

FLUID JET DISPENSER USING MULTILAYER CERAMIC ACTUATORS

ABSTRACT

[0001] A fluid jet dispenser using at least two multilayer piezoelectric actuators is provided. The fluid jet dispenser includes a dispensing head and an electrical driver. The dispensing head includes at least two d_{31} -mode multilayer piezoelectric actuators, a displacement magnifying element mechanically coupled to the d_{31} -mode multilayer piezoelectric actuators, a piston, and a nozzle. More preferably, the two d_{31} -mode multilayer piezoelectric actuators operate in an anti-phase condition. The electrical driver is electrically coupled to the d_{31} -mode multilayer piezoelectric actuators for displacing the actuators in directions substantially perpendicular to polarization of piezoelectric layers in the d_{31} -mode multilayer piezoelectric actuators in response to charging and discharging of the actuators by the electrical driver, to generate a fast movement of the piston to jet a pressurized fluid out of the nozzle of the dispensing head.

FIG. 11