

What is Claimed:

1. A plasma treatment apparatus comprising:
 - a wafer transfer tray having a first surface and a second surface opposite to the first surface, and configured to hold a wafer on the first surface;
 - a cooling unit configured to cool the wafer transfer tray;
 - a conductive supporter configured to support the second surface of the wafer transfer tray; and
 - a double-surface electrostatic attractor configured to monopolarly-electrostatically attract the wafer to the first surface of the wafer transfer tray and to monopolarly-electrostatically attract the supporter to the second surface of the wafer transfer tray, the double-surface electrostatic attractor comprising a conductive member formed of a conductive layer or a conductor, wherein
 - the conductive member and the supporter are attracted to each other via an insulating layer,
 - a direct current voltage application unit configured to apply a direct current voltage is connected to the double-surface electrostatic attractor,
 - a ground section is connected to the supporter such that the supporter has a ground potential with respect to the direct current voltage.
2. The plasma treatment apparatus according to claim 1, wherein
 - a radio frequency voltage application unit is connected to the supporter, and
 - the ground section configured to cut a radio frequency voltage applied by the radio frequency voltage application unit so that the supporter has a ground potential with

respect to the direct current voltage.

3. The plasma treatment apparatus according to claim 1 or 2, wherein
- the wafer transfer tray has a base formed of an insulating body, a first conductive layer for electrostatic attraction which forms the conductive member and which is embedded at a position in the vicinity of the first surface of the base, and a second conductive layer for electrostatic attraction embedded at a position in the vicinity of the second surface of the base and electrically connected to the first conductive layer, and
- the direct current voltage application unit configured to apply a direct current voltage is connected to the first conductive layer and the second conductive layer.

4. The plasma treatment apparatus according to claim 1, wherein
- the wafer transfer tray has a base formed of a high resistance body having a resistance value of $10^8 \Omega$ or more and $10^{11} \Omega$ or less, and a first conductive layer for electrostatic attraction embedded at a position in the vicinity of the first surface of the base, and
- the direct current voltage application unit configured to apply a direct current voltage is connected to the first conductive layer.

5. The plasma treatment apparatus according to claim 1 or 2, wherein

the wafer transfer tray has a base formed of a metal, a first insulating layer disposed at the first surface of the base and in which a first conductive layer for electrostatic attraction forming the conductive member is embedded, and a second insulating layer disposed at the second surface of the base and in which a second conductive layer for electrostatic attraction forming the conductive member and electrically connected to the first conductive layer is embedded, and

the direct current voltage application unit configured to apply a direct current voltage is connected to the first conductive layer and the second conductive layer.

6. The plasma treatment apparatus according to claim 1 or 2, wherein

the wafer transfer tray has a base formed of a metal that constitutes a conductor for electrostatic attraction forming the conductive member, and an insulating layer configured to cover an outer circumferential surface of the base, and

the direct current voltage application unit configured to apply a direct current voltage is connected to the base.

7. The plasma treatment apparatus according to any one of claims 2 to 6,
wherein

the ground section comprises a low-pass filter configured to cut an alternating current voltage having a predetermined frequency range applied to the supporter.