MANUFACTURING METHOD AND MANUFACTURING APPARATUS OF CRYSTAL SEMICONDUCTOR FILM

Abstract

In order to prevent occurrence of irradiation unevenness when a non-single-crystal semiconductor film is crystallized by irradiation of a pulse laser, with an irradiation pulse energy density which is lower than an irradiation pulse energy density with which microcrystallization occurs to the non-single-crystal semiconductor film by irradiation of the pulse laser, and is suitable for crystallization by irradiation of a plurality of times N being set as E0, a first step of irradiating with the pulse laser having an irradiation pulse energy density E1 which is the same as the irradiation pulse energy density E0, and a second step of irradiating with the pulse laser having an irradiation pulse energy E2 which is lower than the irradiation pulse energy density E1, and is equal to or higher than an irradiation energy density that is necessary for a crystal to be remelted are included, and the total number of irradiation times to the same irradiation surface in the first step and the second step is made equal to or larger than N times.

Fig. 6