WHAT IS CLAIMED IS:

1. A filter device comprising:

a plurality of coils;

a plurality of capacitors connected between the plurality of coils and the ground; and

a frame electrically grounded and accommodating therein the plurality of coils,

wherein the plurality of coils constitute a plurality of coil groups each including two or more coils,

the two or more coils in each of the plurality of coil groups are provided such that respective windings of the two or more coils extend spirally about a central axis and respective turns of the two or more coils are sequentially and repeatedly arranged in an axial direction in which the central axis extends,

the plurality of coil groups are provided coaxially with the central axis, and

a pitch between the respective turns of the two or more coils of any one coil group among the plurality of coil groups is larger than a pitch between the respective turns of the two or more coils of the coil group provided inside the one coil group among the plurality of coil groups.

2. The filter device of claim 1, wherein the pitch between the respective turns of the two or more coils of any one coil group is set such that the plurality of coils have substantially the same inductance.

3. The filter device of claim 1, wherein the plurality of coils have substantially the same coil length.

4. The filter device of claim 3, wherein a difference in coil length between a coil having a maximum coil length and a coil having a minimum coil length among the plurality of coils is 3% or less of the minimum coil length.

5. The filter device of claim 3, wherein the windings of the plurality of coils have one ends and remaining ends at a side of the plurality of capacitors, respectively, and the one ends of the windings of the plurality of coils are provided along a plane orthogonal to the central axis.

6. The filter device of claim 5, wherein the plurality of coils have extension lines which extend in the axial direction from the one ends of the windings of the plurality of coils, and the extension lines of the two or more coils in each of the plurality of coil groups are disposed at equal intervals in a circumferential direction about the central axis.

7. The filter device of claim 6, wherein the extension lines of the plurality of coils are provided in an angular range having an angle of 90° or more and 270° or less about the central axis.

8. The filter device of claim 1, wherein a distance in a radial direction of a gap between any two coil groups, which are adjacent to each other in the radial direction among the plurality of coil groups, is 1.5 mm or less.

9. The filter device of claim 1, wherein an inner diameter of the two or more coils of the coil group provided at an outermost side among the plurality of coil groups is

equal to or less than 1.83 times an inner diameter of the two or more coils of the coil group provided at an innermost side among the plurality of coil groups.

10. A plasma processing apparatus comprising:

a chamber main body;

a stage provided in the chamber main body and having a lower electrode and a plurality of heaters;

a high-frequency power source electrically connected to the lower electrode;

a heater controller configured to provide electric power to the plurality of heaters; and

the filter device of claim 1,

wherein each of the plurality of coils of the filter device is electrically connected between the heater controller and a corresponding heater among the plurality of heaters.