WHAT IS CLAIMED IS:

1. A protective film forming method for forming a protective film of a water-soluble resin on a front side of a wafer, the front side of said wafer being partitioned by a plurality of crossing division lines to thereby define a plurality of separate regions where a plurality of devices are each formed, said protective film forming method comprising:

a wafer supporting step of attaching a back side of said wafer to an adhesive tape supported to an annular frame having an inside opening for receiving said wafer, thereby supporting said wafer through said adhesive tape to said annular frame;

a wafer holding step of holding said wafer supported through said adhesive tape to said annular frame on a spinner table in a condition where the front side of said wafer is oriented upward;

a protective film forming step of rotating said spinner table and dropping said water-soluble resin onto a center of the front side of said wafer to thereby form said protective film of said water-soluble resin on the front side of said wafer; and

a water-soluble resin removing step of removing said water-soluble resin scattered onto an upper surface of said annular frame in said protective film forming step;

said water-soluble resin removing step including the steps of rotating said spinner table, positioning a cleaning water nozzle above the upper surface of said annular frame held on said spinner table, supplying a cleaning water from said cleaning water nozzle to the upper surface of said annular frame, positioning an air nozzle adjacent to said cleaning water nozzle on a downstream side thereof in a rotational direction of said spinner table, and supplying air from said air nozzle against the flow of said cleaning water on the upper surface of said annular frame, whereby said cleaning water is forced to temporarily stay on the upper surface of said annular frame by said air supplied and is then expelled outward of said annular frame.