However, in Patent Citation 1, the fluid control body installed inside the casing which is fitted onto the fluid pipe is required to have an outer surface of an elaborate shape which is matched with and closely connected to an inner surface of the casing in which the fluid control body is installed. Thus, there is a need for separately designing details of the fluid control body including the lid portions and wall portions having outer surfaces of such an elaborate shape and further including the valve element that opens/closes the opening portion of this partition wall by desired control properties. Therefore, there is a problem that not only a process of manufacturing the fluid control body becomes complicated but also manufacturing cost is increased. In particular, depending on a region where a component building a pipeline such as a pipe and a fluid control body is laid, there are differences in specifications and standards such as pressure, coating, and materials, of a fluid pipe and a fluid control body. When details of the fluid control body are separately designed and manufactured according to the differences, the cost becomes enormous and there is also a problem that storage and maintenance of a specific fluid control body become complicated.

[0006]

Embodiments of the present invention provide a fluid control device with which processes of designing,

manufacturing, and managing a fluid control body are simplified to suppress cost of manufacturing, etc., and desired control properties are provided.

Solution to Problem

[0007]

According to an aspect of the present invention, there is provided a fluid control device including a fluid control body that controls a fluid in a pipe, the fluid control body being installed in a sealed manner inside a casing which is externally fitted onto a fluid pipe in a sealed manner at a point where part of the fluid pipe is cut off in an uninterrupted flow state, wherein the fluid control body includes an assembled on-off valve as a united device by a valve seat body which includes an opening portion and a valve element which is provided in the valve seat body in such a manner that the opening portion is openable and closable, and a partition body which is mounted to the assembled on-off valve by a wall portion that is provided with a through hole communicating with the opening portion, the wall portion being mounted on the valve seat body in a sealed manner, and a lid portion which is provided continuously to the wall portion, the lid portion covering an opening side of the casing, the partition body including a seal component that seals a gap between an inner surface of the casing and the partition body.

According to this aspect of the present invention, as the fluid control body installed in the casing which is

externally fitted onto the fluid pipe in a sealed manner, the on-off valve formed by the valve seat body and the valve element that opens/closes the opening portion, and the partition body formed by the wall portion which is mounted on the valve seat body and the lid portion covering an opening of the casing, the partition body including the seal component that seals the part from the inner surface of this casing are formed separately from each other. Thus, without requiring a fluid control body whose details are designed and manufactured according to a shape of the casing, it is possible to adopt a standardized or commercialized product which is highly versatile as an on-off valve and has desired fluid control properties, and also to hold a sealing property in the casing by the partition body placed between this on-off valve and the inner surface of the casing. The partition body is formed by the wall portion enclosing the opening portion of the valve seat body and the lid portion provided continuously to this wall portion. Thus, structural strength and rigidity of the partition body are enhanced and it is possible to maintain the sealing property against pressure fluctuation and flow rate fluctuation of the fluid in the pipe.

[0008] In an embodiment, the wall portion is formed by a pair of wall members that may be mounted to sandwich the valve seat body in an axis direction of the fluid pipe. According to this embodiment, by

letting the pair of wall portions approach to sandwich the valve seat body of the on-off valve in the pipe axis direction, it is possible to easily mount these wall portions.

[0009]

In an embodiment, the lid portion may be provided continuously to each of the pair of wall members. According to this feature, by letting the pair of wall portions approach to sandwich the valve seat body of the on-off valve in the pipe axial direction, it is possible to easily form as the partition body.

[0010]

In an embodiment, an axial hole through which a neck portion of the fluid control body is inserted may be formed in the lid portion. According to this feature, by the neck portion inserted through to the outside of the casing via the axial hole, it is possible to operate the valve element in the casing to open/close.

[0011]

In an embodiment, the lid portion is mounted around the neck portion in an axial direction of the fluid, and by connecting the lid portion in the axial direction, the axial hole may be formed. According to this embodiment, by letting the pair of lid portions approach to sandwich the neck portion in the axial direction, it is possible not only to easily mount these lid portions but also to align

the pair of lid portions with respect to each other by utilizing the neck portion.

[0012]

In an embodiment, a sealing member that seals the opening portion so as to enclose the opening portion may be disposed between the valve seat body and the wall portion. According to this embodiment, by blocking a flow of the fluid between the valve seat body and the wall portion by the sealing member enclosing the opening portion and by installing the fluid control body in the casing, it is possible to prevent corrosion in an outside region excluding an inside region formed as a flow passage.

BRIEF DESCRIPTION OF DRAWINGS

[0013]

FIG. 1 is a front view showing a state where a process valve and a cutting machine are attached to a casing in a first embodiment of the present invention.

FIG. 2 is a side view showing a state where an inserting machine including a fluid control body is attached to the casing.

FIG. 3 is a partly-sectional front view showing a state where the fluid control body in the first embodiment is installed in the casing.

FIG. 4 is a partly-sectional side view as well as FIG. 3.

CLAIMS

1. A fluid control device comprising a fluid control body that controls a fluid in a pipe, the fluid control body being installed in a sealed manner inside a casing which is externally fitted onto a fluid pipe in a sealed manner at a point where part of the fluid pipe is cut off in an uninterrupted flow state, wherein

the fluid control body includes

an assembled on-off valve as a united device by a valve seat body which includes an opening portion and a valve element which is provided in the valve seat body in such a manner that the opening portion is openable and closable, and

a partition body which is mounted to the assembled on-off valve by

a wall portion that is provided with a through hole communicating with the opening portion, the wall portion being mounted on the valve seat body in a sealed manner, and

a lid portion which is provided continuously to the wall portion, the lid portion covering an opening side of the casing,

the partition body including a seal component that seals a gap between an inner surface of the casing and the partition body.

2. The fluid control device according to claim 1, wherein the wall portion is formed by a pair of wall members that is mounted to sandwich the valve seat body in an axial direction of the fluid pipe.

3. The fluid control device according to claim 2, wherein the lid portion is provided continuously to each of the pair of wall members.

4. The fluid control device according to any one of claims 1 to 3, wherein

an axial hole through which a neck portion of the fluid control body is inserted is formed in the lid portion.

5. The fluid control device according to claim 4, wherein the lid portion is mounted around the neck portion in an axial direction of the fluid pipe, and wherein

by connecting the lid portion in the axial direction, the axial hole is formed.

6. The fluid control device according to any one of claims 1 to 5, wherein

a sealing member that seals the opening portion so as to enclose the opening portion is disposed between the valve seat body and the wall portion.