CLAIMS

1. A dental handpiece comprising:

a first cylindrical member;

a second cylindrical member in which a communication hole continuous with an internal space of the first cylindrical member is formed on a side wall, and connected to one end portion of the first cylindrical member on the side wall;

a vibration cylinder supporting a needle substrate in a state where a needle portion of a dental piece having the needle substrate and the needle portion extending from the needle substrate is protruded to an external space, and inserted into the second cylindrical member in a coaxial posture;

a rotating member disposed in the internal space of the first cylindrical member so that one end portion is directed to an internal space of the second cylindrical member via the communication hole; and

an actuator that drives the rotating member to rotate around a central axis,

wherein a cam protruding portion protruding at a position eccentric with respect to the central axis of the rotating member is provided in the one end portion of the rotating member,

a cam recessed portion into which the cam protruding portion is fitted is formed on an outside of a side wall of the vibration cylinder,

the cam recessed portion is formed so that the cam protruding portion of the rotating member is relatively displaceable in a circumferential direction of the vibration cylinder,

in response to rotational drive of the rotating member, the vibration cylinder is configured to vibrate or reciprocate in the circumferential direction,

in the cam recessed portion, an annular cam groove extending over an entire circumference on the outside of the side wall of the vibration cylinder, or a cam groove continuously extending in a portion in the circumferential direction on the outside of the side wall of the vibration cylinder is formed, and

the cam recessed portion is formed on the outside of the side wall of the

vibration cylinder so that a width of the cam recessed portion in an axial direction of the vibration cylinder is changed in the circumferential direction of the vibration cylinder.

2. The dental handpiece according to claim 1,

wherein at least one side surface of a pair of side surfaces of the cam recessed portion which face the axial direction of the vibration cylinder is formed as a waveform surface.

3. The dental handpiece according to claim 1,

wherein at least one side surface of a pair of side surfaces of the cam recessed portion which face the axial direction of the vibration cylinder is formed as a gear surface having a plurality of teeth, and

at least a portion of a side surface of the cam protruding portion is formed as a gear wheel surface having a plurality of teeth meshing with the gear surface.

4. The dental handpiece according to any one of claims 1 to 3,

wherein in the one end portion of the rotating member, a plurality of mounting holes for mounting the cam protruding portion are formed at locations where eccentricity with reference to the central axis of the rotating member is different.

5. The dental handpiece according to any one of claims 1 to 4,

wherein a sliding layer is formed in at least one of a surface of the cam protruding portion and a surface of the cam recessed portion.

6. A dental handpiece comprising:

a first cylindrical member;

a second cylindrical member in which a communication hole continuous with an internal space of the first cylindrical member is formed on a side wall, and connected to one end portion of the first cylindrical member on the side wall;

a vibration cylinder supporting a needle substrate in a state where a needle

portion of a dental piece having the needle substrate and the needle portion extending from the needle substrate is protruded to an external space, and inserted into the second cylindrical member in a coaxial posture;

a rotating member disposed in the internal space of the first cylindrical member so that one end portion is directed to an internal space of the second cylindrical member via the communication hole; and

an actuator that drives the rotating member to rotate around a central axis,

wherein a cam protruding portion protruding at a position eccentric with respect to the central axis of the rotating member is provided in the one end portion of the rotating member,

a cam recessed portion into which the cam protruding portion is fitted is formed on an outside of a side wall of the vibration cylinder,

the cam recessed portion is formed so that the cam protruding portion of the rotating member is relatively displaceable in a circumferential direction of the vibration cylinder,

in the cam recessed portion, an annular cam groove extending over an entire circumference on the outside of the side wall of the vibration cylinder, or a cam groove continuously extending in a portion in the circumferential direction on the outside of the side wall of the vibration cylinder is formed,

the cam recessed portion is formed on the outside of the side wall of the vibration cylinder so that a width of the cam recessed portion in an axial direction of the vibration cylinder is changed in the circumferential direction of the vibration cylinder, and

at least one side surface of a pair of side surfaces of the cam recessed portion which face the axial direction of the vibration cylinder is formed as a waveform surface.