WHAT IS CLAIMED IS:

1. A method of processing a wafer having a plurality of devices formed on a face side thereof and having a beveled outer circumferential edge portion, the method comprising:

a holding step of holding the wafer under suction on an upper surface of a porous plate, the wafer being rotatable along circumferential directions thereof with the face side facing upwardly; and

a processing step of, after the holding step, processing the outer circumferential edge portion of the wafer by, while a lower end portion of a first annular cutting blade that is rotating is cutting into the outer circumferential edge portion of the wafer and a cutting liquid is being supplied from a first liquid supply unit disposed around the first cutting blade, supplying a cleaning liquid from a second liquid supply unit disposed around a second annular cutting blade provided separately from the first cutting blade to a center of the face side of the wafer and rotating the wafer to form a film of the cleaning liquid that covers the face side of the wafer.

2. The method of processing a wafer according to claim 1, further comprising:

an ultraviolet ray applying step of, before the

processing step, applying ultraviolet rays to the face side of the wafer to render the face side hydrophilic.

3. The method of processing a wafer according to claim 1, wherein

the processing step includes

a cutting step of increasing a depth by which the lower end portion of the rotating first cutting blade cuts into the outer circumferential edge portion of the wafer from the face side, and

a rotating step of rotating the wafer in at least one revolution, and

the cutting step and the rotating step are alternately repeated.

4. The method of processing a wafer according to claim 2, wherein

the processing step includes

a cutting step of increasing a depth by which the lower end portion of the rotating first cutting blade cuts into the outer circumferential edge portion of the wafer from the face side, and

a rotating step of rotating the wafer in at least one revolution, and

the cutting step and the rotating step are alternately repeated.