CLAIMS

1. An imprinting device that pressurizes an object subjected to pattern formation by a mold and by a substrate to transfer a molding pattern of the mold to the object subjected to pattern formation comprising:

a stage on which either one of the mold or the substrate is mounted;

placing means for placing either one of the mold or the substrate not mounted on the stage at a position where the mold and the substrate hold therebetween the object subjected to pattern formation, and also the position at which the mold and the substrate are freely movable in a direction becoming close to each other;

a pressure adjusting unit that comprises a pressure adjusting chamber in which the mold and the substrate are placed gas-tightly;

depressurizing means for depressurizing an interior of the pressure adjusting chamber;

pressurizing means for pressurizing the interior of the pressure adjusting chamber within a range that the mold and the substrate are freely movable in the direction becoming close to each other; and

fixing means for fixing the object subjected to pattern formation to the molding pattern.

2. The imprinting device according to claim 1, further comprising slide preventing means for preventing slide movement of the mold and of the substrate.

3. The imprinting device according to claim 1, wherein the placing means is movable to a position at which slide movement of the mold and of the substrate is prevented.

4. The imprinting device according to any one of claims 1 to 3, wherein the placing means comprises position detecting means for detecting a relative position of the mold to the substrate.

5. The imprinting device according to claim 4, further comprising control means for controlling at least either one of the placing means or the pressure adjusting means based on detection information from the position detecting means.

6. The imprinting device according to any one of claims 1 to 5, wherein the placing means places the mold and the substrate so as to be in parallel with each other.

7. The imprinting device according to any one of claims 1 to 6, wherein the mold comprises a wall portion that surrounds a circumference of the molding pattern.

8. The imprinting device according to any one of claims 1 to 7, wherein a height of the wall portion relative to a surface where the molding pattern is formed is equal to or higher than 1 μm.

9. The imprinting device according to claim 7 or 8, wherein a difference between a maximum value of the height of the wall portion relative to a surface where the molding pattern is formed and a minimum value thereof is equal to or smaller than 1 μm.

10. The imprinting device according to any one of claims 1 to 9, wherein the fixing means is light emitting means for emitting light to the object subjected to pattern formation for curing, or is temperature adjusting means for adjusting a temperature of the object subjected to pattern formation.

11. An imprinting method of pressuring an object subjected to pattern formation by a mold and by a substrate to transfer a molding pattern of the mold to the object subjected to pattern formation comprising:

a depressurizing process of eliminating a gas between the mold and the object subjected to pattern formation;

a placing process of placing, in the depressurization, the mold and the substrate at, with the object subjected to pattern formation being held therebetween, a position at which the mold and the substrate are freely movable in a direction becoming close to each other;

a pressurizing process of pressurizing the mold and the object subjected to pattern formation by gas within a range that the mold and the substrate are freely movable in the direction becoming close to each other; and

a fixing process of fixing the object subjected to pattern formation to the molding pattern.

12. The imprinting method according to claim 11, wherein the pressurizing process is executed while slide movement of the mold and of the substrate is prevented.

13. The imprinting method according to claim 11 or 12, wherein the placing process places the mold and the substrate so as to be in parallel with each other.

14. The imprinting method according to any one of claims 11 to 13, wherein the fixing process is a light emitting process of emitting light to the object subjected to pattern formation for curing, thereby fixing the molding pattern to the object subjected to pattern formation, or is a temperature adjusting process of adjusting a temperature of the object subjected to pattern formation for curing, thereby fixing the molding pattern to the object subjected to pattern formation.

15. The imprinting method according to any one of claims 11 to 14, wherein the mold comprises a wall portion that surrounds a circumference of the molding pattern.

16. The imprinting method according to claim 15, wherein a height of the wall portion relative to a surface where the molding pattern is formed is equal to or higher than 1 μm.

17. The imprinting method according to claim 15 or 16, wherein a difference between a maximum value of the height of the wall portion relative to a surface where the molding pattern is formed and a minimum value thereof is equal to or smaller than 1 μm.

18. A stamp comprising a resin-made molding component formed on a substrate,

wherein the resin-made molding component comprises:

a surface provided with a pattern;

a side face extending from the surface provided with the pattern to the substrate; and

a circumferential portion extending from the side face toward an external edge of the substrate.

19. The stamp according to claim 18, wherein the resin-made molding component is not formed at the external edge of the substrate.

20. The stamp according to claim 18 or 19, wherein the resin-made molding component is a cured resin.

21. The stamp according to claim 18 or 19, wherein the pattern comprises convexities and concavities.

22. The stamp according to claim 21, wherein a minimum dimension of a width of the convexity is equal to or smaller than 100 μm.

23. The stamp according to claim 21, wherein a minimum dimension of a width of the concavity is equal to or smaller than 100 μm.

24. The stamp according to claim 21, wherein a depth of the concavity is equal to or greater than 10 nm.

25. The stamp according to claim 18 or 19, wherein a height of the side face is equal to or higher than 1 μm.

26. The stamp according to claim 18 or 19, wherein a difference between a maximum value of a height of the side face relative to the surface provided with the pattern and a minimum value thereof is equal to or smaller than 1 μm.

27. A transferring method comprising:

picking up a micro-component by the stamp according to claim 18 or 19, and transferring the micro-component to the substrate.

28. A production method of an MEMS comprising a plurality of micro-components having a same or different functions and integrated on a single substrate, the method comprising:

a process of transferring the micro-component picked up by the stamp according to claim 18 or 19 to the substrate.