

ABSTRACT

A secondary cooling apparatus capable of gradually cooling cast thin pieces and a cast apparatus that uses it are provided. A comb tooth-shaped device 50 is arranged inside a vessel 40 of the secondary cooling apparatus 22; the cast thin pieces 71 are piled on the comb tooth-shaped device 50; and crushed small pieces 72 are placed thereon. After the cast thin pieces 71 and the crushed small pieces 72 are gradually cooled, the cast thin pieces 71 are crushed by a pressing device 60. The crushed small pieces 72 are rapidly cooled by being in contact with a surface of a bottom wall 42 and side faces of cooling teeth 51_1 , 51_2 , ---, 51_n . Nd-rich phases or R-rich phases can be annealed by the gradual cooling, and after the crushed small pieces 72 are rapidly cooled to its oxidation temperature or below, the crushed small pieces can be taken out to the air atmosphere.