrally formed with a vessel or conveyance means.

12. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the inlet and the outlet of the chamber are closed, on movement from the first configuration to the second configuration.

13. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the valve seat and valve closure member are complementarily shaped, to ensure that a seal is formed when the valve closure member is closed.

14. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the apparatus is a split butterfly valve or a split ball valve.

15. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the valve seat comprises a seal member.

16. A split valve apparatus as claimed in claim 15, wherein the seal member comprises an abutement portion and a resiliently deformable portion.

17. A split valve apparatus as claimed in claim 15, wherein the resiliently deformable portion of the seal member is located between the abutement portion and the valve housing.

18. A split valve apparatus as claimed in claim 15, wherein the valve closure member is provided with a recess for receipt of a seal, which is adopted to engage against a solid portion of the valve housing.

19. A split valve apparatus as claimed in claim 18, wherein the valve closure member comprises an elastiometric material covering the valve closure member.

20. A split valve apparatus as claimed in any one or more of the previous claims, wherein the valve comprises biasing means for biasing the valve closure member into its closed position.

21. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the valve seal is located on the valve housing, or on the valve closure member.

22. A split valve apparatus as claimed in any one or more of the preceding claims, wherein the apparatus may be switched from the first configuration to the second during use to allow material be transferred therethrough.

23. A split valve apparatus as claimed in claim 36, wherein on the completion of passing of material, the apparatus may be switched from the second configuration to the first configuration and the two valve portions disengaged.

24. A method of transferring material comprising the use of a split valve apparatus as claimed in any one or more of the previous claims.

CLAIMS

1. A split valve apparatus, comprising:

two valve portions complementarily shaped such that the first valve portion is configured to sealingly engage with and co-operate with the second valve portion to allow movement of material through the engaged valve portions, wherein

each of the two valve portions comprises

a valve housing,

a valve seat, and

a valve closure member moveable between a first position in which the valve closure member is displaced from the valve seat and the valve portion is open, and a second position in which the valve closure member co-operates with the valve seat and the valve portion is closed,

the apparatus is configured to assume a first configuration in which the first and second valve portions engage with one another with the valve closure members being closed, and a second configuration in which the two valve portions are disengaged from one another,

the apparatus comprises a locking pair, with the first valve portion comprising a first locking member that is moveable relative to a second locking member on the second valve portion, the first and second locking members being engageable to selectively lock and unlock the two valve portions together,

the first locking member comprising a male member configured for translational movement, and

the second locking member in the locking pair is a female member that is complementarily shaped to receive the male member.

2. A split valve apparatus as claimed in claim 1, wherein the male member of the locking pair comprises a pin, and the female member comprises a complementarily shaped blind bore for receiving the mate member.

3. A split valve apparatus as claimed in claim 1, wherein the first locking member, in the form of the male member disposed in the first valve portion is selectively engageable with the second locking member, in the form of the female member in the second valve portion.

4. A split valve apparatus as claimed in claim 1, wherein the longitudinal axis of the male member is off-set from the longitudinal axis of the female member.

5. A split valve apparatus as claimed in claim 1, wherein each valve portion is mountable on a vessel or conveyance means.

6. A split valve apparatus as claimed in claim 1, wherein the valve portions are integrally formed with a vessel or conveyance means.

7. A split valve apparatus as claimed in claim 6, wherein movement of the closure members from the first position to the second position closes the vessel or conveyance means.

8. A split valve apparatus as claimed in claim 1, wherein, in each of the two valve portions, the valve seat and the valve closure member are complementarily shaped such that a seal is formed when the valve closure member is closed.

9. A split valve apparatus as claimed in claim 1, wherein the apparatus is a split butterfly valve or a split ball valve.

10. A split valve apparatus as claimed in claim 1, wherein the valve seat comprises a seal member.

11. A split valve apparatus as claimed in claim 10, wherein the seal member comprises an abutment portion and a resiliently deformable portion.

12. A split valve apparatus as claimed in claim 11, wherein the resiliently deformable portion of the seal member is located between the abutment portion and the valve housing.

13. A split valve apparatus as claimed in claim 10, wherein the valve closure member is provided with a recess for receipt of a seal, which is adapted to engage against a solid portion of the valve housing.

14. A split valve apparatus as claimed in claim 13, wherein the valve closure member comprises an elastomeric material covering the valve closure member.

15. A split valve apparatus as claimed in claim 1, wherein the apparatus comprises a biasing element that biases the valve closure members into the closed second position.

16. A split valve apparatus as claimed in claim 10, wherein the seal member is located on the valve housing, or on the valve closure member.

17. A split valve apparatus as claimed in claim 1, wherein the apparatus is configured to switch during use from the second position to the first position to allow material to be transferred through the apparatus.

18. A split valve apparatus as claimed in claim 17, wherein the apparatus is configured to switch, after completion of the passing of material through the apparatus, from the first configuration to the second configuration and the two valve portions disengage.

19. A method of transferring material comprising the use of a split valve apparatus as claimed in claim 1.