

ABSTRACT

WEDGE DEVICE FOR LINEAR FORCE AMPLIFICATION IN A PRESS

A wedge device for a press for controllably exerting high amounts of force in a clamping operation during a semiconductor packaging process and for facilitating a linear force output in relation to its input. The wedge device is powered by a servo motor which is coupled to a planetary screw by a set of pulleys and a timing belt. The screw is mated with a nut which is prevented from rotating so that the rotation of the screw causes the nut to move in a linear direction. Metal extensions join the nut to a bottom wedge such that the wedge moves together with the nut. Slidably disposed on top of the bottom wedge is a block bearing firmly attached to a complementary wedge. The complementary wedge is free to move in a vertical direction but not in a horizontal direction. As the bottom wedge moves in a horizontal direction, the complementary wedge moves in a vertical direction. The complementary wedge is placed underneath a press to provide the clamping force necessary for a semiconductor packaging operation.

FIG. 2