CLAIMS

1. A substrate-holding device that positions and holds a substrate on which a thin film is to be formed on one main surface, the substrate-holding device comprising:

a mask member having an opening that defines a film forming region in the main surface, and disposed at a position where the opening faces the main surface in a first direction;

one or more biasing devices configured to bias the substrate toward the mask member along the first direction; and

a contact member integrated with the mask member and configured to come into contact with an outer edge portion of the substrate, wherein

the contact member comprises

an inclined surface that is inclined toward an inner side of the mask member in a second direction intersecting with the first direction as the inclined surface approaches the mask member in the first direction,

an extension surface that is located closer to the mask member than the inclined surface in the first direction and extends along the first direction, and

an abutment surface that is located closer to the mask member than the extension surface in the first direction and abuts against the outer edge portion of the substrate in the first direction,

the substrate in a state of being biased by the one or more biasing devices and the mask member are brought close to each other in the first direction, the outer edge portion of the substrate is guided to an abutment surface side along the inclined surface, and the abutment surface abuts against the outer edge portion of the substrate to position the substrate.

the outer edge portion of the substrate comprises an outer edge surface continuous with the main surface which is a flat surface, and the outer edge surface is inclined with respect to the main surface, and

the abutment surface is a surface inclined along the outer edge surface and abuts against the outer edge surface.

2. A substrate-holding device that positions and holds a substrate on which a thin film is to be formed on one main surface, the substrate-holding device comprising:

a mask member having an opening that defines a film forming region in the main surface, and disposed at a position where the opening faces the main surface in a first direction;

one or more biasing devices configured to bias the substrate toward the mask member along the first direction; and

a contact member integrated with the mask member and configured to come into contact with an outer edge portion of the substrate, wherein

the contact member comprises

an inclined surface that is inclined toward an inner side of the mask member in a second direction intersecting with the first direction as the inclined surface approaches the mask member in the first direction,

an extension surface that is located closer to the mask member than the inclined surface in the first direction and extends along the first direction, and

an abutment surface that is located closer to the mask member than the extension surface in the first direction and abuts against the outer edge portion of the substrate in the first direction,

the substrate in a state of being biased by the one or more biasing devices and the mask member are brought close to each other in the first direction, the outer edge portion of the substrate is guided to an abutment surface side along the inclined surface, and the abutment surface abuts against the outer edge portion of the substrate to position the substrate.

a material constituting the contact member comprises at least one of polyether ether ketone, a polyimide, a polybenzimidazole resin, a fluororesin, a fluororubber, and an elastomer material.

3. The substrate-holding device according to claim 1 or 2, wherein the contact member includes a plurality of contact members fixed to a surface of the mask member on a side facing the substrate, and

each of the plurality of contact members comprises the inclined surface, the extension surface, and the abutment surface, and is in contact with the outer edge portion of the substrate.

4. The substrate-holding device according to claim 3, wherein in a case where the substrate has a polygonal shape when the substrate is viewed from the first direction, each of the plurality of contact members is in contact with a corner portion of the outer edge portion of the substrate.

5. The substrate-holding device according to claim 4, wherein the contact member has

a bent shape when the contact member is viewed from the first direction,

an inner wall surface of the contact member is divided into two regions intersecting with each other at a bending point,

each of the two regions comprises the inclined surface, the extension surface, and the abutment surface,

a recess formed toward an outside of the contact member is provided in a portion of the contact member where the two regions intersect with each other,

the extension surfaces of the two regions are arranged with the recess interposed therebetween, and

the abutment surfaces of the two regions are arranged with the recess interposed therebetween.

6. The substrate-holding device according to claim 5, wherein the recess is formed by curving the inner wall surface of the contact member toward the outside of the contact member, and

in a state where the substrate is held by the substrate-holding device, the corner portion of the outer edge portion of the substrate enters the recess and is separated from the inner wall surface of the contact member.

7. The substrate-holding device according to claim 3, wherein in a case where the substrate has a polygonal shape when the substrate is viewed from the first direction, at least one of the plurality of contact members comes into contact with the outer edge portion of the substrate at a central portion of a side forming an outer edge of the substrate.

8. The substrate-holding device according to any one of claims 1 to 7, wherein a plurality of the biasing devices are provided, and

in a case where the substrate has a polygonal shape when the substrate is viewed from the first direction, in a plurality of corner portions of the outer edge portion of the substrate, the biasing devices are in contact with the other main surface located on a side opposite to the main surface on which the thin film is to be formed, and bias the substrate toward the mask member.

9. The substrate-holding device according to claim 8, wherein each of the biasing devices comprises a body portion in contact with the other main surface at a tip thereof, and an

elastic body that applies, to the body portion, an elastic force for pressing the tip of the body portion against the other main surface, and

the elastic body is provided for each of the biasing devices.

10. The substrate-holding device according to claim 9, wherein the body portion and the elastic body are disposed at positions farther from the main surface than the other main surface of the substrate in the first direction.

11. A method for manufacturing a substrate with a conductive film in which a conductive film is formed on one main surface of a substrate, the method comprising:

positioning the substrate using the substrate-holding device according to any one of claims 1 to 7; and

forming the conductive film on the one main surface by a dry film forming method after the substrate is positioned, wherein

when the substrate is positioned, the substrate is biased toward the mask member in the first direction by the one or more biasing devices, the substrate in a state of being biased by the one or more biasing devices and the mask member are brought close to each other in the first direction, the outer edge portion of the substrate is guided to the abutment surface side of the contact member along the inclined surface of the contact member, and the abutment surface abuts against the outer edge portion of the substrate.