

ABSTRACT

A casting ingot furnace for directional solidification growth of crystalline silicon is provided. The casting ingot furnace includes a furnace body, a supporter, a protective plate, a thermal insulation cage, and a heater. The furnace body includes an upper furnace body and a lower furnace body engaged with the upper furnace body, and the lower furnace body defines a shaft hole at a bottom of the lower furnace body. The supporter includes a rotating shaft and a heat exchanger fixed to an end of the rotating shaft, and a crucible is disposed on the heat exchanger. The other end of the rotating shaft extends through the shaft hole to be coupled with a driving device disposed outside the lower furnace body, and the driving device is configured to drive the rotating shaft to rotate, whereby enabling the crucible to rotate. The rotating shaft defines a coolant circulating passage for introducing and circulating coolant to achieve circulating cooling of the rotating shaft. Uniform heating for the crucible is achieved through the casting ingot furnace, such that a problem that a large number of uneven growth interfaces exist on each side of the silicon ingot can be effectively resolved, red zones at a tail portion (for example, a lower end) of the silicon ingot are significantly reduced, thereby improving quality and yield of the silicon ingot. An application of the casting ingot furnace is also provided according to the present disclosure.

Fig. 1