

WHAT IS CLAIMED IS:

1. A apparatus for treating an object to be treated, the apparatus comprising:

5 a loader unit carrying a conveying tray where a plurality of objects to be treated are disposed into a carrying-in unit;

a dumping unit picking up the objects to be treated from the conveying tray and performing a dumping to load the objects to be treated into a process tray;

a treatment unit performing a treatment on the objects to be treated after the process tray where the objects to be treated are loaded is carried in; and

10 a conveying unit conveying the conveying tray or the process tray between the carrying-in unit, the dumping unit, and the treatment unit.

2. The apparatus of claim 1, wherein the conveying tray and the process tray are formed of different materials.

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3. The apparatus of claim 2, wherein the process tray is formed of a stronger heat resistance material than the conveying tray.

4. The apparatus of claim 3, wherein the process tray is formed of ceramic material and the conveying tray is formed of plastic material.

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5. The apparatus of claim 1, wherein the loader unit comprises:
a main loader picking up the conveying tray and carrying the picked up conveying tray into a standby unit;

a sub loader picking up a cover member at a top of the conveying tray and positioning the picked up cover member at one side of the standby unit; and

a push member pushing the conveying tray having the cover member removed, from the standby unit toward the carrying-in unit.

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6. The apparatus of claim 1, wherein the dumping unit comprises:

a first dumping support where the conveying tray is disposed;

a second dumping support where the process tray is disposed; and

a dumping member transferring the objects to be treated between the
10 conveying tray and the process tray.

7. The apparatus of claim 1, wherein the treatment unit comprises:

a process chamber having a space therein;

a support member disposed inside the process chamber and supporting the
15 process tray; and

a plasma supply unit supplying plasma into the process chamber.

8. The apparatus of claim 1, wherein the conveying unit comprises:

a first conveying unit conveying the conveying tray between the carrying-in
20 unit and the dumping unit;

a second conveying unit carrying the conveying tray, where the objects are treated completely in the treatment unit and are loaded completely, to the outside of the dumping unit; and

a third conveying unit conveying the process tray between the dumping unit
25 and the treatment unit.

9. The apparatus of claim 8, wherein the second conveying unit may convey the conveying tray where the dumping to the process tray is completed by the dumping unit to the outside of the dumping unit.

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10. The apparatus of claim 1, further comprising a standby part where the conveying tray carried out from the dumping unit stays temporarily after the dumping to the process tray is completed by the dumping unit.

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11. The apparatus of claim 1, further comprising a carrying-out unit carrying the conveying tray, where the objects are treated completely in the treatment unit and are loaded completely, to the outside of the apparatus.

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12. The apparatus of any one of claims 1 to 11, further comprising a reverse unit reversing the objects to be treated.

13. The apparatus of claim 12, wherein the carrying-in unit, the reverse unit, and the dumping unit are sequentially disposed along a first direction.

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14. The apparatus of claim 13, wherein the treatment unit and the dumping unit are disposed along a second direction vertical to the first direction as seen from the top.

15. The apparatus of claim 12, wherein the conveying tray comprises:

a first conveying tray where the objects to be treated are loaded and carried
in before the treatment; and

an empty second conveying tray where no objects to be treated are loaded,
wherein the reverse unit comprises:

5 a reverse support where the first conveying tray is disposed;

a buffer support where the second conveying tray is disposed; and

a reverse driving member rotating the first conveying tray and the second
conveying tray on the first conveying tray by 180 degrees to allow the objects to be
treated to be transferred and loaded from the first conveying tray to the second
10 conveying tray.

16. The apparatus of claim 15, further comprising:

a radio frequency identifier indicating a type of the objects loaded into the
first conveying tray and configured to be detachable from the first conveying tray;

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a radio frequency identification reader reading the radio frequency identifier,
wherein the process tray comprises:

a first process tray where objects to be treated, which require a reverse in the
reverse unit, are loaded;

20 a second process tray where objects to be treated, which require no reverse
in the reverse unit, are loaded,

wherein the radio frequency identification reader determines whether to
provide the first process tray or the second process tray to the second dumping
support and whether to carry the first conveying tray into the reverse unit, according
25 to a reading result of the radio frequency identification reader.

17. A method of treating an object to be treated, the method comprising:
carrying in a conveying tray where a plurality of objects to be treated are
loaded;

5 picking up the objects to be treated from the conveying tray and performing
a dumping to load the objects to be treated into a process tray; and
performing a treatment on the objects to be treated after the process tray
where the objects to be treated are loaded is carried into a treatment unit.

10 18. The apparatus of claim 17, wherein the conveying tray and the
process tray are formed of different materials.

19. The method of claim 18, wherein the process tray is formed of a
stronger heat resistance material than the conveying tray.

15 20. The method of claim 19, wherein the process tray is formed of
ceramic material and the conveying tray is formed of plastic material.

21. The method of claim 17, further comprising reversing the objects to
20 be treated before the dumping of the objects to be treated.

22. The method of claim 21, wherein the conveying tray comprises:
a first conveying tray where the objects to be treated are loaded and carried
in before the treatment; and
25 an empty second conveying tray where no objects to be treated are loaded,

wherein the reversing of the objects to be treated comprises:
positioning the first conveying tray on a reverse support and positioning the
second conveying tray on a buffer support;
positioning the second conveying tray on the first conveying tray; and
5 rotating the first conveying tray and the second conveying tray on the first
conveying tray by 180 degrees at the same time.

23. The method of claim 22, wherein the process tray comprises:
a first process tray where objects to be treated, which require a reverse in the
10 reverse unit, are loaded;
a second process tray where objects to be treated, which require no reverse
in the reverse unit, are loaded,
wherein the reversing of the objects to be treated is performed selectively,
further comprising determining whether to perform the reversing of the
15 objects to be treated before the carrying in of the conveying tray,
wherein the determining of whether to perform the reversing of the objects
to be treated comprises:
if the reverse is necessary, providing the process tray to the first process tray
during the dumping of the objects to be treated and performing the reversing of the
20 objects to be treated; and
if the reverse is unnecessary, providing the process tray to the second
process tray during the dumping of the objects to be treated and not performing the
reversing of the objects to be treated.

24. The method of claim 23, wherein the determining of the objects to be treated is performed by reading a radio frequency identification through a radio frequency identification reader, wherein the radio frequency identification indicates a type of the objects loaded into the first conveying tray and is detachable from the
5 first conveying tray.

WHAT IS CLAIMED IS:

1. A apparatus for treating an object to be treated, the apparatus comprising:
 - a loader unit carrying a conveying tray where a plurality of objects to be treated are disposed into a carrying-in unit;
 - a dumping unit picking up the objects to be treated from the conveying tray and performing a dumping to load the objects to be treated into a process tray;
 - a treatment unit performing a treatment on the objects to be treated after the process tray where the objects to be treated are loaded is carried in;
 - a conveying unit conveying the conveying tray or the process tray between the carrying-in unit, the dumping unit, and the treatment unit; and
 - a reverse unit reversing the objects to be treated,wherein the conveying tray comprises:
 - a first conveying tray where the objects to be treated are loaded and carried in before the treatment; and
 - an empty second conveying tray where no objects to be treated are loaded,wherein the reverse unit comprises:
 - a reverse support where the first conveying tray is disposed;
 - a buffer support where the second conveying tray is disposed; and
 - a reverse driving member rotating the first conveying tray and the second conveying tray on the first conveying tray by 180 degrees to allow the objects to be treated to be transferred and loaded from the first conveying tray to the second conveying tray.
2. The apparatus of claim 1, wherein the conveying tray and the process tray are formed of different materials.

3. The apparatus of claim 2, wherein the process tray is formed of a stronger heat resistance material than the conveying tray.

4. The apparatus of claim 3, wherein the process tray is formed of ceramic material and the conveying tray is formed of plastic material.

5. A apparatus for treating an object to be treated, the apparatus comprising:
a loader unit carrying a conveying tray where a plurality of objects to be treated are disposed into a carrying-in unit;

a dumping unit picking up the objects to be treated from the conveying tray and performing a dumping to load the objects to be treated into a process tray;

a treatment unit performing a treatment on the objects to be treated after the process tray where the objects to be treated are loaded is carried in; and

a conveying unit conveying the conveying tray or the process tray between the carrying-in unit, the dumping unit, and the treatment unit,

wherein the loader unit comprises:

a main loader picking up the conveying tray and carrying the picked up conveying tray into a standby unit;

a sub loader picking up a cover member at a top of the conveying tray and positioning the picked up cover member at one side of the standby unit; and

a push member pushing the conveying tray having the cover member removed, from the standby unit toward the carrying-in unit.

6. The apparatus of claim 1, wherein the dumping unit comprises:

a first dumping support where the conveying tray is disposed;

a second dumping support where the process tray is disposed; and
a dumping member transferring the objects to be treated between the conveying tray and the process tray.

7. The apparatus of claim 1, wherein the treatment unit comprises:
a process chamber having a space therein;
a support member disposed inside the process chamber and supporting the process tray; and
a plasma supply unit supplying plasma into the process chamber.

8. A apparatus for treating an object to be treated, the apparatus comprising:
a loader unit carrying a conveying tray where a plurality of objects to be treated are disposed into a carrying-in unit;
a dumping unit picking up the objects to be treated from the conveying tray and performing a dumping to load the objects to be treated into a process tray;
a treatment unit performing a treatment on the objects to be treated after the process tray where the objects to be treated are loaded is carried in; and
a conveying unit conveying the conveying tray or the process tray between the carrying-in unit, the dumping unit, and the treatment unit,
wherein the conveying unit comprises:
a first conveying unit conveying the conveying tray between the carrying-in unit and the dumping unit;
a second conveying unit carrying the conveying tray, where the objects are treated completely in the treatment unit and are loaded completely, to the outside of the dumping unit; and

a third conveying unit conveying the process tray between the dumping unit and the treatment unit.

9. The apparatus of claim 8, wherein the second conveying unit may convey the conveying tray where the dumping to the process tray is completed by the dumping unit to the outside of the dumping unit.

10. The apparatus of claim 1, further comprising a standby part where the conveying tray carried out from the dumping unit stays temporarily after the dumping to the process tray is completed by the dumping unit.

11. The apparatus of claim 1, further comprising a carrying-out unit carrying the conveying tray, where the objects are treated completely in the treatment unit and are loaded completely, to the outside of the apparatus.

12. The apparatus of claim 1, wherein the carrying-in unit, the reverse unit, and the dumping unit are sequentially disposed along a first direction.

13. The apparatus of claim 1, wherein the treatment unit and the dumping unit are disposed along a second direction vertical to the first direction as seen from the top.

14. The apparatus of claim 1, further comprising:
a radio frequency identifier indicating a type of the objects loaded into the first conveying tray and configured to be detachable from the first conveying tray; and
a radio frequency identification reader reading the radio frequency identifier,

wherein the process tray comprises:

a first process tray where objects to be treated, which require a reverse in the reverse unit, are loaded;

a second process tray where objects to be treated, which require no reverse in the reverse unit, are loaded,

wherein the radio frequency identification reader determines whether to provide the first process tray or the second process tray to the dumping unit and whether to carry the first conveying tray into the reverse unit, according to a reading result of the radio frequency identification reader.

15. A method of treating an object to be treated, the method comprising:

carrying in a conveying tray where a plurality of objects to be treated are loaded;

picking up the objects to be treated from the conveying tray and performing a dumping to load the objects to be treated into a process tray; and

performing a treatment on the objects to be treated after the process tray where the objects to be treated are loaded is carried into a treatment unit; and

reversing the objects to be treated before the dumping of the objects to be treated,

wherein the conveying tray comprises:

a first conveying tray where the objects to be treated are loaded and carried in before the treatment; and

an empty second conveying tray where no objects to be treated are loaded,

wherein the reversing of the objects to be treated comprises:

positioning the first conveying tray on a reverse support and positioning the second conveying tray on a buffer support;

positioning the second conveying tray on the first conveying tray; and

rotating the first conveying tray and the second conveying tray on the first conveying tray by 180 degrees at the same time.

16. The apparatus of claim 15, wherein the conveying tray and the process tray are formed of different materials.

17. The method of claim 16, wherein the process tray is formed of a stronger heat resistance material than the conveying tray.

18. The method of claim 17, wherein the process tray is formed of ceramic material and the conveying tray is formed of plastic material.

19. The method of claim 15, wherein the process tray comprises:
a first process tray where objects to be treated, which require the reversing, are loaded;

a second process tray where objects to be treated, which don't require the reversing, are loaded,

wherein the reversing of the objects to be treated is performed selectively,

further comprising determining whether to perform the reversing of the objects to be treated before the carrying in of the conveying tray,

wherein the determining of whether to perform the reversing of the objects to be treated comprises:

if the reversing is necessary, providing the process tray to the first process tray during the dumping of the objects to be treated and performing the reversing of the objects to be treated; and

if the reversing is unnecessary, providing the process tray to the second process tray during the dumping of the objects to be treated and not performing the reversing of the objects to be treated.

20. The method of claim 19, wherein the determining of the objects to be treated is performed by reading a radio frequency identification through a radio frequency identification reader, wherein the radio frequency identification indicates a type of the objects loaded into the first conveying tray and is detachable from the first conveying tray.