CLAIMS

1. A cell trapping device configured to trap cells in a test liquid comprising:

a housing including a lid member having an introduction channel configured to introduce a test liquid into an inside and a storage member having a discharge channel configured to discharge the test liquid to an outside;

a filter having a filter region in which a through-hole configured to pass the test liquid is formed in a thickness direction, provided on a channel between the introduction channel and the discharge channel in the housing, and supported between the lid member and the storage member by the lid member and the storage member; and

a plurality of fastening members configured to clamp the lid member and the storage member from both sides in an intersecting direction that is a direction intersecting with the filter to fasten the lid member and the storage member to each other, wherein

the fastening members are located along a peripheral edge part of the housing so as to surround the filter, and wherein

at least one of the lid member and the storage member includes guide parts extending along an outer edge of a surface at a peripheral edge part of the surface to be an outer surface in the intersecting directions at the time of assembly,

the fastening members include claws protruding from a surface facing to the surface including the guide parts, and

the fastening members are configured to be slidable along the guide parts by engaging the claws with the guide parts.

2. The cell trapping device according to claim 1, wherein the guide parts are protrusions.

3. The cell trapping device according to claim 1, wherein the guide parts are grooves.

4. The cell trapping device according to any one of claims 1 to 3, further comprising

a supporting member configured to support the filter between the lid member and the storage member, wherein the lid member or the storage member has a groove having a depth in the intersecting direction at a position of an outer side from the filter region at the time of assembly,

the supporting member has a shape that allows the supporting member to be accommodated in the groove, and

the supporting member accommodated in the lid member or the storage member supports the filter by pressing the filter to the groove side of the lid member or the storage member at an outer circumference side from the filter region.

5. The cell trapping device according to any one of claims 1 to 4, wherein

the lid member includes:

a first protrusion part provided at a position outward from the filter

region and inward from an outer edge of the filter at the time of assembly and to protrude outward from a surface of a side to which the filter is attached; and

a first fitting part provided at a position outward away from the first protrusion part and a position where at least a part of the filter is overlapped at the time of assembly and configured to fit with the storage member,

the storage member includes:

a second protrusion part provided at a position corresponding to the first protrusion part at the time of assembly and located at a position corresponding to the first protrusion part to protrude; and

a second fitting part configured to fit with the lid part at the time of assembly,

one of the first fitting part and the second fitting part has a convex shape and the other has a concave shape, and

the channel is formed inside the housing by locating the first protrusion part and the second protrusion part at a corresponding position sandwiching the filter and the filter is fastened by fitting the first fitting part and the second fitting part at an outer circumference side from the filter region is preferable.

6. The cell trapping device according to claim 5, further comprising a sealing member configured to be sandwiched between the filter and at least one of the first protrusion part and the second protrusion part and to have elasticity, wherein

the sealing member is located at all regions corresponding to the first protrusion part and the second protrusion part in a state of sandwiching the filter.

7. The cell trapping device according to any one of claims 1 to 6, wherein an outer surface of the storage member protrudes in the intersecting direction, compared with an edge part of the storage member side of the fastening members.

8. The cell trapping device according to any one of claims 1 to 7, wherein an outer surface of the lid member protrudes in the intersecting direction, compared with an edge part of the lid member side of the fastening members.

9. The cell trapping device according to any one of claims 1 to 8, wherein a length of the fastening members in the intersecting direction is equal to or less than the thickness of the housing.

10. The cell trapping device according to any one of claims 1 to 9, wherein

the filter in the cell trapping device has a plurality of alignment holes at positions outward from the filter region and inward from an outer edge of the filter, and

at least one of the lid member and the storage member has hole parts provided at positions corresponding to the alignment holes.

11. The cell trapping device according to any one of claims 1 to 10, wherein

the test liquid is blood, and

the trapped cells are circulating tumor cells.

12. A cell trapping system comprising:

the cell trapping device according to any one of claims 1 to 11;

test liquid supplying means for supplying the test liquid to the introduction channel of the cell trapping device;

treatment liquid supplying means for supplying the treatment liquid for treating the cells trapped in the filter to the introduction channel of the cell trapping device by passing the treatment liquid through the filter; and

selecting means for selecting the liquid to supply to the cell trapping device from the test liquid and the treatment liquid.

13. A method for producing a cell trapping device, the cell trapping device comprising:

a housing having a lid member having an introduction channel configured to introduce a test liquid into an inside and a storage member having a discharge channel configured to discharge the test liquid to an outside;

a filter having a filter region in which a through-hole configured to pass the test liquid is formed in a thickness direction, provided on a channel between the introduction channel and the discharge channel in the housing, and supported between the lid member and the storage member by the lid member and the storage member; and

a plurality of fastening members configured to clamp the lid member and the storage member from both sides in an intersecting direction that is a direction intersecting with the filter to fasten the lid member and the storage member to each other,

the method comprising:

overlapping the storage member, the filter, and the lid member; and

clamping the peripheral part of the housing by the fastening members so as to surround the filter whereby

at least one of the lid member and the storage member includes guide parts extending along an outer edge of a surface at a peripheral edge part of the surface to be an outer surface in the intersecting directions at the time of assembly,

the fastening members include claws protruding from a surface facing to the surface including the guide parts, and

the fastening members are configured to be slidable along the guide parts by engaging the claws with the guide parts.

14. The method for producing a cell trapping device according to claim 13, wherein

the filter having a plurality of alignment holes at positions outward from the filter region and inward from an outer edge of the filter,

at least one of the lid member and the storage member having hole parts provided at positions corresponding to the alignment holes, and

the method comprises aligning the lid member or the storage member and the filter by inserting stick-like jigs whose edge parts are inserted into the hole parts through the alignment holes at the time of overlapping the filter with the lid member or the storage member.