# CLAIMS

1. A substrate processing apparatus for processing a substrate by supplying a fluid to the substrate, the substrate processing apparatus comprising:

measurement flow passage portions as part of a respective plurality of supply paths of fluids to be supplied to the substrate, the measurement flow passage portions constituting measurement regions for measurement of foreign matter in the fluids, and being disposed so as to form a row with each other;

a light irradiating unit configured to form an optical path in one of the flow passage portions, the light irradiating unit being shared by the plurality of flow passage portions;

a moving mechanism configured to move the light irradiating unit relatively along a direction of arrangement of the flow passage portions to form the optical path within the flow passage portion selected among the plurality of flow passage portions;

a light receiving unit including a light receiving element, the light receiving element receiving light transmitted by the flow passage portion; and

a detecting unit configured to detect foreign matter in the fluid on a basis of a signal output from the light receiving element, wherein

fluids having indexes of refraction different from each other flow through one flow passage portion and another flow passage portion among the plurality of flow passage portions, and

a lens displacing mechanism is provided, the lens displacing mechanism displacing a condensing lens included in a light irradiating optical system and a light receiving lens included in a light receiving optical system in a direction of the optical path according to the indexes of refraction of the fluids.

2. The substrate processing apparatus according to claim 1, wherein

the light irradiating unit and the light receiving unit include the light irradiating optical system and the light receiving optical system, respectively,

the light irradiating optical system and the light receiving optical system are shared by the plurality of flow passage portions, and

the moving mechanism is configured to move the light irradiating optical system and the light receiving optical system relatively along the direction of arrangement of the flow passage portions.

3. The substrate processing apparatus according to claim 1, wherein

a test flow passage portion as a part of a flow passage of a test fluid including test particles at a preset ratio, the test flow passage portion constituting a measurement region for measurement of the test particles in the test fluid, is provided at a position along the direction of arrangement of the measurement flow passage portions,

the light irradiating unit selects one of the measurement flow passage portions and the test flow passage portion, and forms the optical path, and

the detecting unit detects the foreign matter in the fluid in the measurement flow passage portion on the basis of a signal output from the light receiving element when the light irradiating unit forms the optical path in the test flow passage portion.

4. A substrate processing apparatus for processing a substrate by supplying a fluid to the substrate, the substrate processing apparatus comprising:

measurement flow passage portions as part of a respective plurality of supply paths of fluids to be supplied to the substrate, the measurement flow passage portions constituting measurement regions for measurement of foreign matter in the fluids, and being disposed so as to form a row with each other;

a light irradiating unit configured to form an optical path in one of the flow passage portions, the light irradiating unit being shared by the plurality of flow passage portions;

a moving mechanism configured to move the light irradiating unit relatively along a direction of arrangement of the flow passage portions to form the optical path within the flow passage portion selected among the plurality of flow passage portions;

a light receiving unit including a light receiving element, the light receiving element receiving light transmitted by the flow passage portion; and

a detecting unit configured to detect foreign matter in the fluid on a basis of a signal output from the light receiving element, wherein

fluids having indexes of refraction different from each other flow through one flow passage portion and another flow passage portion among the plurality of flow passage portions,

the light irradiating unit includes a plurality of condensing lenses having focal lengths different from each other according to the indexes of refraction of the fluids, and

the light receiving unit includes a plurality of light receiving lenses having focal lengths different from each other according to the indexes of refraction of the fluids.

5. The substrate processing apparatus according to claim 4, wherein

the light irradiating unit and the light receiving unit include a light irradiating optical system and a light receiving optical system, respectively,

the light irradiating optical system and the light receiving optical system are shared by the plurality of flow passage portions, and

the moving mechanism is configured to move the light irradiating optical system and the light receiving optical system relatively along the direction of arrangement of the flow passage portions.

6. The substrate processing apparatus according to claim 4, wherein

a test flow passage portion as a part of a flow passage of a test fluid including test particles at a preset ratio, the test flow passage portion constituting a measurement region for measurement of the test particles in the test fluid, is provided at a position along the direction of arrangement of the measurement flow passage portions,

the light irradiating unit selects one of the measurement flow passage portions and the test flow passage portion, and forms the optical path, and

the detecting unit detects the foreign matter in the fluid in the measurement flow passage portion on the basis of a signal output from the light receiving element when the light irradiating unit forms the optical path in the test flow passage portion.

7. A substrate processing apparatus for processing a substrate by supplying a fluid to the substrate, the substrate processing apparatus comprising:

measurement flow passage portions as part of a respective plurality of supply paths of fluids to be supplied to the substrate, the measurement flow passage portions constituting measurement regions for measurement of foreign matter in the fluids, and being disposed so as to form a row with each other;

a light irradiating unit configured to form an optical path in one of the flow passage portions, the light irradiating unit being shared by the plurality of flow passage portions;

a moving mechanism configured to move the light irradiating unit relatively along a direction of arrangement of the flow passage portions to form the optical path within the flow passage portion selected among the plurality of flow passage portions;

a light receiving unit including a light receiving element, the light receiving element receiving light transmitted by the flow passage portion;

a detecting unit configured to detect foreign matter in the fluid on a basis of a signal output from the light receiving element;

a plurality of groups each including the plurality of flow passage portions, the light irradiating unit, the moving mechanism, and the light receiving unit;

a light source common to the groups; and

a split light path forming unit configured to form an optical path branching on a downstream side to split light of the light source for each group.

8. The substrate processing apparatus according to claim 7, wherein

the light irradiating unit and the light receiving unit include a light irradiating optical system and a light receiving optical system, respectively,

the light irradiating optical system and the light receiving optical system are shared by the plurality of flow passage portions, and

the moving mechanism is configured to move the light irradiating optical system and the light receiving optical system relatively along the direction of arrangement of the flow passage portions.

9. The substrate processing apparatus according to claim 7, wherein

a test flow passage portion as a part of a flow passage of a test fluid including test particles at a preset ratio, the test flow passage portion constituting a measurement region for measurement of the test particles in the test fluid, is provided at a position along the direction of arrangement of the measurement flow passage portions,

the light irradiating unit selects one of the measurement flow passage portions and the test flow passage portion, and forms the optical path, and

the detecting unit detects the foreign matter in the fluid in the measurement flow passage portion on the basis of a signal output from the light receiving element when the light irradiating unit forms the optical path in the test flow passage portion.

10. A substrate processing method for processing a substrate by supplying a fluid to the substrate, the substrate processing method comprising:

a step of forming an optical path in measurement flow passage portions by using a light irradiating unit shared by measurement flow passage portions, the measurement flow passage portions being part of a respective plurality of supply paths of fluids to be supplied to the substrate, and the measurement flow passage portions constituting measurement regions for measurement of foreign matter in the fluids and being disposed so as to form a row with each other;

a step of moving the light irradiating unit relatively along a direction of arrangement of the flow passage portions by a moving mechanism to form the optical path within the flow passage portion selected among the plurality of flow passage portions;

a step of receiving light transmitted by the flow passage portion by a light receiving element included in a light receiving unit; and

a step of detecting foreign matter in the fluid by a detecting unit on a basis of a signal output from the light receiving element, wherein

the light irradiating unit and the light receiving unit include a light irradiating optical system and a light receiving optical system, respectively,

the light irradiating optical system and the light receiving optical system are shared by the plurality of flow passage portions, and

the substrate processing method includes a step of moving, by the moving mechanism, the light irradiating optical system and the light receiving optical system relatively along the direction of arrangement of the flow passage portions.

11. The substrate processing method according to claim 10, further comprising:

a step of making fluids having indexes of refraction different from each other flow through one flow passage portion and another flow passage portion, respectively, among the plurality of flow passage portions; and

a step of displacing, by a lens displacing mechanism, a condensing lens included in the light irradiating optical system and a light receiving lens included in the light receiving optical system in a direction of the optical path according to the indexes of refraction of the fluids.

12. The substrate processing method according to claim 10, wherein

a test flow passage portion as a part of a flow passage of a test fluid including test particles at a preset ratio, the test flow passage portion constituting a measurement region for measurement of the test particles in the test fluid, is provided at a position along the direction of arrangement of the measurement flow passage portions,

the substrate processing method includes a step of selecting either the measurement flow passage portions or the test flow passage portion and forming the optical path by the light irradiating unit, and

the step of detecting the foreign matter in the fluid in the measurement flow passage portion by the detecting unit includes a step of detecting the foreign matter in the fluid in the measurement flow passage portion on the basis of a signal output from the light receiving element when the optical path is formed in the test flow passage portion.