WHAT IS CLAIMED IS:

1. A grinding wheel comprising:

an annular base having a free end portion; and

a plurality of segment grindstones fixed on the free end portion of the annular base in a state of being spaced from one another in a circumferential direction,

wherein the plurality of segment grindstones are divided into a plurality of grindstone groups each including a predetermined number of segment grindstones,

each of the segment grindstones included in each of the grindstone groups has a grinding surface formed into a rectangular shape having a long side and a short side, and

the segment grindstones of each of the grindstone groups are sequentially fixed on the free end portion of the annular base from an outer circumferential side toward an inner circumferential side such that directions in which the long sides of the segment grindstones extend are changed from the circumferential direction to a diametric direction of the free end portion,

the segment grindstone on the outer circumferential side and the segment grindstone on the inner circumferential side being included in a same grindstone group, and

wherein the grinding wheel is configured to be used in a wafer grinding method.

2. The grinding wheel according to claim 1, wherein the segment grindstones are sequentially disposed in an impeller form in the circumferential direction of the free end portion to form each of the grindstone groups.

3. A wafer grinding method using a grinding wheel that includes an annular base having a free end portion and a plurality of segment grindstones fixed on the free end portion of the annular base in a state of being spaced from one another in a circumferential direction, the plurality of segment grindstones being divided into a plurality of grindstone groups each including a predetermined number of segment grindstones, each of the segment grindstones included in each of the grindstone groups having a grinding surface formed into a rectangular shape having a long side and a short side, the segment grindstones of the grindstone group being sequentially fixed on the free end portion of the annular base from an outer circumferential side toward an inner circumferential side such that directions in which the long sides of the segment grindstones extend are changed from the circumferential direction to a diametric

direction of the free end portion,

the wafer grinding method comprising:

a holding step of holding a wafer by a rotatable chuck table while a center of the wafer is positioned at a rotational center of the chuck table;

a positioning step of rotating the grinding wheel in a direction extending from the segment grindstone on the outer circumferential side whose long side is disposed along the circumferential direction, to the segment grindstone on the inner circumferential side whose long side is disposed along the diametric direction, the segment grindstone on the outer circumferential side and the segment grindstone on the inner circumferential side being included in a same grindstone group, and positioning the grinding wheel such that the segment grindstone on an outermost circumferential side passes through the center of the wafer; and

a grinding step of bringing the segment grindstones of the rotating grinding wheel into contact with the wafer held by the rotating chuck table, to grind the wafer while grinding water is supplied from a central portion of the grinding wheel, after the positioning step is carried out.

4. The wafer grinding method according to claim 3, wherein the segment grindstones are sequentially disposed in an impeller form in the circumferential direction of the free end portion to form each of the grindstone groups.

5. The wafer grinding method according to claim 3, wherein

in the grinding step, the grinding water is introduced to a grinding part where the grindstone groups including the segment grindstones are brought into contact with a back surface of a wafer, by a centrifugal force.

6. The wafer grinding method according to claim 5, wherein

in the grinding step, the grinding water is introduced to the grinding part on the outer circumferential side by the centrifugal force, and the plurality of grindstone groups in the impeller form functions as centrifugal pumps, to discharge the grinding water from the inside to the outside of the grinding wheel.

7. The wafer grinding method according to any one of claims 3 to 6,

wherein in the positioning step, not all, but only

some of the segment grindstones forming each of the grindstone groups are allowed to pass through the center of the wafer.

8. The wafer grinding method according to claim 7, wherein in the positioning step, the segment grindstone disposed at an adjacent position to the segment grindstone on the outermost circumferential side also passes through the center of the wafer.