



(12) **United States Patent**
Ando et al.

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(54) **METHOD FOR FORMING THIN FILMS**

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(65) **Prior Publication Data**

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**
B32B 9/04 (2006.01)

(52) **U.S. Cl.** **428/696; 428/689; 428/702**

(58) **Field of Classification Search** 428/432,
428/469, 689, 696, 702; 204/192.15, 192.16

See application file for complete search history.

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(57) **ABSTRACT**

The present invention provides a method for forming a film of aluminum oxide in which a target containing aluminum is sputtered in a gas containing fluorine atoms.

The thin film of aluminum oxide according to the present invention has little optical absorption and high refractive index in the ultraviolet and vacuum ultraviolet regions.

3 Claims, 5 Drawing Sheets

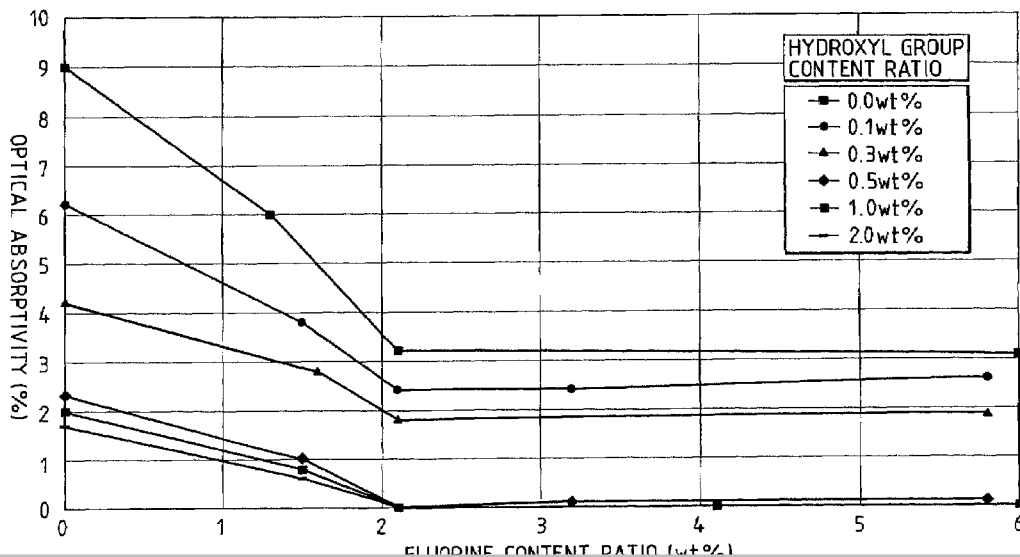


FIG. 1

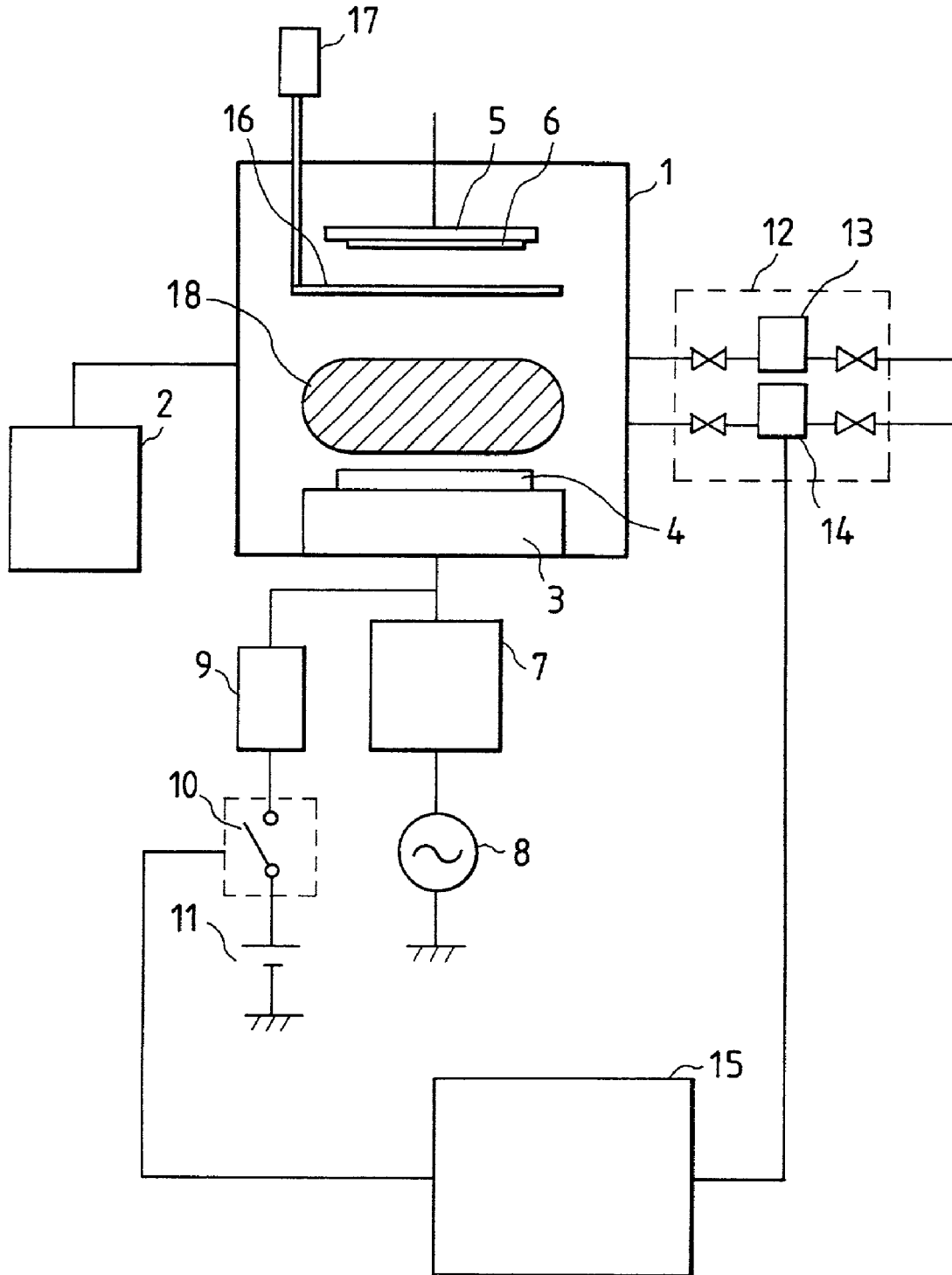


FIG. 2

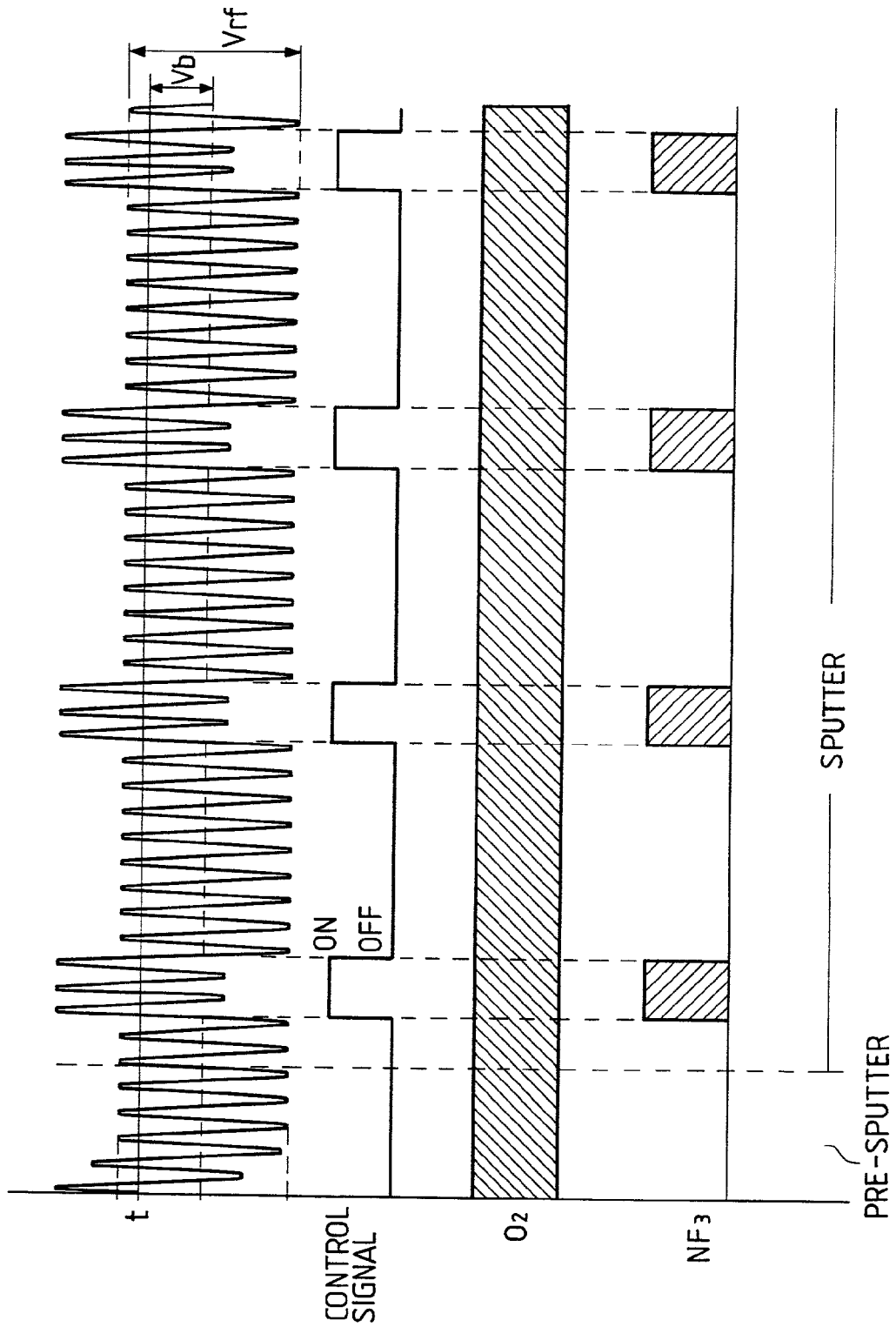


FIG. 3

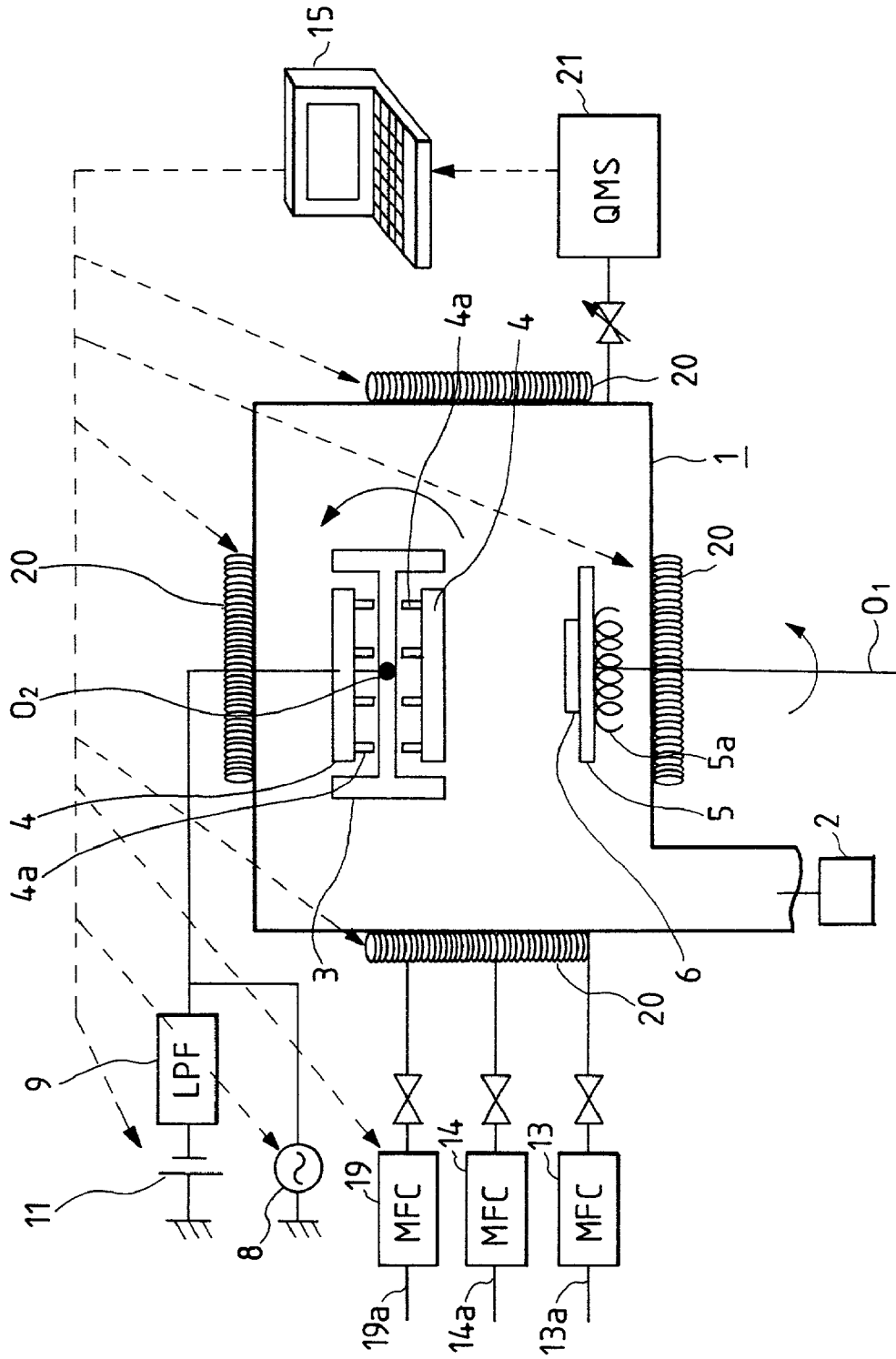
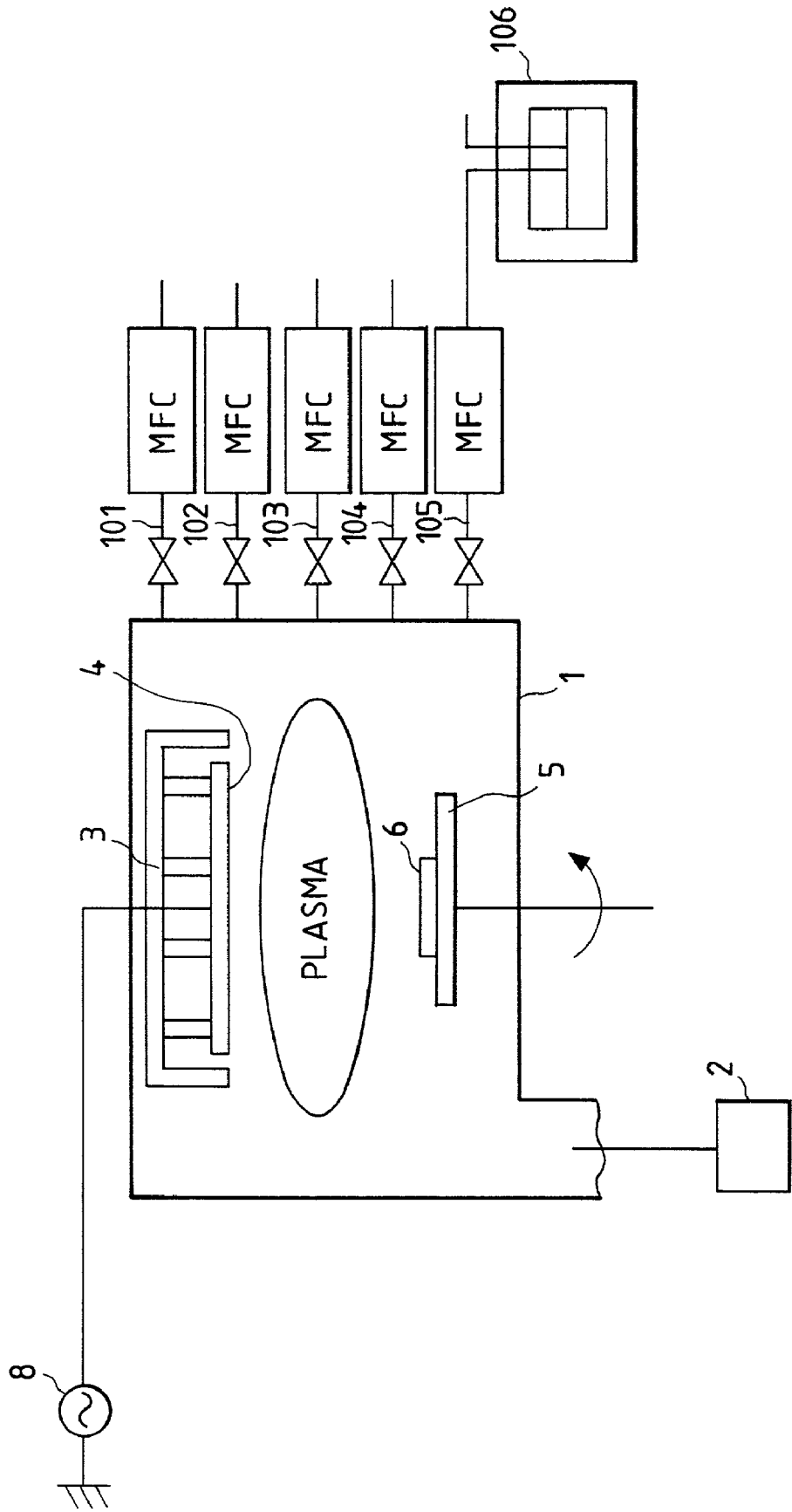


FIG. 4



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