photoelectron spectroscopy). Further, as a result of the measurement by XRD (X-ray diffractometer), the crystallinity of the absorption layer 14 was amorphous, although slight crystallinity was observed. The layer thickness of the absorption layer 14 was set to 33 nm. Next, a back surface conductive film 15 formed of chromium nitride (CrN) was formed on the surface on the opposite side to the surface on which the reflective layer 12 was formed of the substrate 11. The layer thickness of the back surface conductive film 15 was set to 100 nm.

[0039]

By the procedure above, the reflective photomask blank 100 of Example 1 was produced.

The film formation (formation of each layer) of each film (reflective layer 12, capping layer 13, and absorption layer 14) on the substrate 11 was performed using a multi-source sputtering apparatus. The layer thickness of each film was controlled by a sputtering time. The absorption layer 14 was formed such that the N/In ratio was 1.0 by controlling the amount of nitrogen introduced into a chamber during sputtering by a reactive sputtering method.

[0040]

Next, a method for producing a reflective photomask 200 is described with reference to FIGS. 5 to 8.

First, a positive chemically amplified resist (SEBP9012: manufactured by Shin-Etsu Chemical Co., Ltd.)