

body and the housing. The rotary joint supplies fluids to the polishing table or the top ring through fluid connection ports formed in the housing and fluid passages formed inside the rotating body.

CITATION LIST

PATENT LITERATURE

[0006] Patent Literature 1: Japanese Patent Public Disclosure No. H11-325356

SUMMARY

TECHNICAL PROBLEM

[0007] However, in conventional techniques, suppression of generation of noises due to rotation of the rotary joint is not considered.

[0008] To be more specific, a bearing is generally installed by fitting between the rotating body and the housing. There are situations, however, where proper fitting is difficult due to problems associated with dimensional tolerances of the bearing, the rotating body and the housing, accuracy in assembly of these parts, and the like. Further, when the rotary joint is used to supply pure water, the rotating body is sometimes formed from resin so as to enable circulation of pure water. In this case, proper fitting becomes difficult due to a creep phenomenon and absolute strength of the resin.

[0009] When there is a difficulty in providing a proper fit between the bearing, the rotating body and the housing, a gap can be created between the bearing and the rotating body, or between the bearing and the housing. If that happens, vibrations are generated while the rotary joint rotates. The vibrations are likely to generate noises. The noises may be generated especially when the rotary joint is rotated at relatively low rotational speed.

[0010] An object of an embodiment of the present invention is to suppress generation of noises attributable to rotation of the rotary joint.

SOLUTION

[0011] An aspect of the rotary joint has been made, in view of the above-mentioned problem. The aspect relates to a rotary joint comprising a rotating body adapted to rotate on a rotating axis, a housing disposed so as to surround the

rotating body, and at least one bearing disposed between the rotating body and the housing and adapted to support rotation of the rotating body, the rotary joint being capable of supplying fluids through fluid passages formed inside the rotating body to a polishing table having attached thereto a polishing pad for polishing a substrate, or a holding portion that is adapted to hold the substrate while pressing the substrate against the polishing pad, wherein at least one elastic member is interposed at least either between the rotating body and the at least one bearing or between the housing and the at least one bearing.

[0012] According to another embodiment of the rotary joint, a groove extending along a rotating direction of the rotating body may be formed in an outer surface of the rotating body at a position which is opposed to the at least one bearing. The at least one elastic member may be an O-ring disposed in the groove.

[0013] According to still another embodiment of the rotary joint, the rotating body may be a shaft extending along the rotating axis. Fluid passages for circulation of the fluids may be formed inside the shaft so as to extend along the rotating axis.

[0014] According to still another embodiment of the rotary joint, fluids including at least pure water may be circulated through the fluid passages. The shaft may be made of resin.

[0015] According to still another embodiment of the rotary joint, the at least one bearing comprises a pair of bearings disposed at opposite end portions of the rotating body. Restricting portions may be formed in the housing, the restricting portions being adapted to abut against the pair of bearings to thereby restrict movement of the pair of bearings towards each other along the rotating axis. The rotary joint may further include a pair of flanges disposed at opposite end portions of the housing and adapted to press the pair of bearings against the restricting portions.

[0016] A polishing apparatus according to another aspect comprises a polishing table having attached thereto a polishing pad for polishing a substrate, a holding portion adapted to hold the substrate while pressing the substrate against the polishing pad, and the rotary joint of any one of the above embodiments, which is adapted to