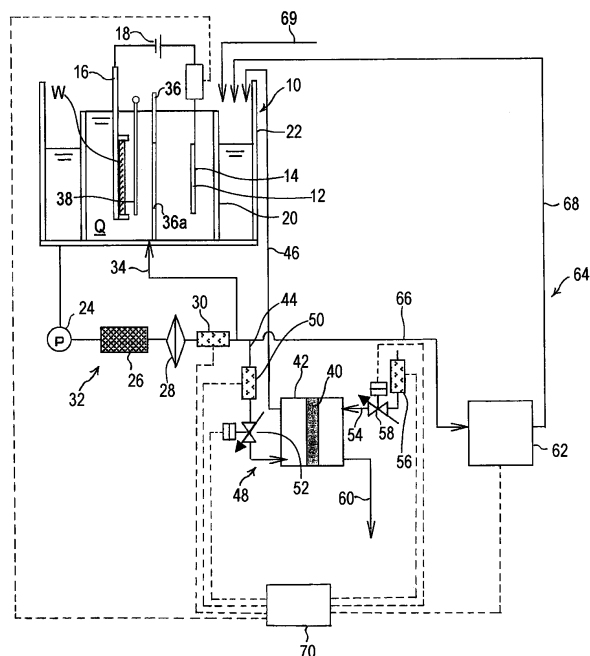


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(72) Inventors:

- **Araki, Yuji**
Tokyo 144-8510 (JP)
- **Shimoyama, Masashi**
Tokyo 144-8510 (JP)

(74) Representative: **Wimmer, Hubert**
WAGNER & GEYER
Gewürzmühlstrasse 5
80538 München (DE)





EUROPEAN SEARCH REPORT

Application Number
EP 13 02 0015

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EPO FORM 1503 03.82 (P04C01)



Application Number

EP 13 02 0015

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

see annex

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-10

Inventive concept I regards a plating apparatus for plating a substrate with Sn alloy to form an Sn alloy film on a surface of the substrate, comprising: a plating bath for retaining a plating solution therein and having an insoluble anode disposed in the plating solution, the substrate being immersed in the plating solution in a position opposite to the insoluble anode; a plating solution dialysis line for extracting the plating solution from the plating bath and returning the plating solution to the plating bath; a dialysis cell provided in the plating solution dialysis line and configured to remove a free acid from the plating solution by dialysis using an anion exchange membrane; and either wherein the plating apparatus comprises a free acid concentration analyzer configured to measure a concentration of the free acid in the plating solution; and a controller for controlling a flow rate of the plating solution flowing through the plating solution dialysis line, based on the concentration of the free acid measured by the free acid concentration analyzer or wherein the plating apparatus comprises a controller for controlling a flow rate of the plating solution flowing through the plating solution dialysis line, based on an integrated value of a quantity of electricity applied to the plating solution in the plating bath, either wherein the plating apparatus further comprises a plating solution circulation line for extracting the plating solution from the plating bath and returning the plating solution to the plating bath during plating of the substrate, the plating solution dialysis line being coupled to the plating solution circulation line or wherein the controller is configured to control the flow rate of the plating solution flowing through the plating solution dialysis line such that the concentration of the free acid in the plating solution lies in a range of 60 to 250 g/L.

2. claims: 11-18

Inventive concept II regards a plating solution management method comprising: forming an Sn alloy film on a surface of a substrate by applying a voltage between an insoluble anode and the substrate disposed opposite to each other in a plating solution retained in a plating bath; extracting the plating solution from the plating bath through a plating solution dialysis line and then returning the plating solution to the plating bath; and removing the free acid from the plating solution flowing through the plating solution dialysis line by a dialysis cell having an anion exchange membrane, and either wherein the method also comprises measuring a concentration of a free acid in the

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

plating solution by a free acid concentration analyzer;
while controlling a flow rate of the plating solution
flowing through the plating solution dialysis line based on
the concentration of the free acid measured by the free acid
concentration analyzer or wherein the method also comprises
controlling a flow rate of the plating solution flowing
through the plating solution dialysis line based on an
integrated value of a quantity of electricity applied to the
plating solution in the plating bath.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 02 0015

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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