CLAIMS

[Claim 1]

A sample processing device comprising:

a sample holding part;

a reagent holding part;

a reaction part;

a flow path for connecting the sample holding part, the reagent holding part, and the reaction part;

a plurality of cylinders; and

a plurality of plungers respectively installed to be capable of reciprocating in the plurality of cylinders, wherein

the plurality of cylinders have a configuration that allows fluid to circulate through each other via the flow path,

the cylinder is sealed by the plunger, and

at least a part of the plunger is disposed below a sealing film that seals an upper end side of the cylinder.

[Claim 2]

The sample processing device according to claim 1, wherein

the plunger has a projected part or a recessed part at a part

positioned outside the cylinder, and is driven by a plunger drive mechanism coupled via the projected part or the recessed part.

[Claim 3]

The sample processing device according to claim 2, wherein

the plunger is longer than a depth of the cylinder.

[Claim 4]

A sample processing apparatus comprising:

the sample processing device according to claim 1;

a drive part;

a measuring part; and

a stage on which the sample processing device is installable, wherein

the drive part has a plunger drive mechanism, and

the plunger drive mechanism reciprocates the plurality of plungers.

[Claim 5]

The sample processing apparatus according to claim 4, wherein

the plunger drive mechanism is coupled with the sample processing device on the outside of the cylinder.

[Claim 6]

The sample processing apparatus according to claim 4, wherein

the fluid moved to the reaction part is sealed by plungers on upstream and downstream sides of the reaction part among the plurality of plungers.

[Claim 7]

The sample processing apparatus according to claim 4, further comprising:

a temperature adjusting part, wherein

the temperature adjusting part adjusts, by heating or cooling, a temperature of at least one of the sample holding part, the reagent holding part, and the reaction part of the sample processing device installed on the stage.

[Claim 8]

The sample processing apparatus according to claim 4, wherein

the measuring part has a configuration capable of optical measurement.

[Claim 9]

The sample processing apparatus according to claim 4, wherein

the measuring part includes an electrophoresis part.

[Claim 10]

The sample processing apparatus according to claim 4, wherein

the plunger drive mechanism allows the fluid to circulate by reciprocating the plunger on the upstream side and the plunger on the downstream side included in the plurality of plungers.

[Claim 11]

The sample processing apparatus according to claim 4, wherein

the drive part has a reagent introduction mechanism, and

the reagent introduction mechanism is lowered to crush the reagent holding part.

[Claim 12]

A sample processing method which is a method for processing a sample using the sample processing apparatus according to claim 4, the method comprising:

a reagent introduction step of introducing a reagent into a predetermined position;

a sample flow step of flowing the sample in the sample holding part into a predetermined position;

a reaction step of allowing the reagent to react with a substance to be processed contained in the sample at a predetermined position; and

an analysis step of analyzing the fluid, wherein

the sample flow step is performed by reciprocating the plunger.

[Claim 13]

The sample processing method according to claim 12, wherein

the sample processing apparatus further includes a temperature adjusting part, and

the temperature adjusting part adjusts, by heating or cooling, a temperature of at least one of the sample holding part, the reagent holding part, and the reaction part of the sample processing device installed on the stage.

[Claim 14]

The sample processing method according to claim 12, wherein

the measuring part has a configuration capable of optical

measurement, and

the analysis step is to perform the optical measurement.

[Claim 15]

The sample processing method according to claim 12, wherein

the measuring part includes an electrophoresis part, and the analysis step is performed by the electrophoresis part.

[Claim 16]

The sample processing method according to claim 12, wherein

the plunger drive mechanism allows the fluid to circulate by reciprocating the plunger on the upstream side and the plunger on the downstream side included in the plurality of plungers.

[Claim 17]

The sample processing method according to claim 12, wherein

the drive part has a reagent introduction mechanism, and

the reagent introduction step includes a step in which the reagent introduction mechanism is lowered to crush the reagent holding part.