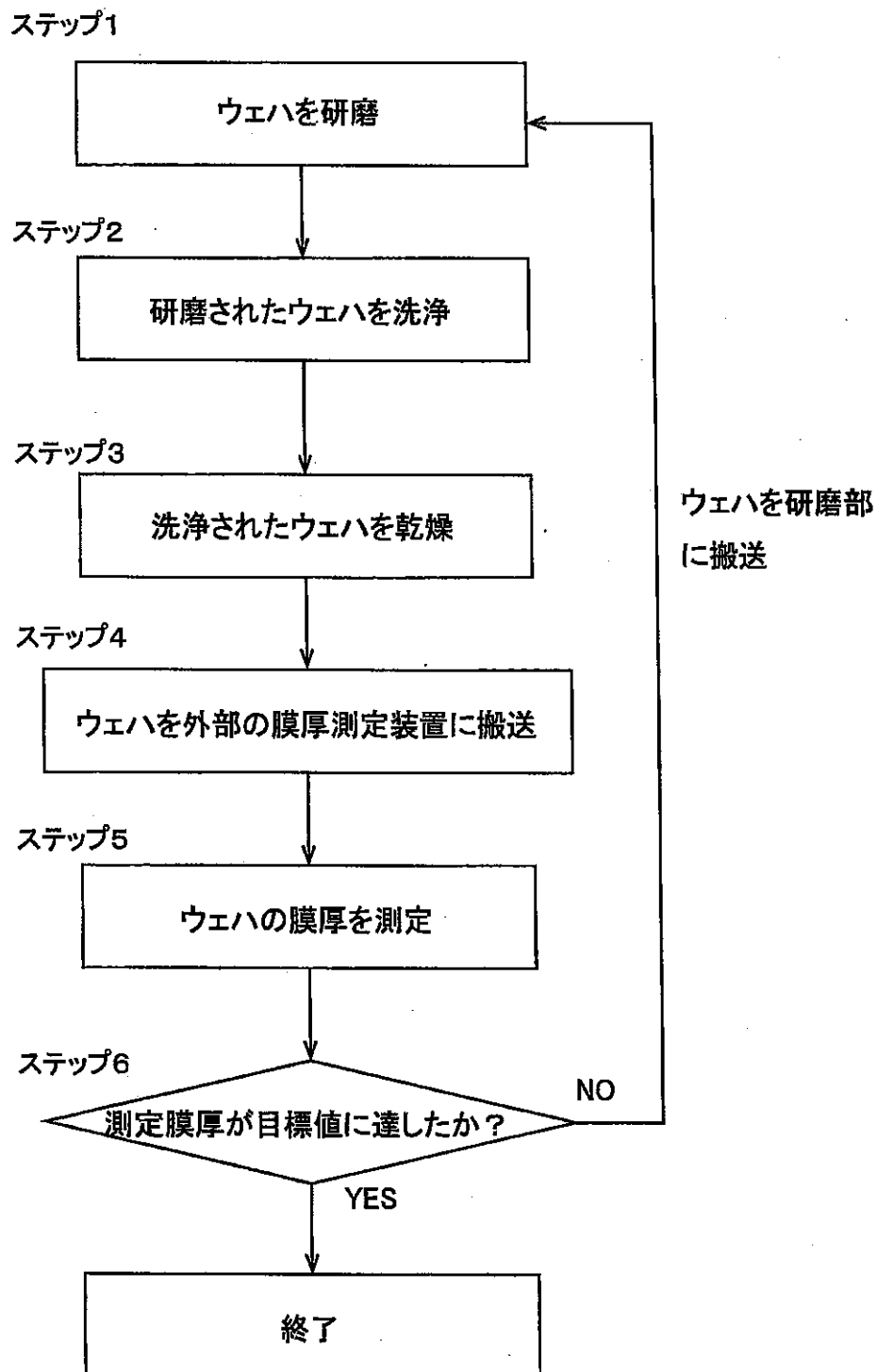
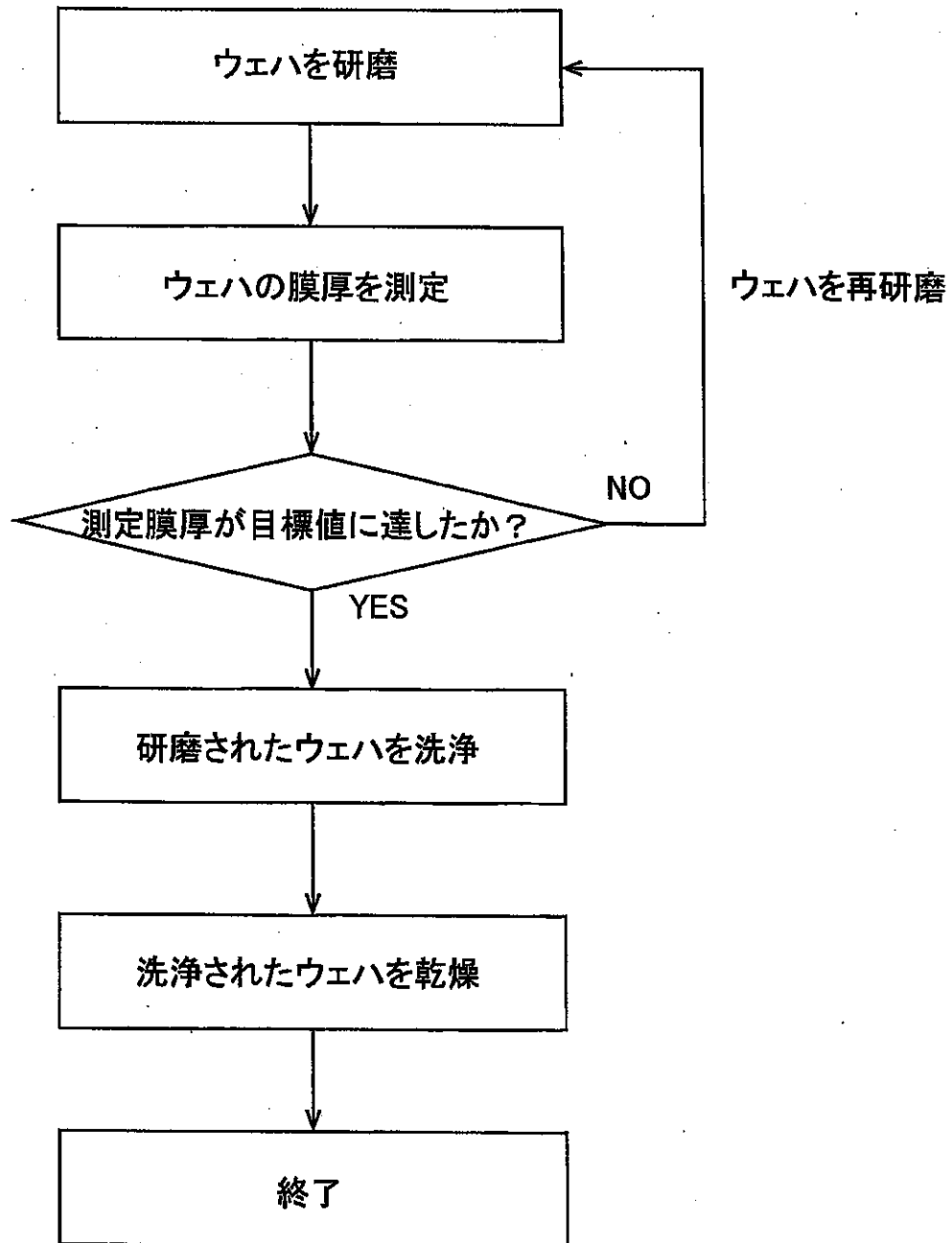


FIG. 1



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FIG. 2



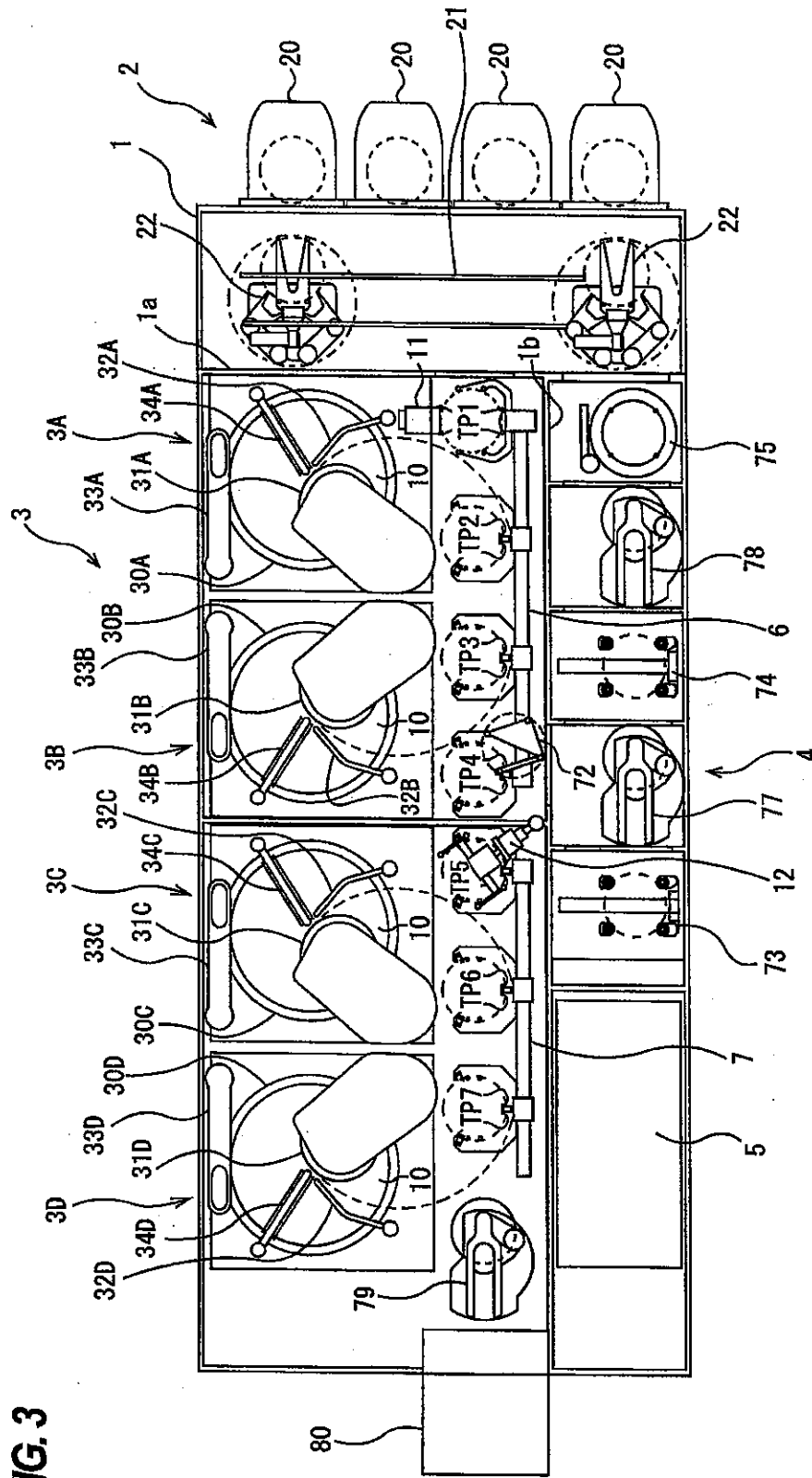


FIG. 3

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FIG. 4

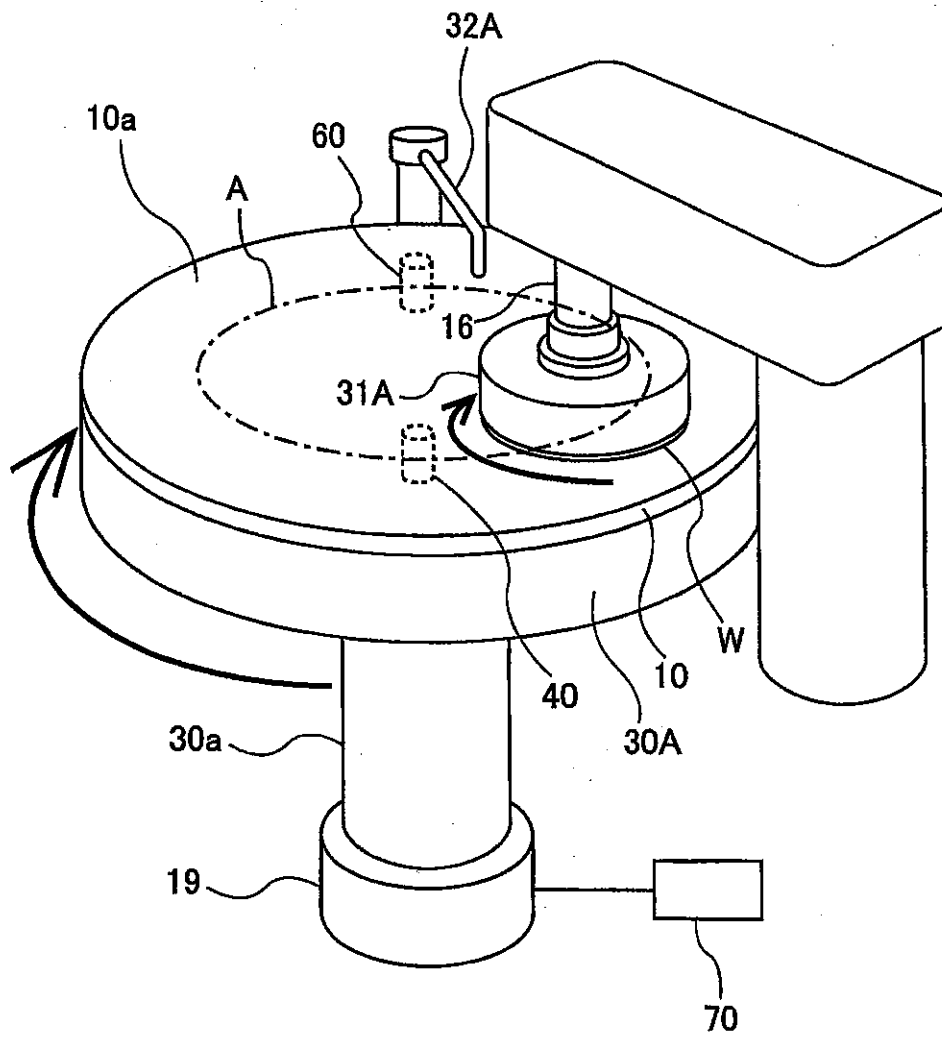


FIG. 5

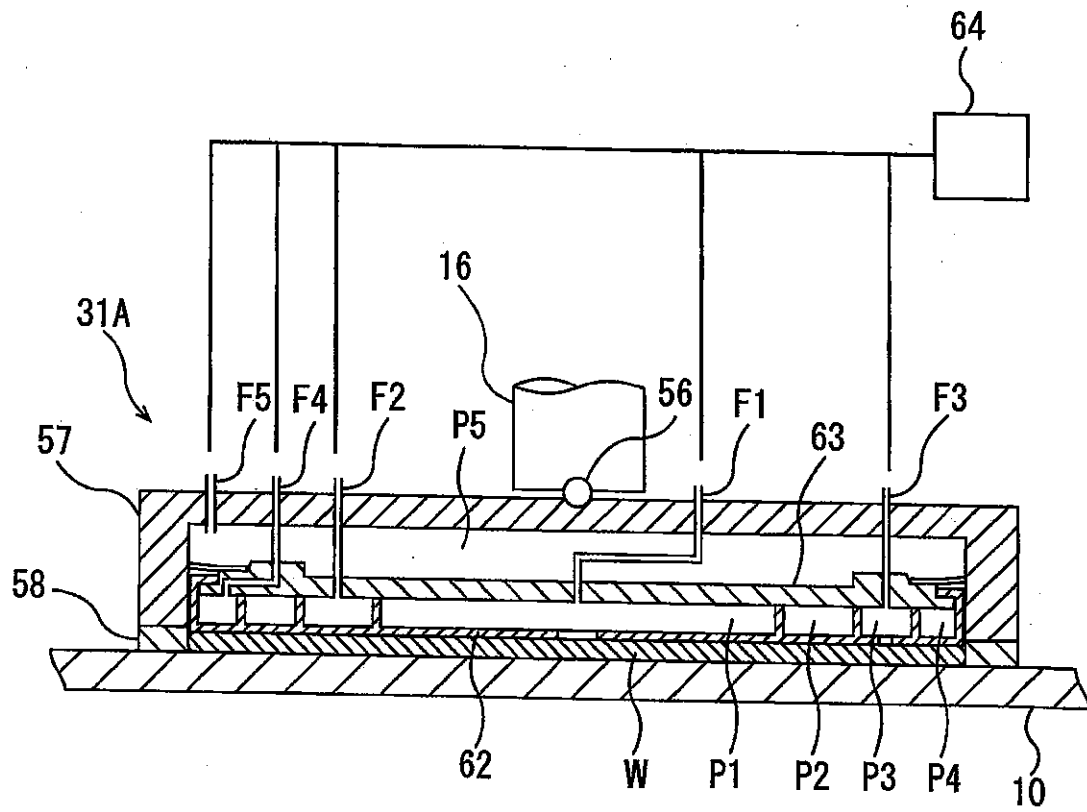


FIG. 6A

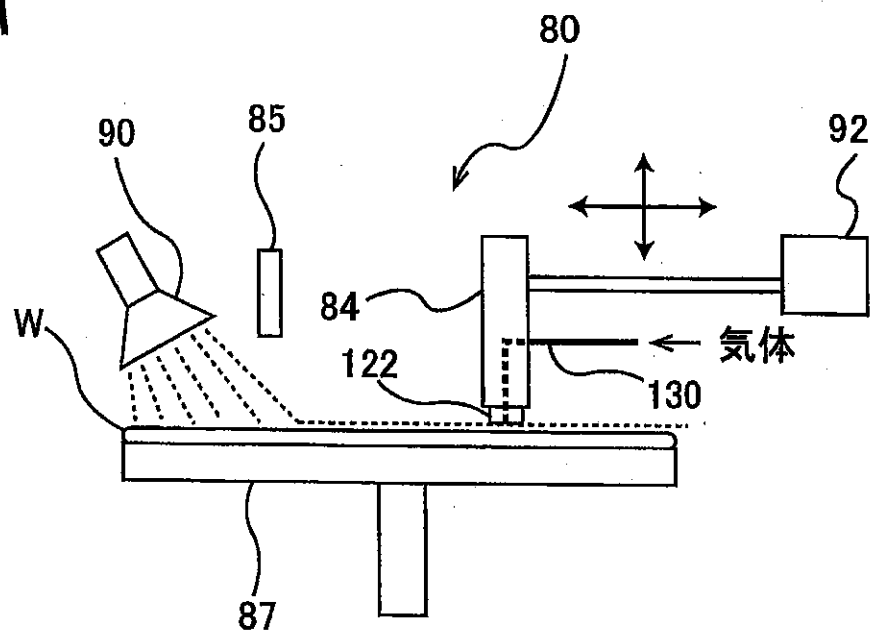
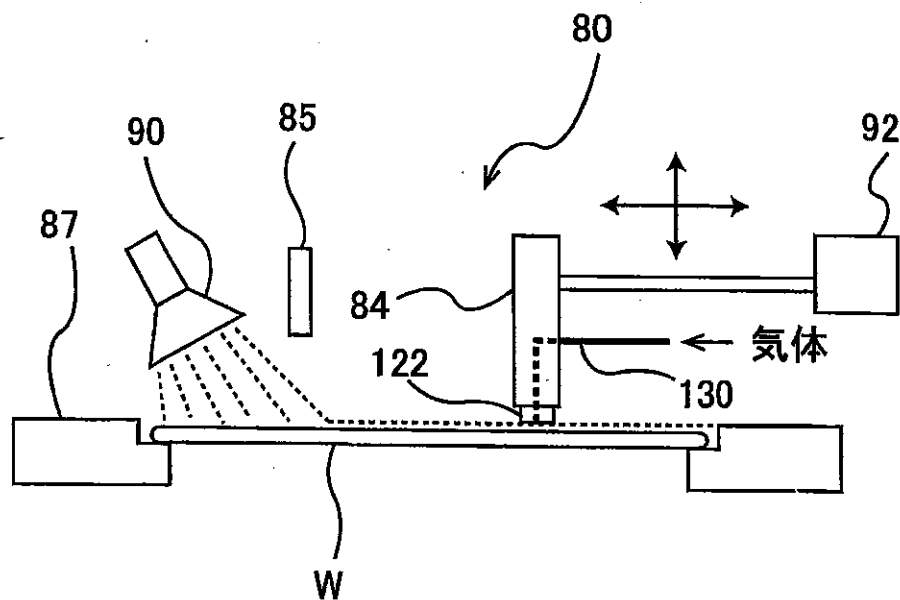
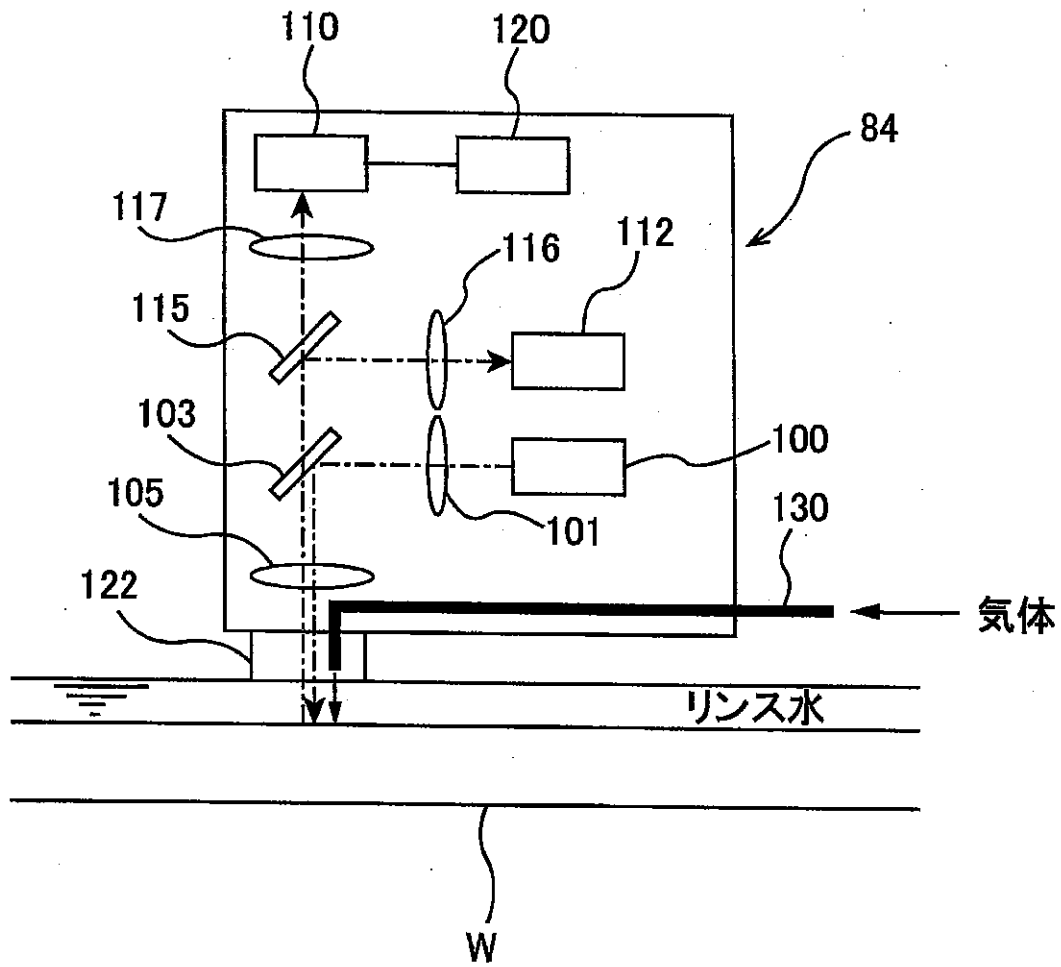


FIG. 6B



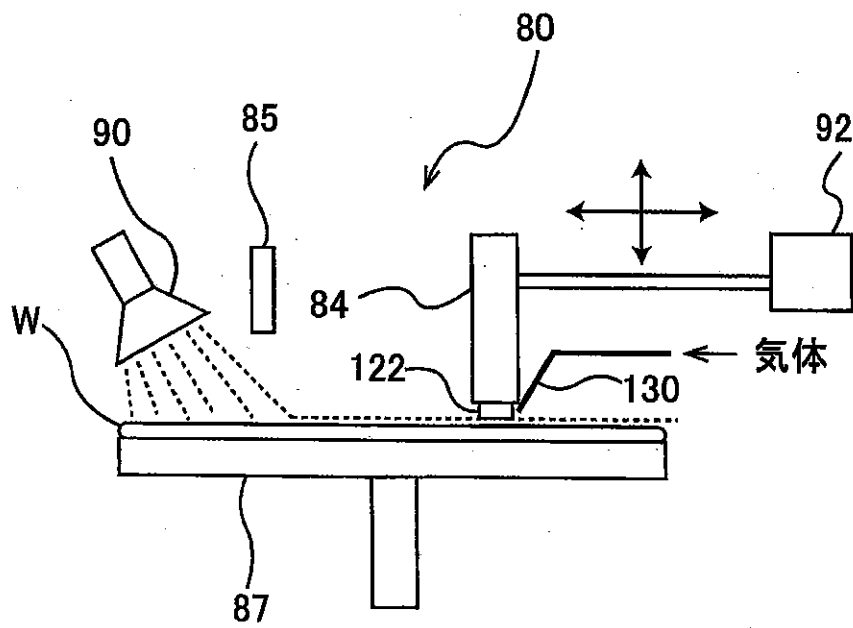
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FIG. 7



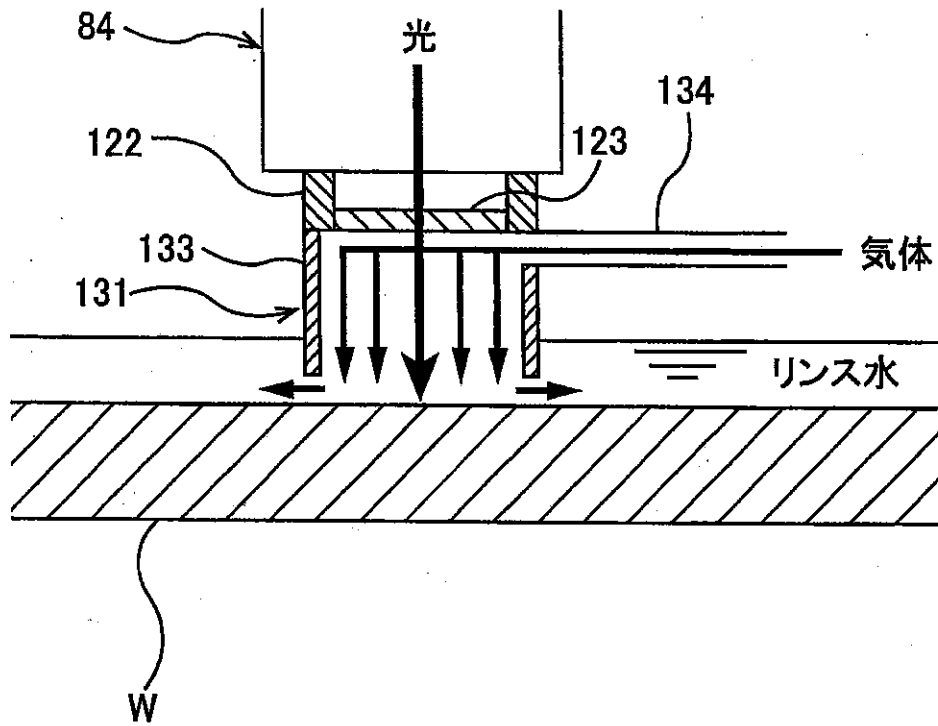
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FIG. 8

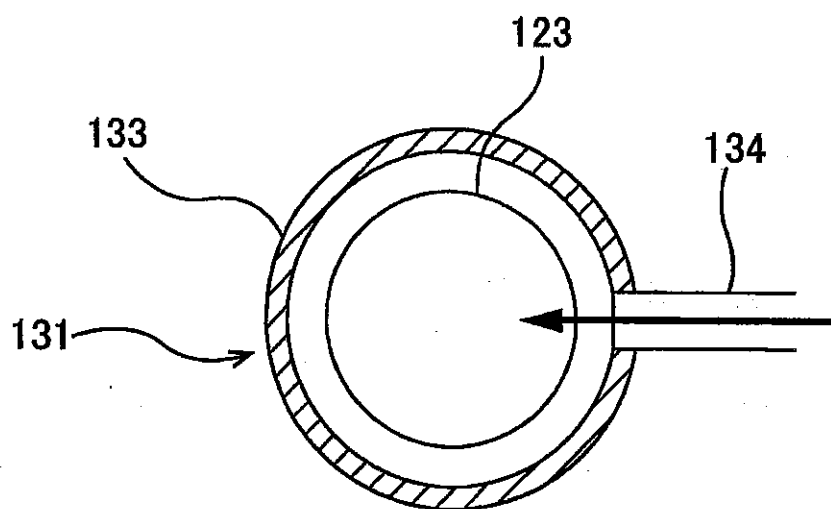


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FIG. 9

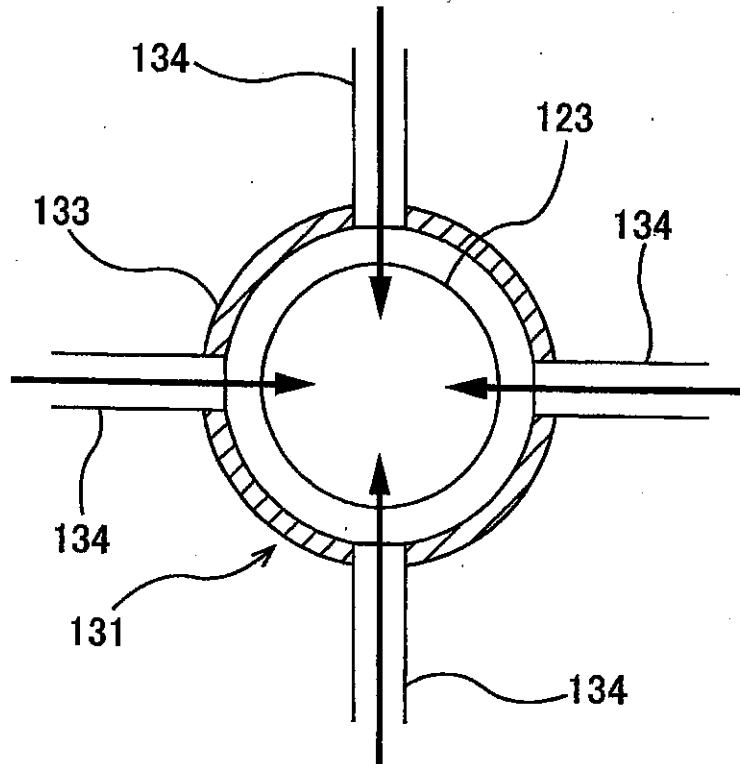


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FIG. 10



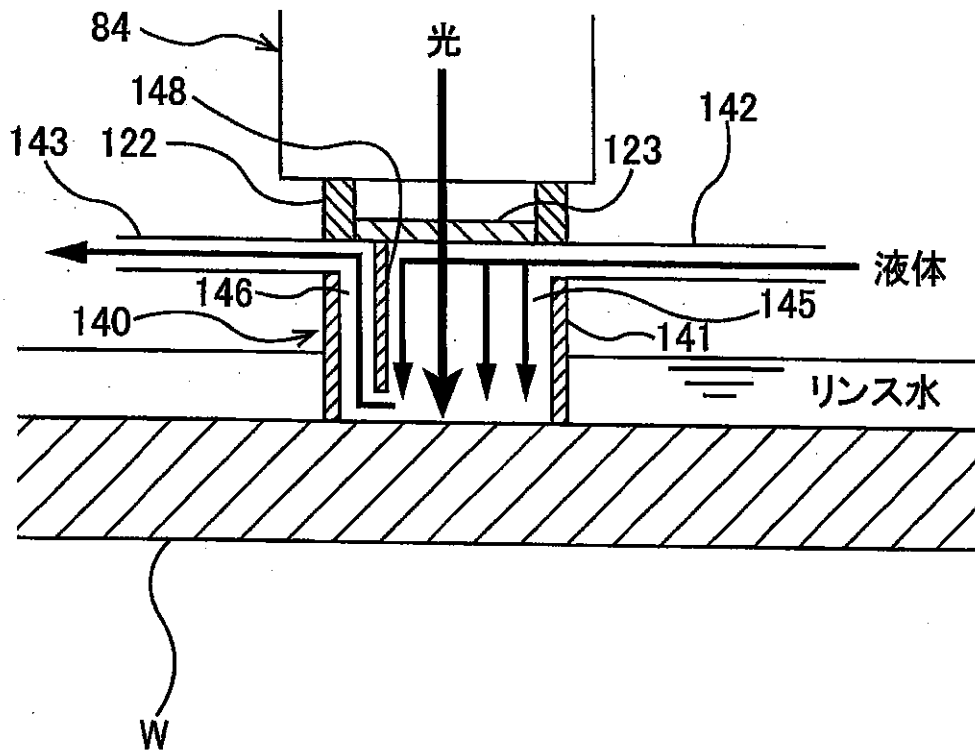
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FIG. 11



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FIG. 12



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FIG. 13

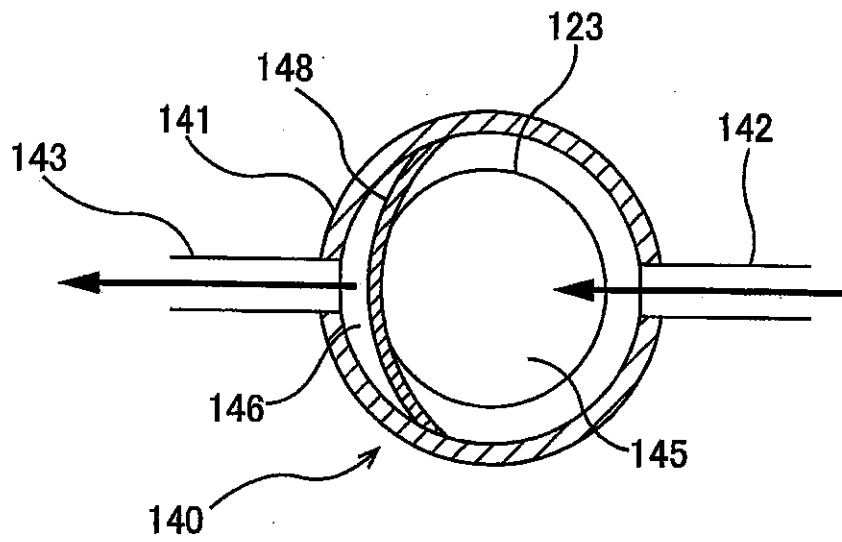
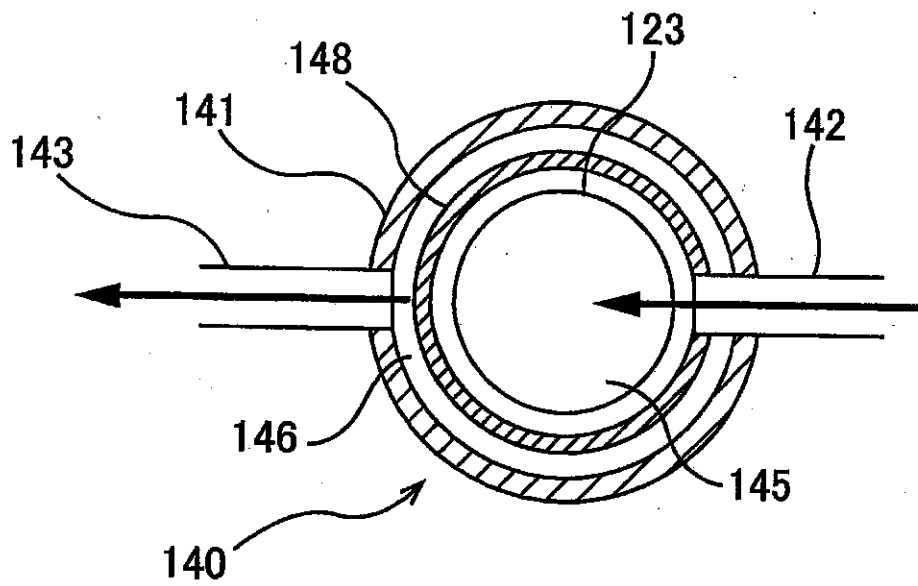
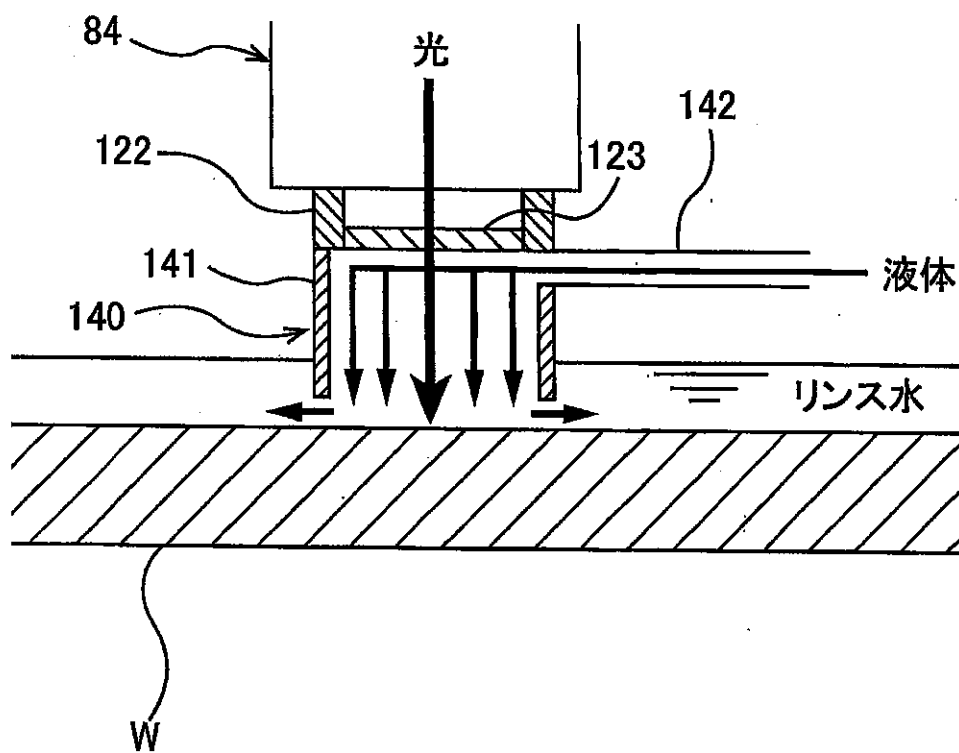


FIG. 14



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FIG. 15



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FIG. 16

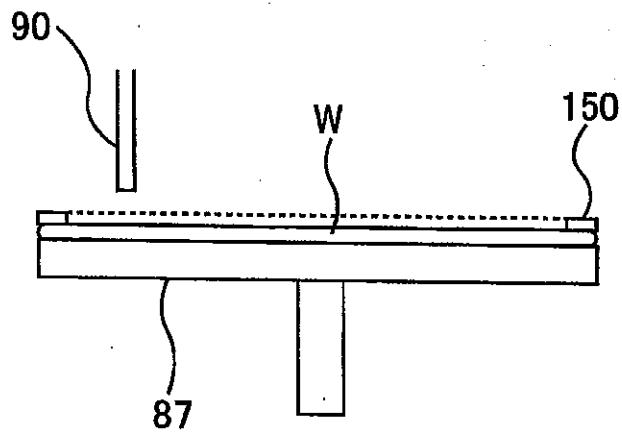
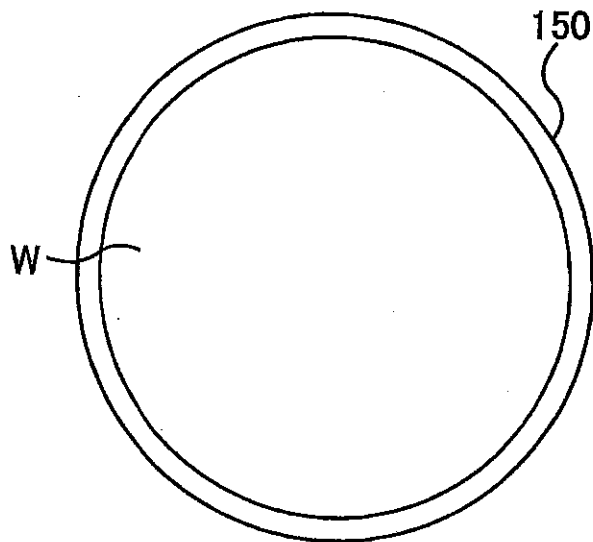


FIG. 17



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FIG. 18

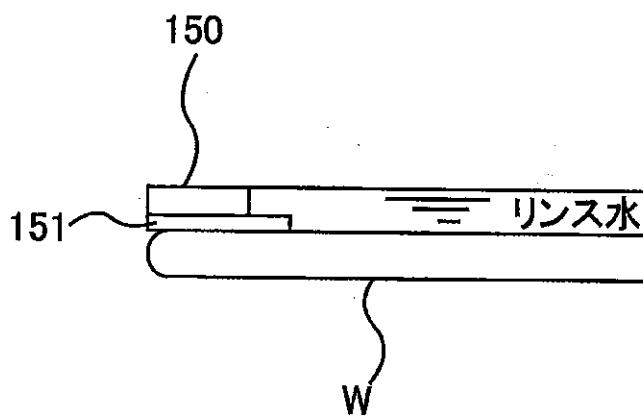
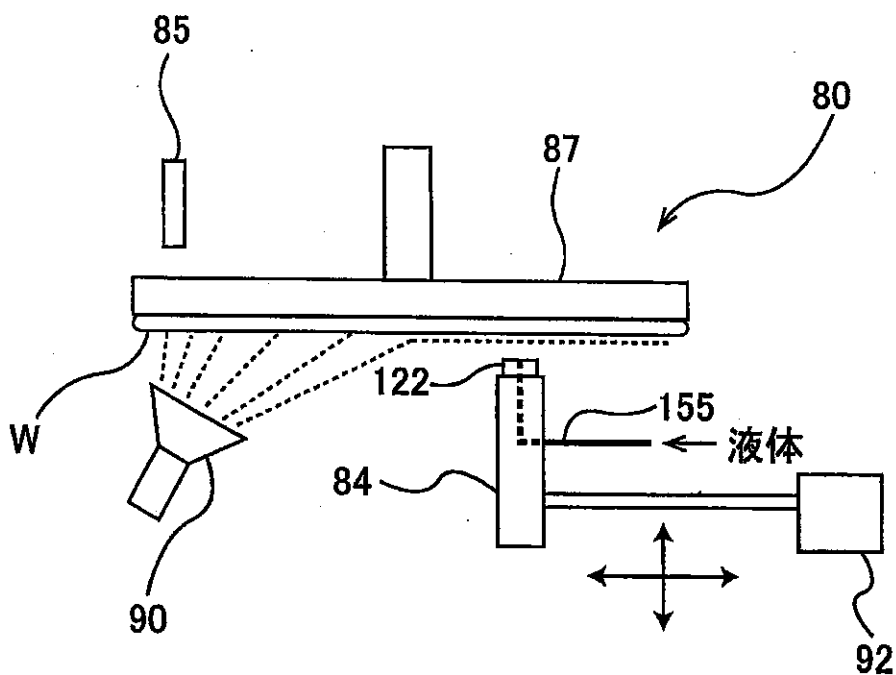


FIG. 19



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FIG. 20

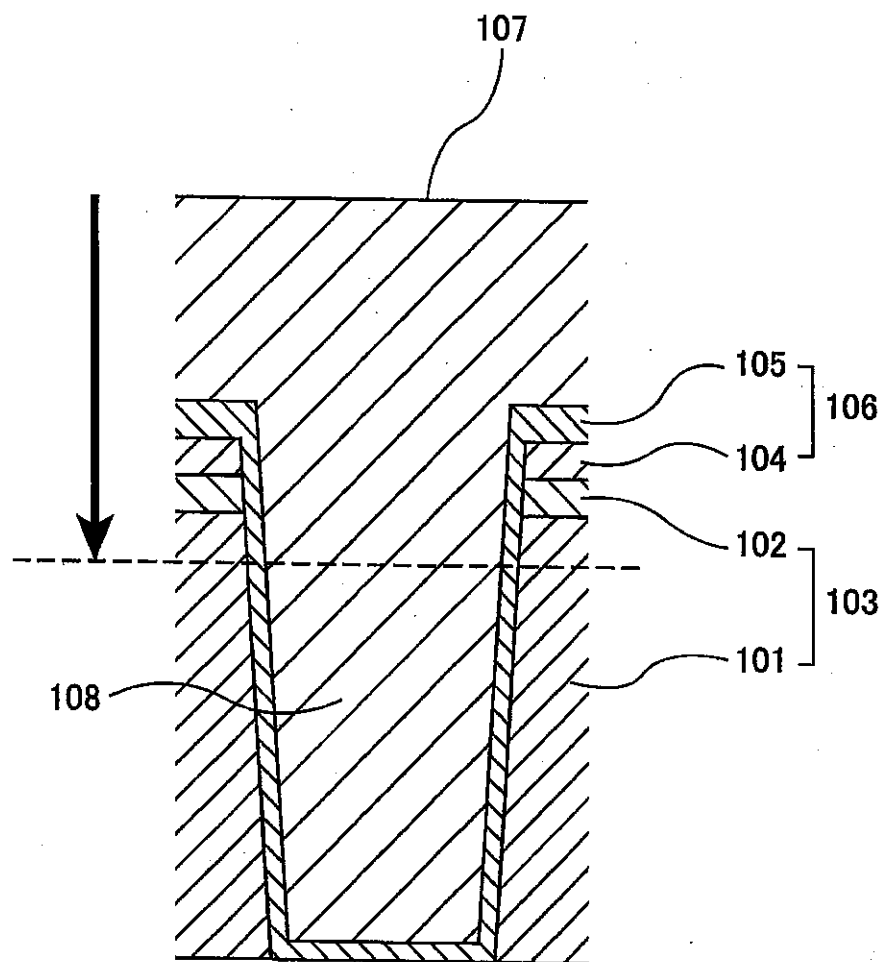


FIG. 21A

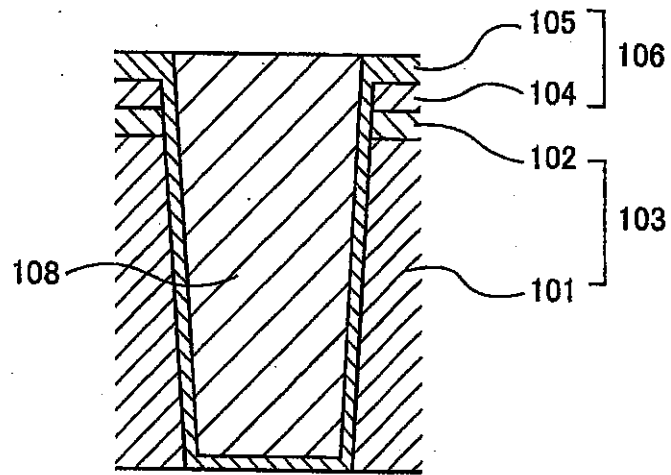
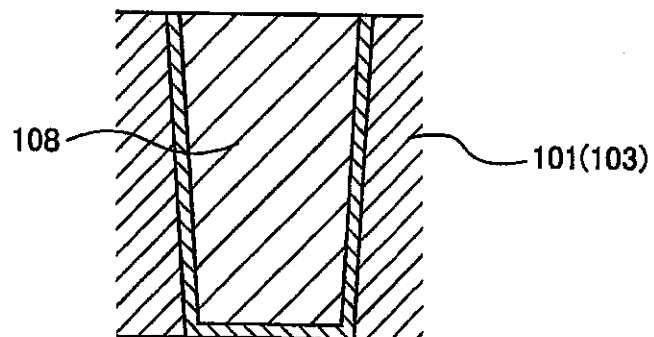


FIG. 21B



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FIG. 22

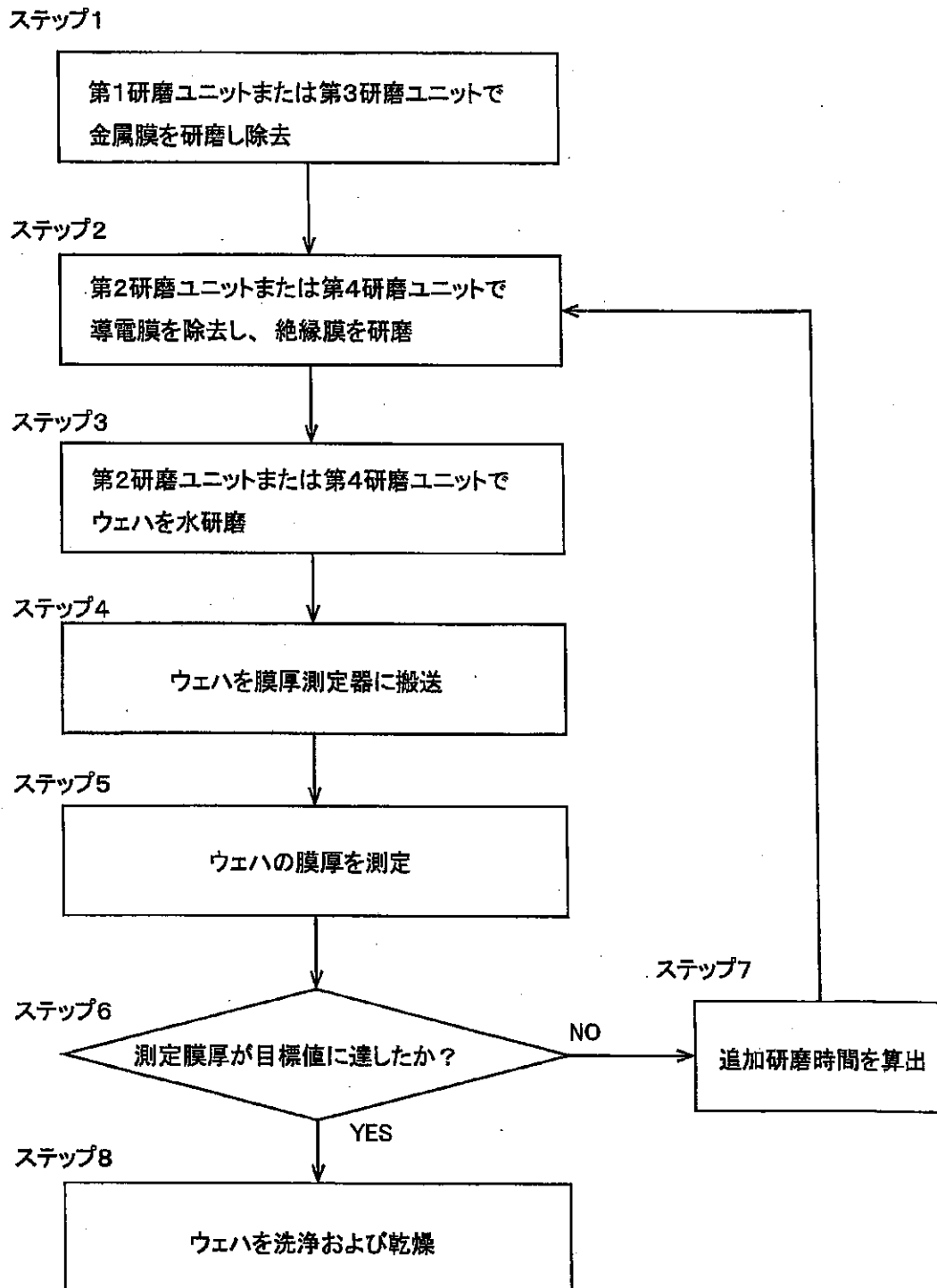
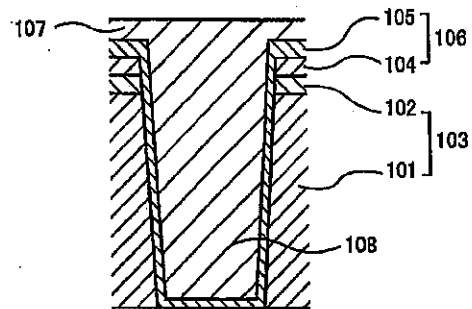
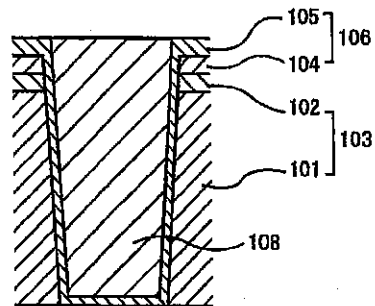


FIG. 23A

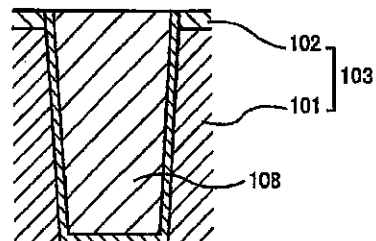
銅膜 107 を研磨

**FIG. 23B**

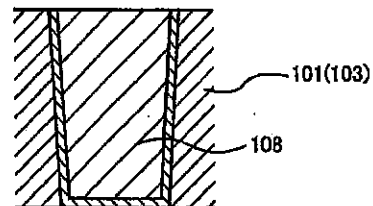
銅膜 107 を除去

**FIG. 23C**

バリア膜 105 を除去
+
第2ハードマスク膜 104 を除去

**FIG. 23D**

第1ハードマスク膜 102 を除去
+
層間絶縁膜 101 を研磨



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FIG. 24

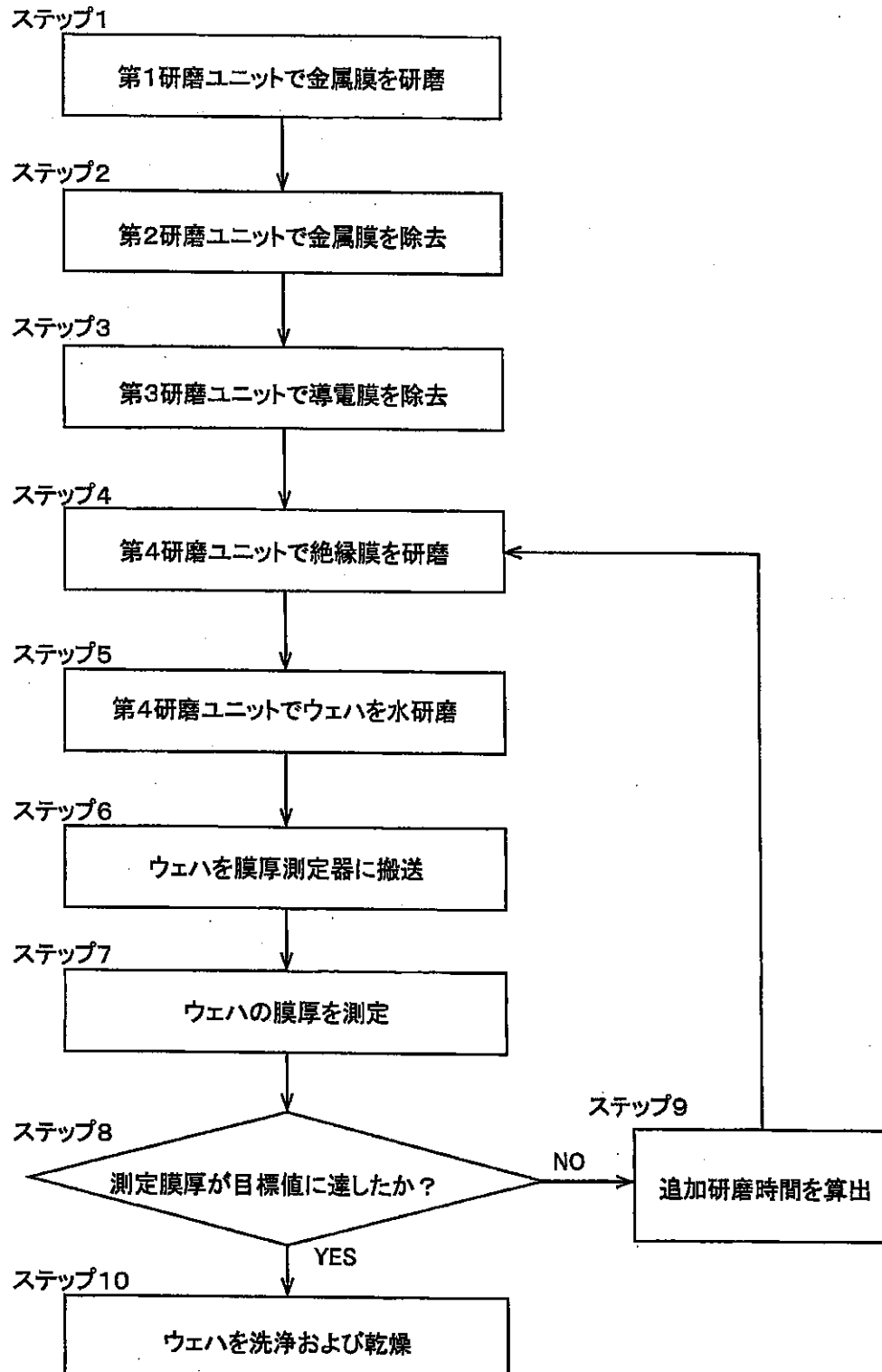


FIG. 25A

銅膜 107 を研磨

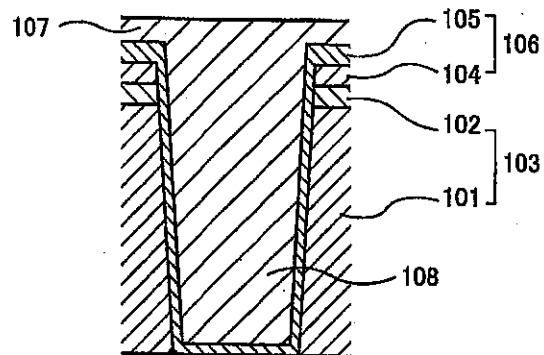


FIG. 25B

銅膜 107 を除去

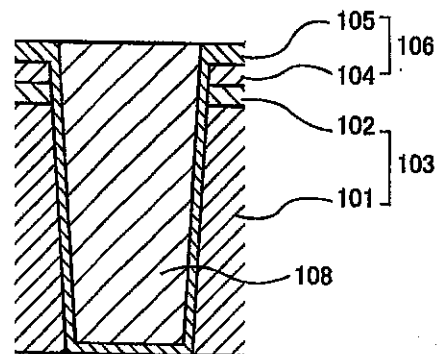


FIG. 25C

バリア膜 105 を除去
 +
 第2ハードマスク膜 104 を除去
 +
 第1ハードマスク膜 102 を研磨

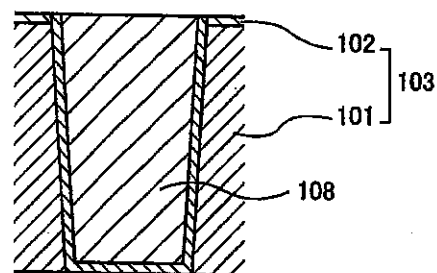


FIG. 25D

第1ハードマスク膜 102 を除去
 +
 層間絶縁膜 101 を研磨

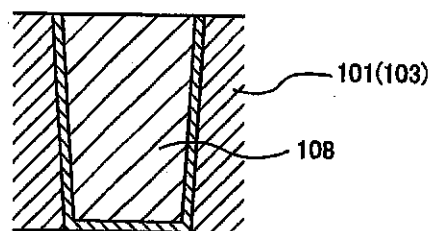
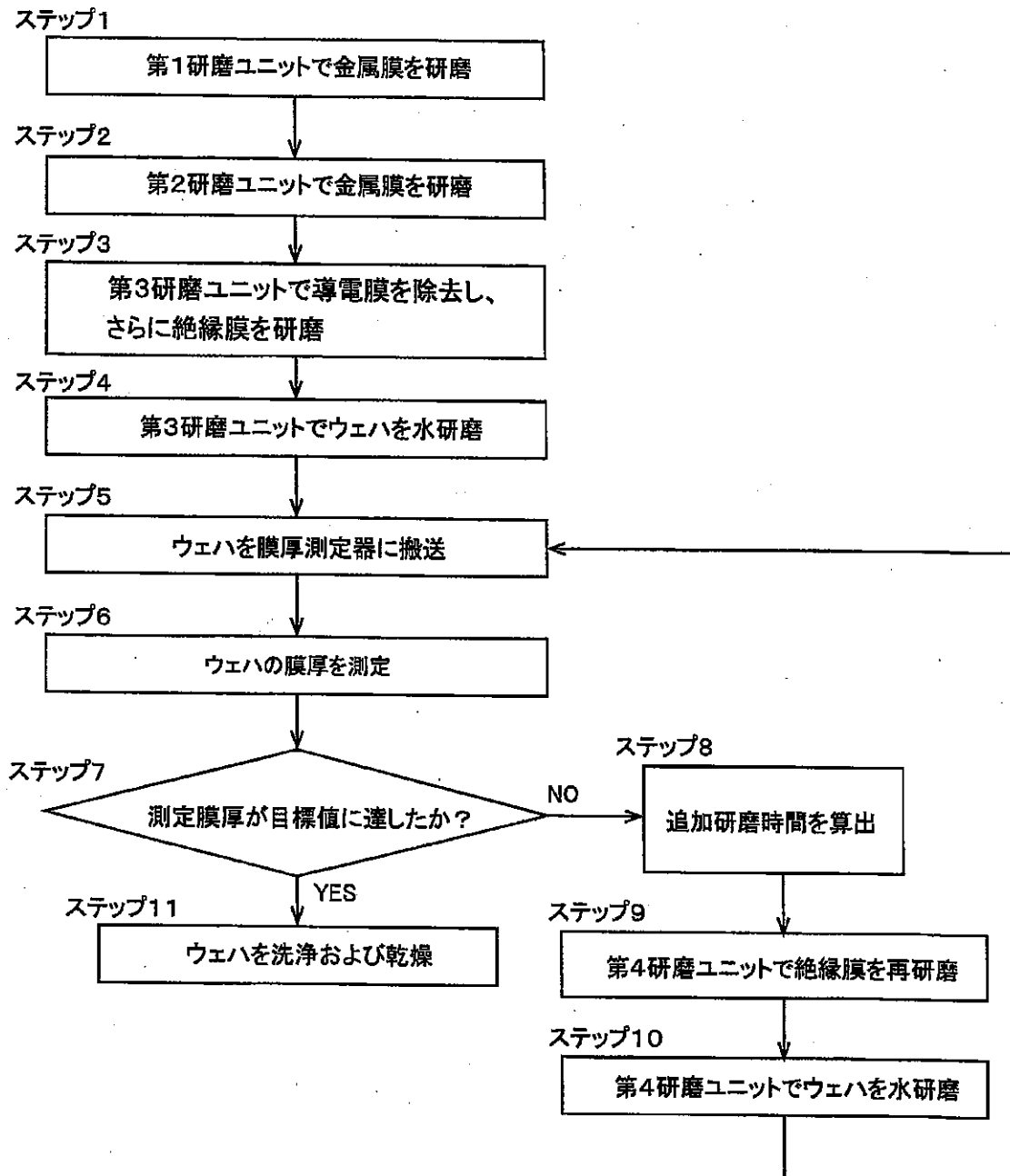


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FIG. 27

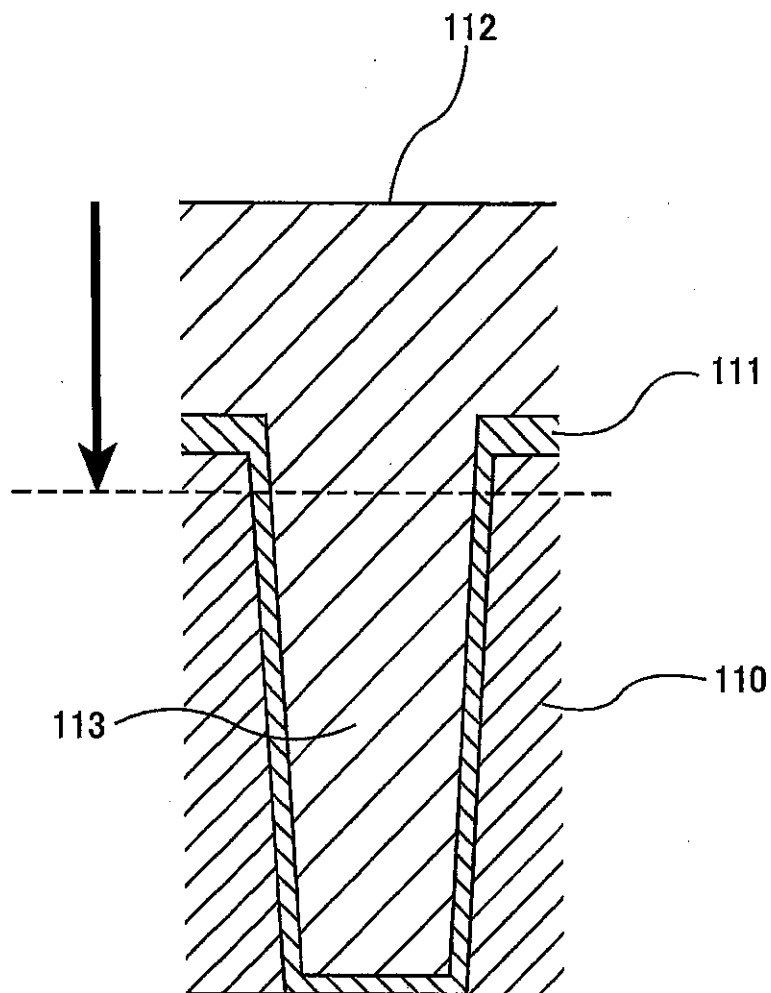


FIG. 28A

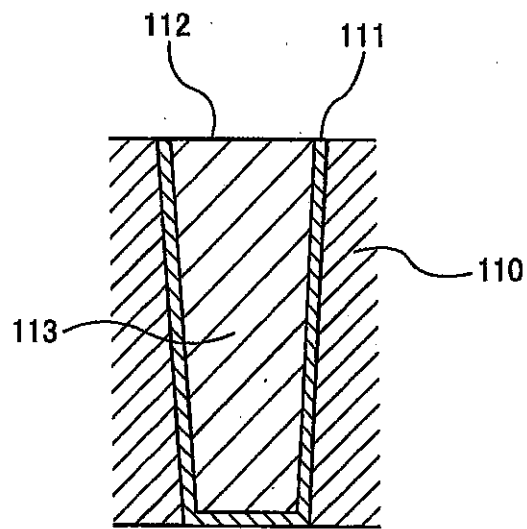


FIG. 28B

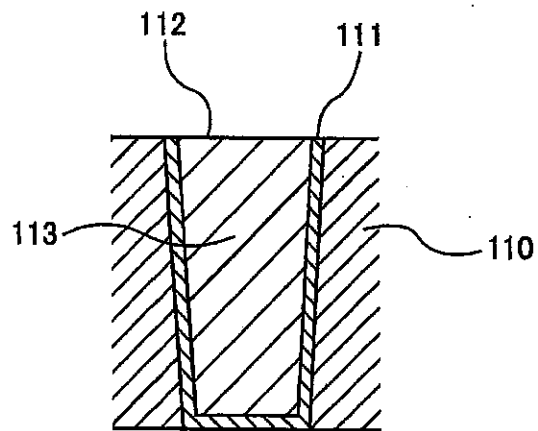


FIG. 29

ステップ1

第1研磨ユニットまたは第3研磨ユニットで
タングステン膜およびバリア膜を除去

ステップ2

第2研磨ユニットまたは第4研磨ユニットで
絶縁膜を研磨

ステップ3

第2研磨ユニットまたは第4研磨ユニットで
ウェハを水研磨

ステップ4

ウェハを膜厚測定器に搬送

ステップ5

ウェハの膜厚を測定

ステップ6

測定膜厚が目標値に達したか？

NO

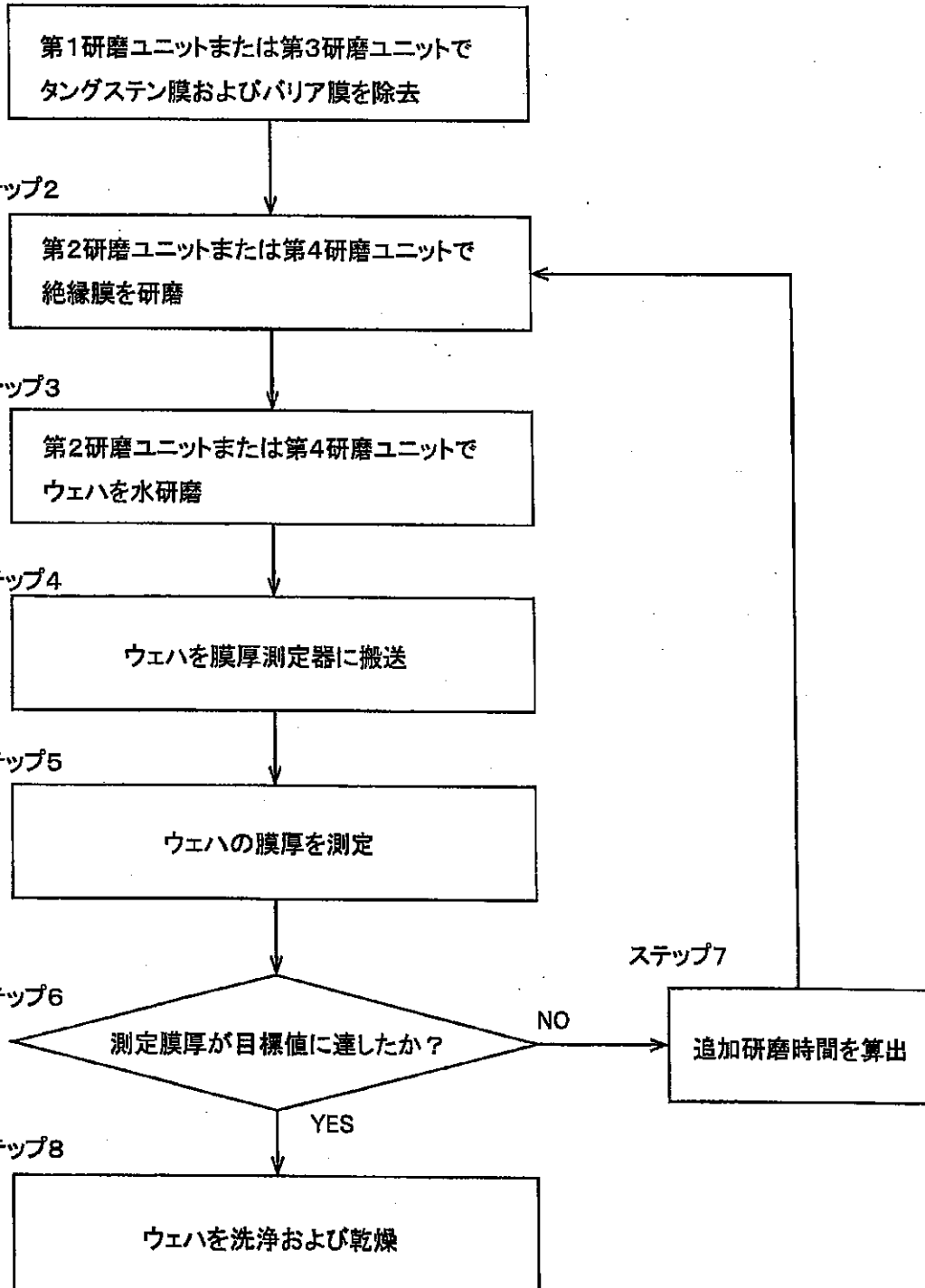
ステップ7

追加研磨時間を算出

YES

ステップ8

ウェハを洗浄および乾燥



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FIG. 30

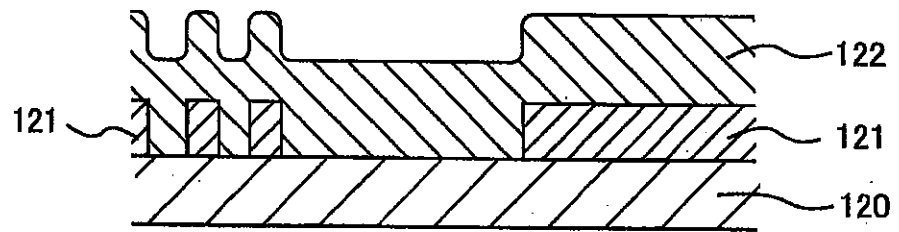


FIG. 31A

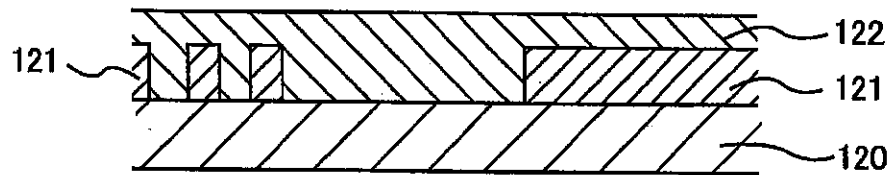


FIG. 31B

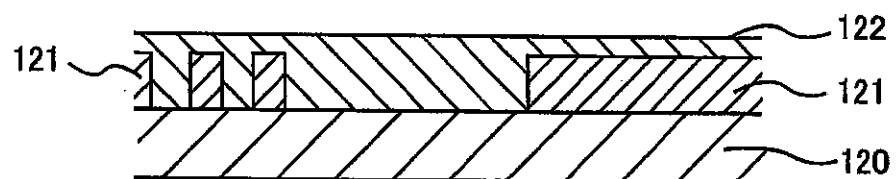
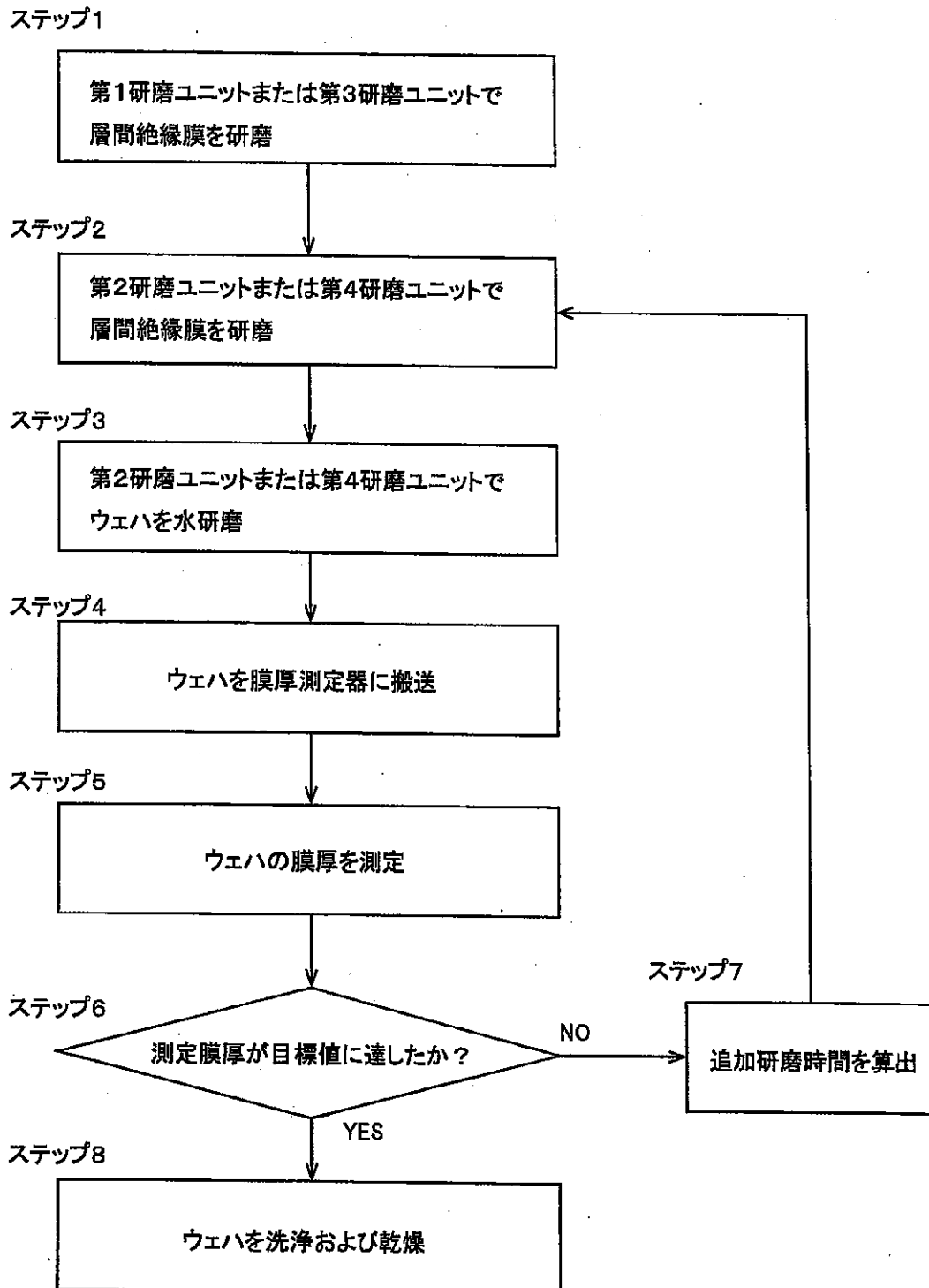


FIG. 32



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FIG. 33

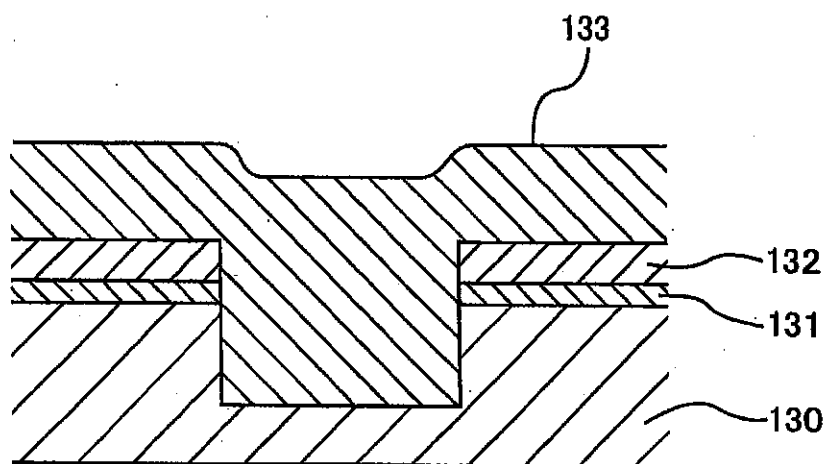


FIG. 34A

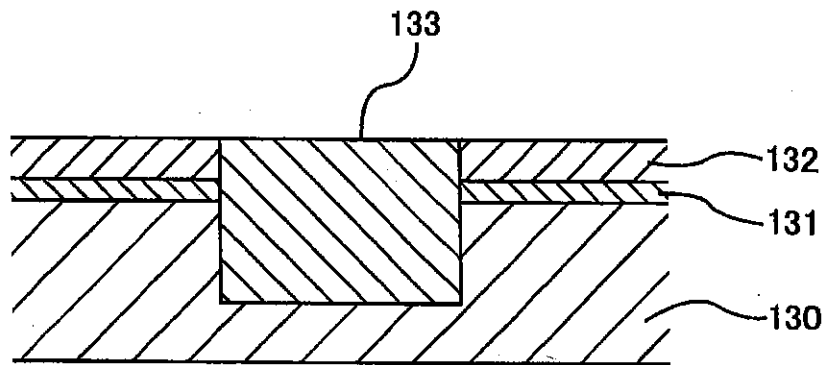
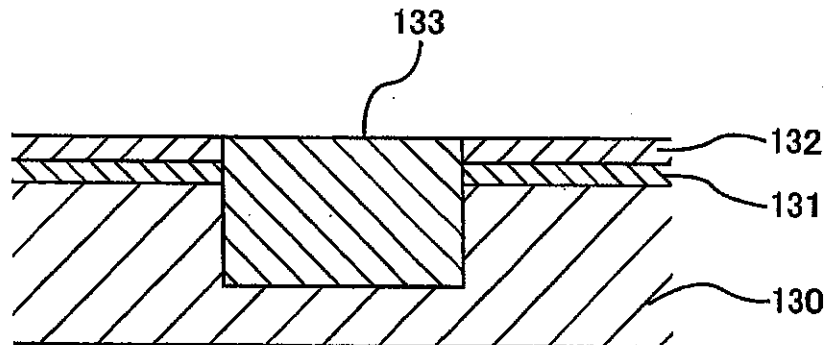
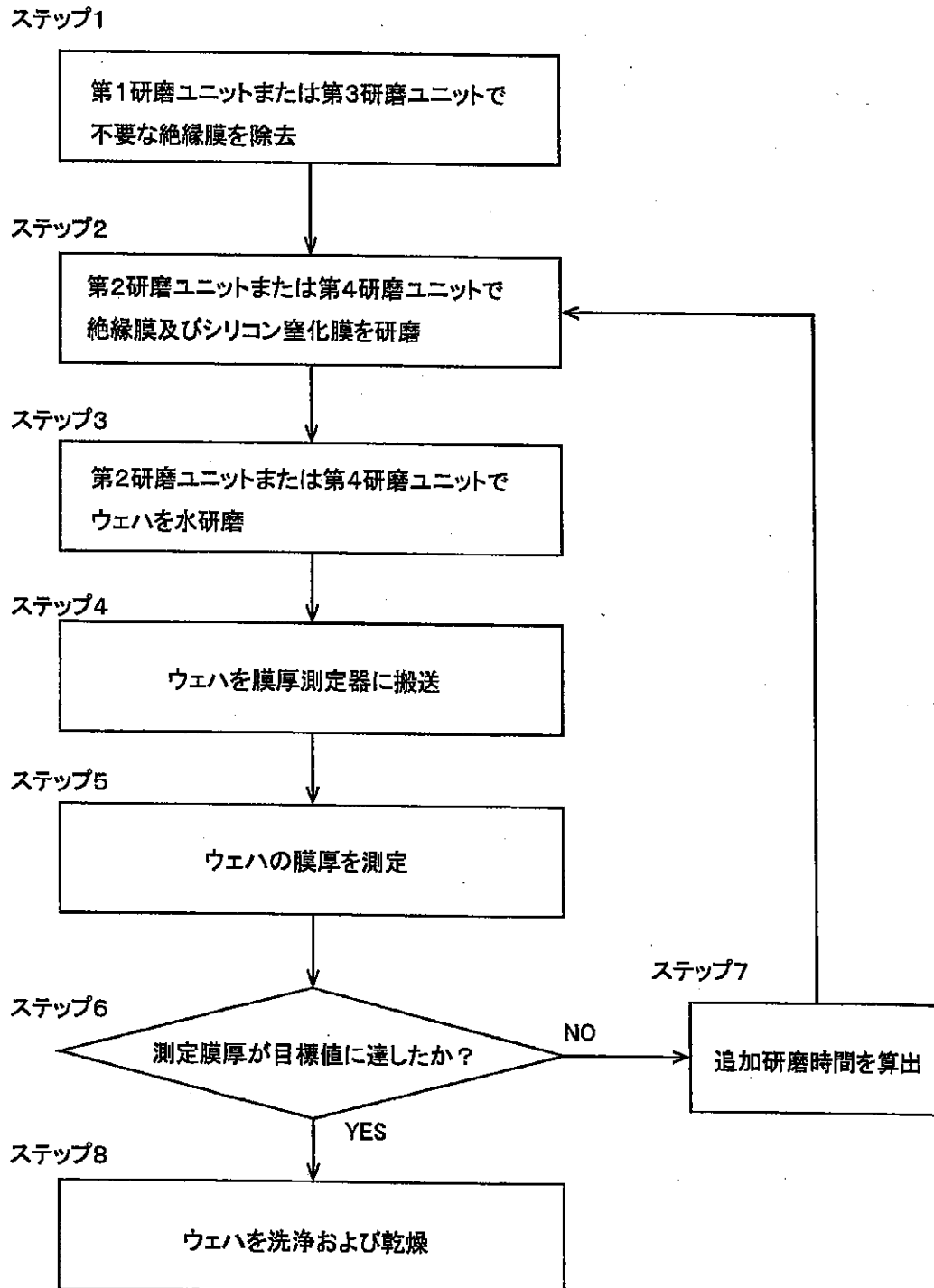


FIG. 34B



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FIG. 35



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FIG. 36

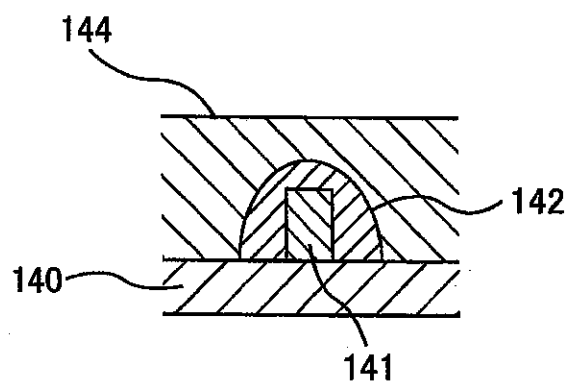


FIG. 37A

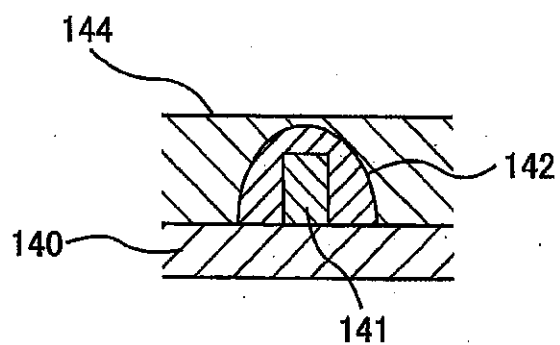


FIG. 37B

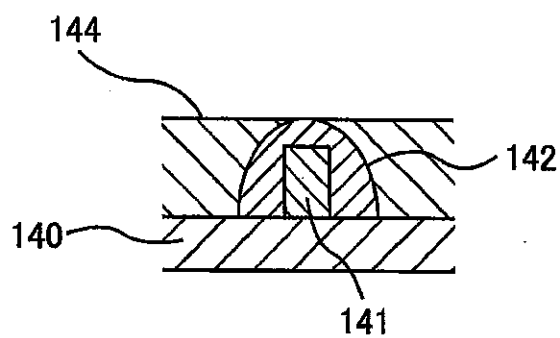


FIG. 37C

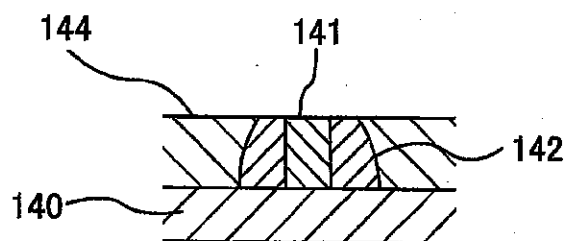


FIG. 37D

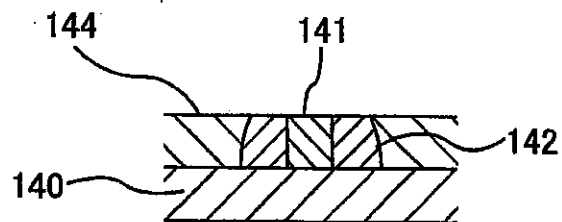
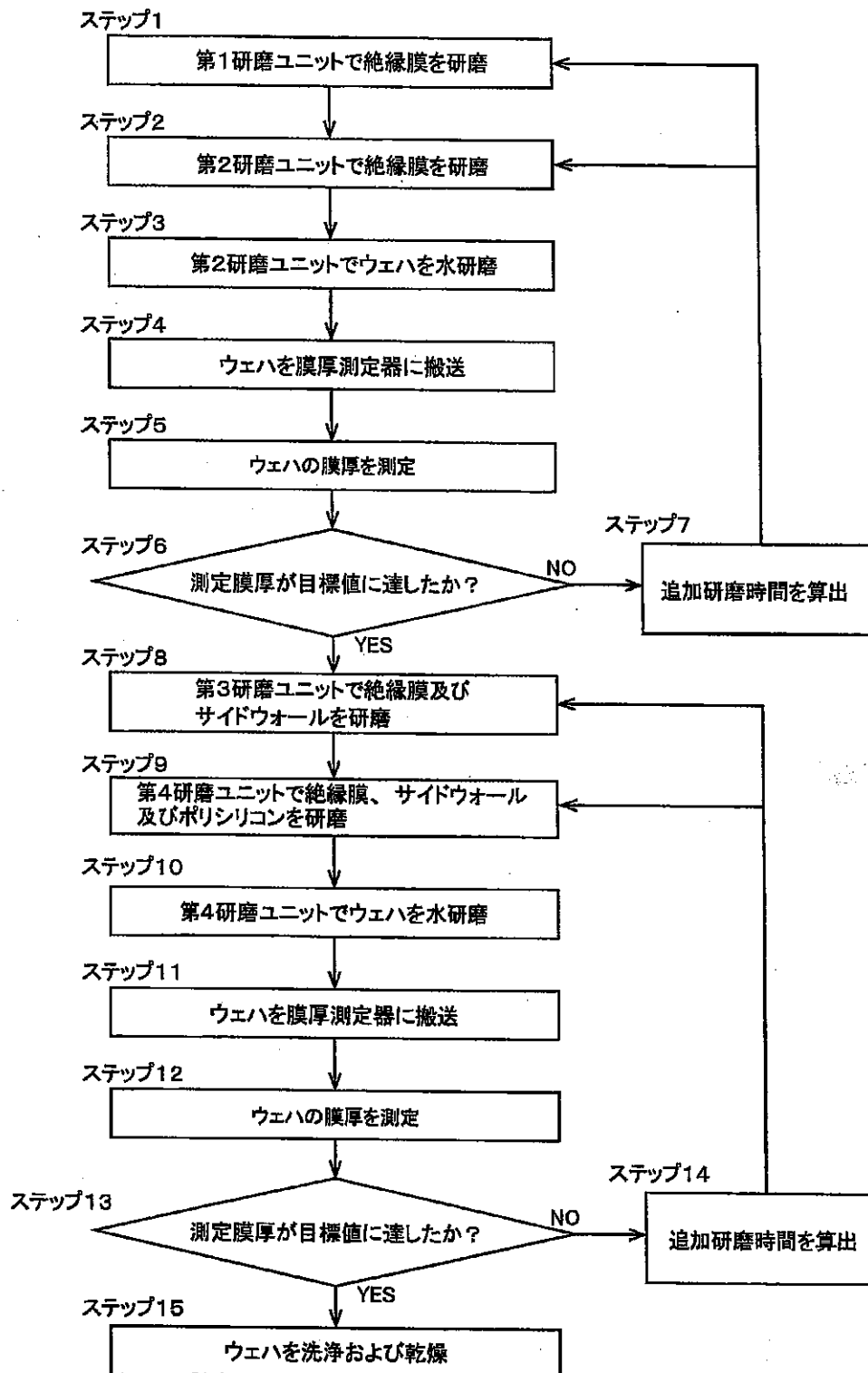
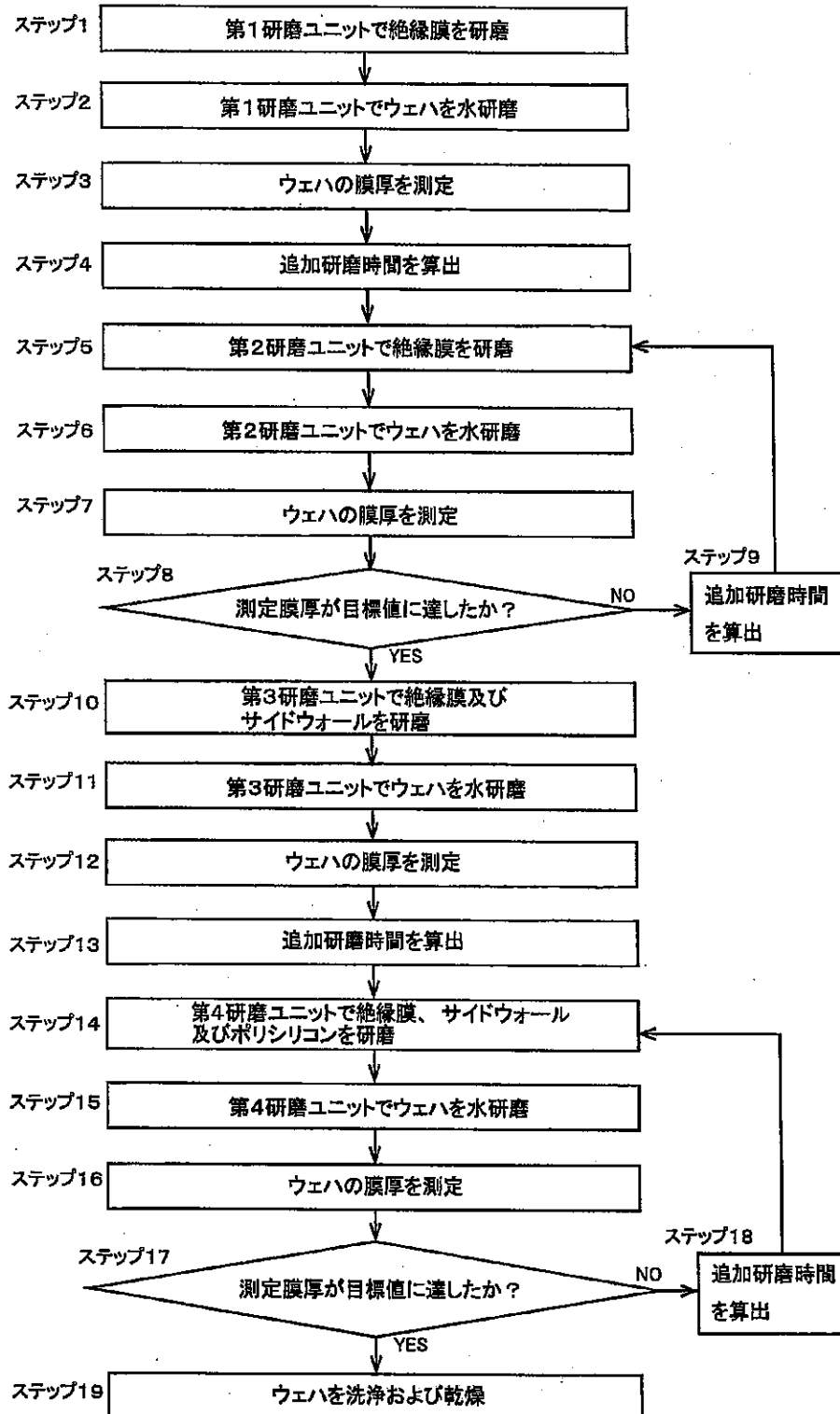


FIG. 38

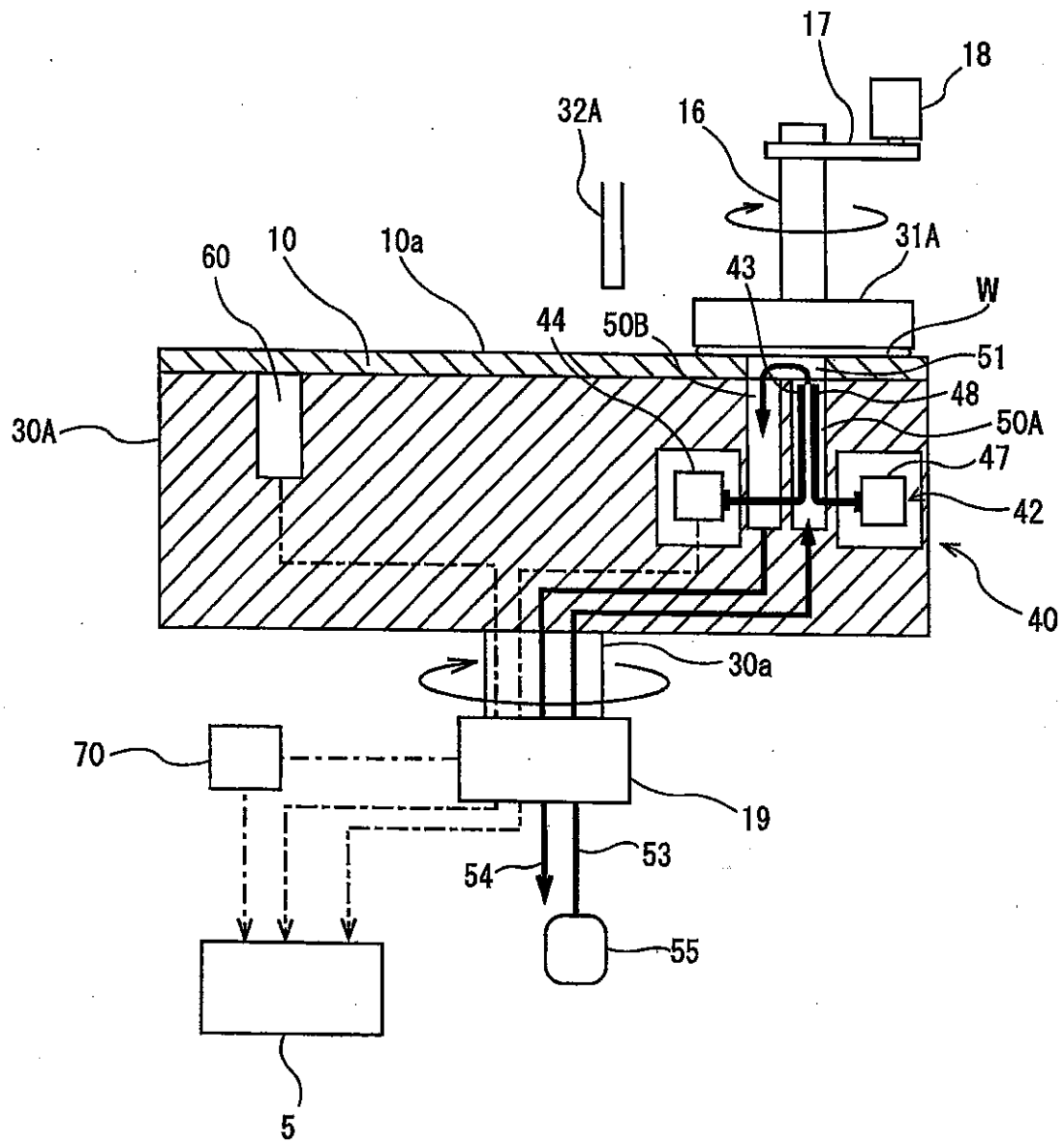


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FIG. 39

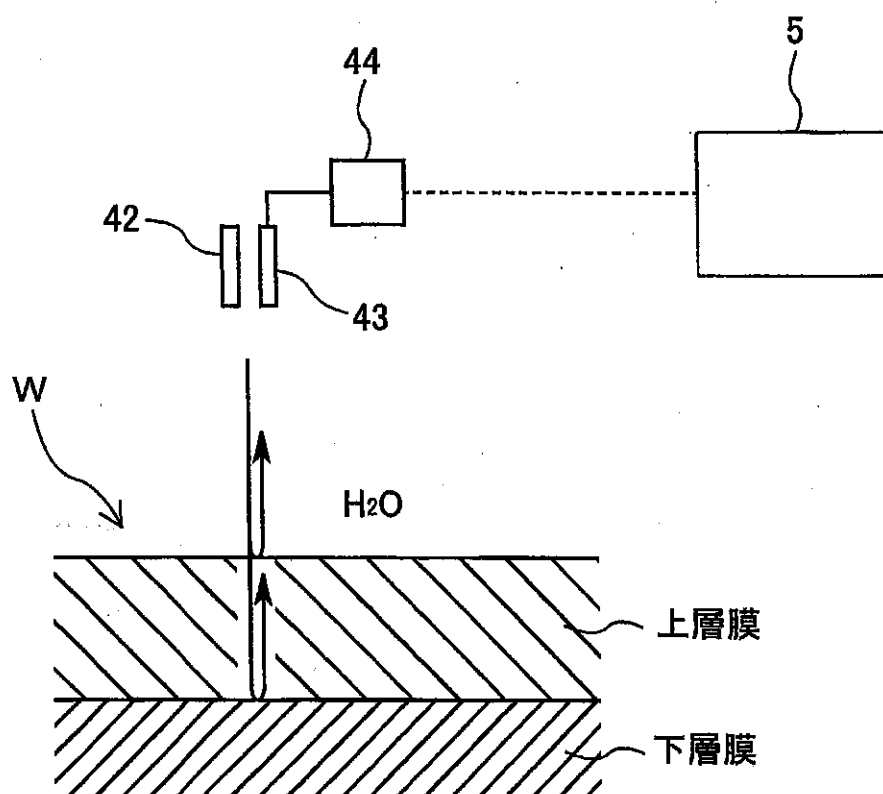


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FIG. 40



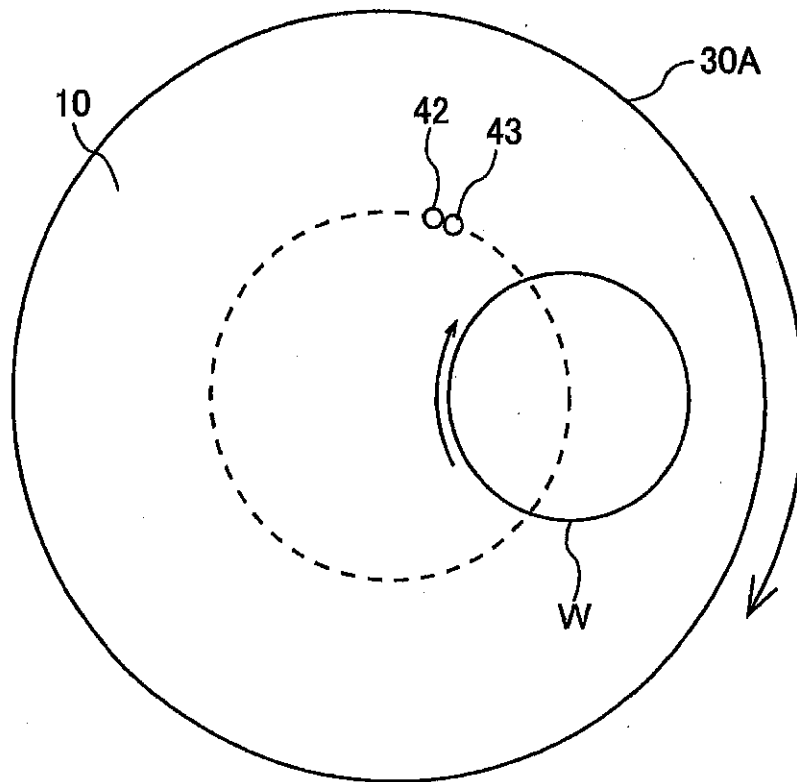
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FIG. 41



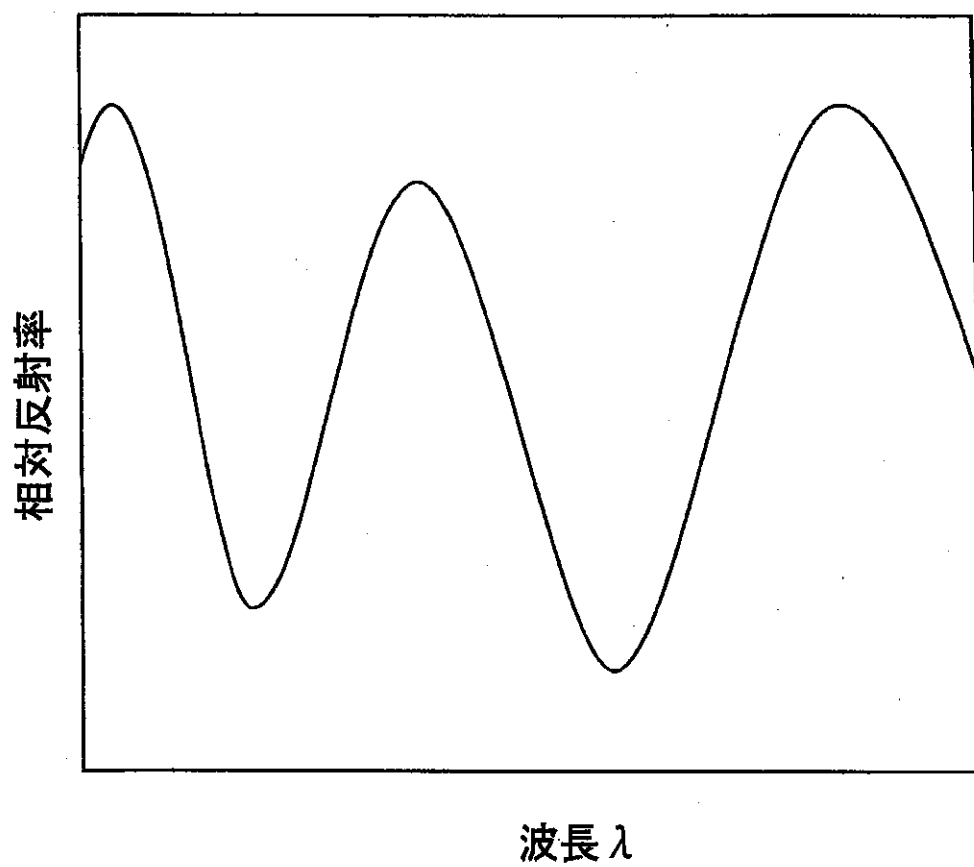
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FIG. 42



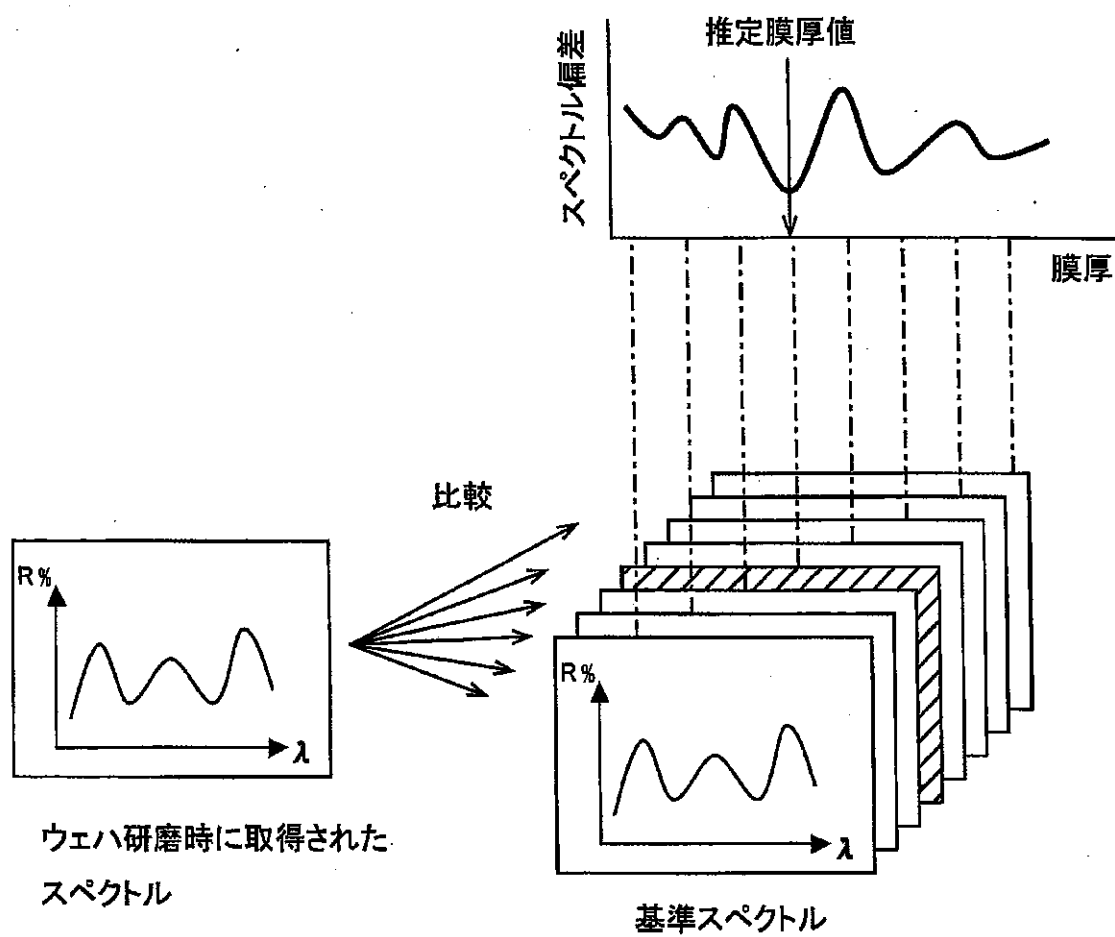
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FIG. 43



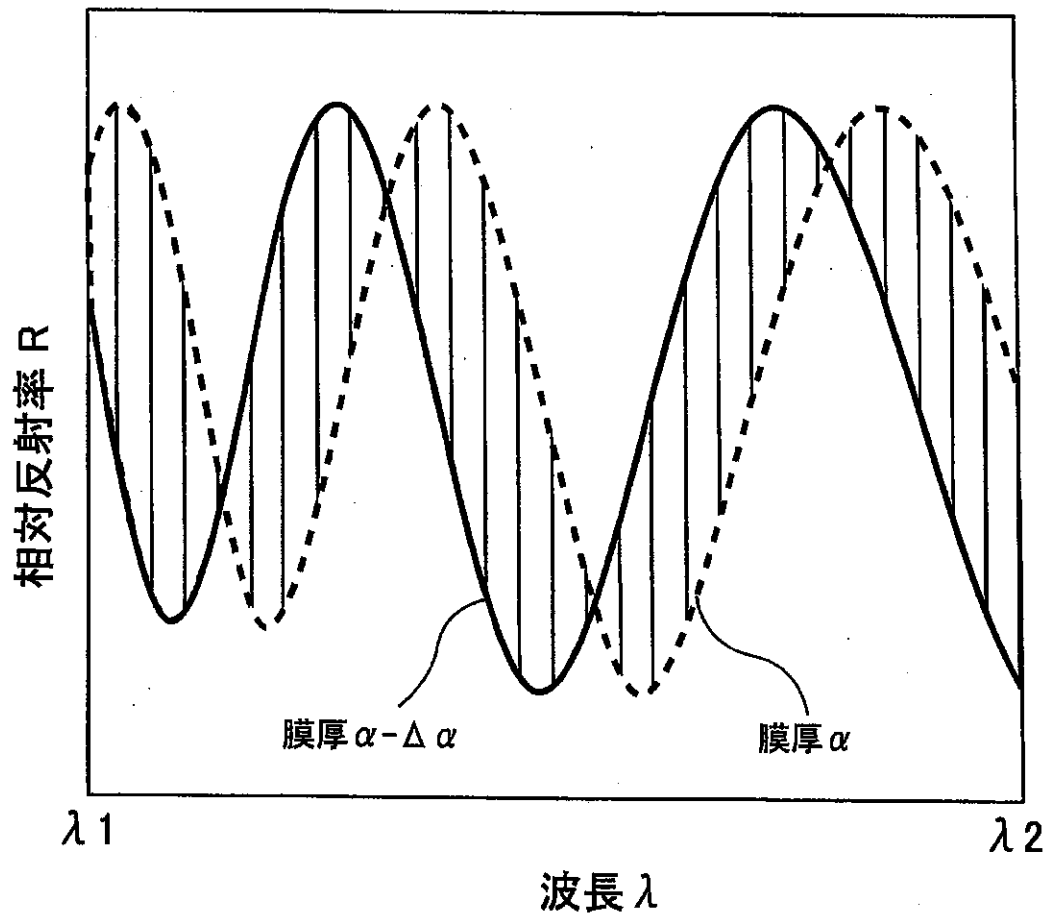
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FIG. 44



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FIG. 45



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FIG. 46

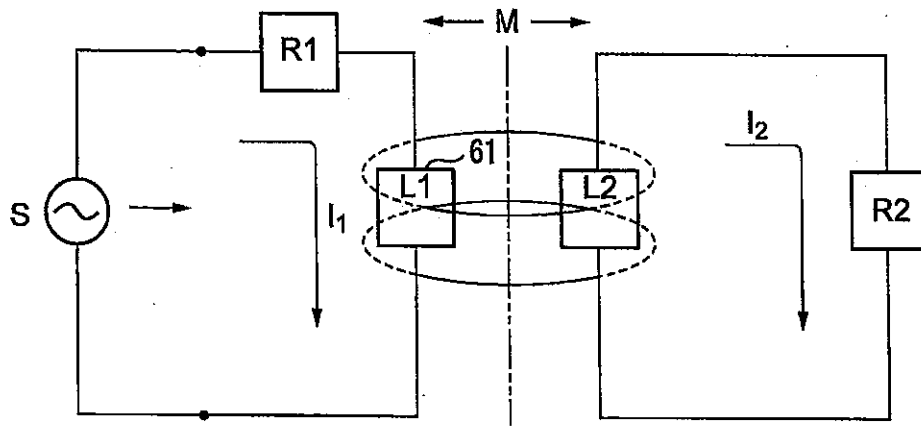
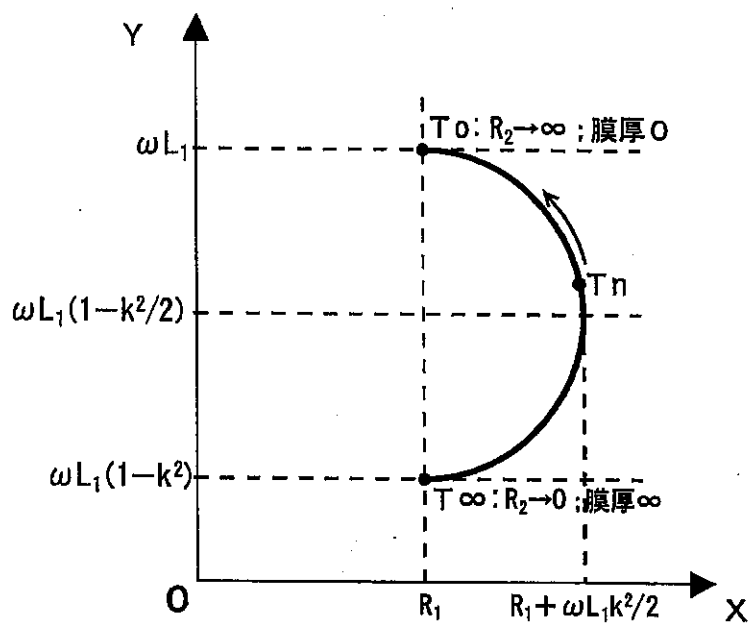


FIG. 47



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FIG. 48

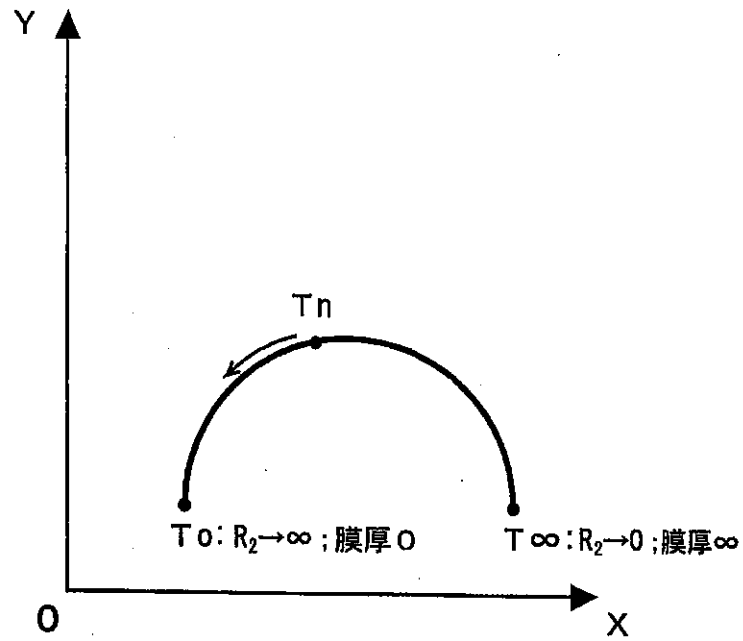
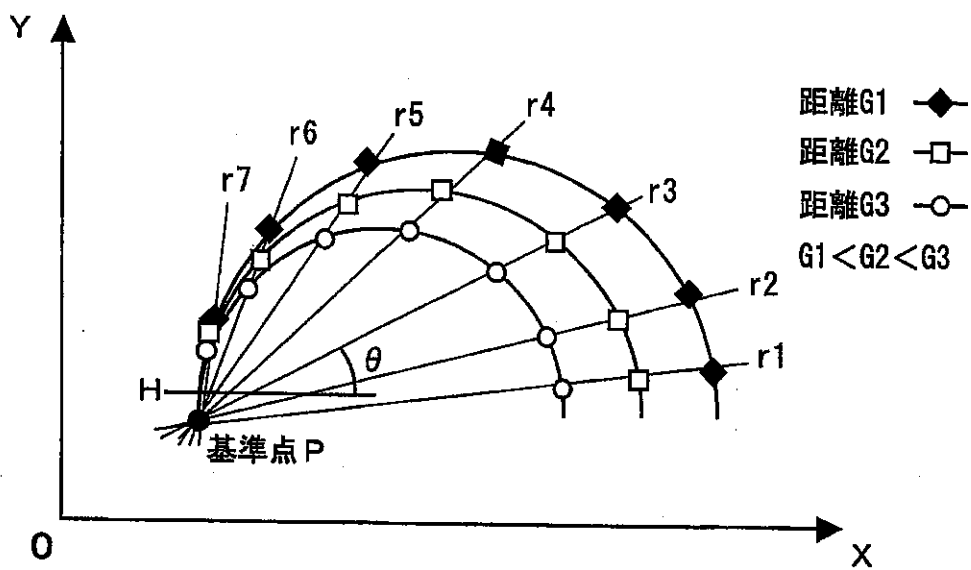


FIG. 49



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FIG. 50

