

ABSTRACT

PROJECTION OPTICAL DEVICE AND EXPOSURE APPARATUS

A projection optical device includes a projection optical system which projects an image of a pattern, a support device having a flexible structure to support the projection optical system, and a positioning device having an actuator to position the projection optical system. The projection optical device can include a frame to which one end of the flexible structure is attached. The projection optical system may hang from the frame via the support device, or it may be supported from below by the support device. A projection optical device also can include a liquid supply which supplies a temperature-controlled liquid to a side surface of a projection optical system utilizing gravity to cause the temperature-controlled liquid to flow along the side surface of the projection optical system.

(Figure 1)