

PIEZOELECTRIC AND/OR ELECTROSTRICTIVE ACTUATOR

ABSTRACT

A piezoelectric and/or electrostrictive actuator including a ceramic substrate and piezoelectric and/or electrostrictive elements is disclosed. The ceramic substrate includes: a spacer plate having a plurality of windows which provide pressure chambers, the windows being formed in a row in the longitudinal direction of the spacer plate; a closure plate superposed on one of opposite major surfaces of the spacer plate so as to close one of opposite openings of each window; and a connecting plate superposed on the other major surface of the spacer plate so as to close the other opening of each window. The piezoelectric and/or electrostrictive elements are disposed on respective portions of the outer surface of the closure plate in alignment with the respective pressure chambers. The spacer plate has auxiliary windows formed adjacent to respective two outermost windows which are located at opposite ends of the row, the auxiliary windows providing dummy cavities within the ceramic substrate such that the dummy cavities are formed adjacent to respective two outermost pressure chambers, while displacement adjusting layers are integrally formed on respective portions of the outer surface of the closure

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plate which correspond to the auxiliary windows giving the dummy cavities.

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