

EXHIBIT 5



US008446556B2

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

(10) **Patent No.:** **US 8,446,556 B2**

(45) **Date of Patent:** **May 21, 2013**

(54) **FLEXIBLE PRINTED CIRCUIT AND
ELECTRIC CIRCUIT STRUCTURE**

(56) **References Cited**

(75) Inventors: **Teruo Kawamura**, Osaka (JP); **Toshio Etoh**, Osaka (JP)

U.S. PATENT DOCUMENTS
6,535,261 B1 * 3/2003 Anno et al. 349/147
8,279,612 B2 * 10/2012 Murakami et al. 361/749

(73) Assignee: **Sharp Kabushiki Kaisha**, Osaka (JP)

FOREIGN PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 265 days.

JP 2-9469 * 1/1990
JP 1990-9469 U 1/1990
JP H4-28437 U 3/1992
JP 2007-87999 * 4/2007

(21) Appl. No.: **13/000,615**

OTHER PUBLICATIONS

(22) PCT Filed: **Jun. 24, 2009**

International Search Report (ISR) issued in PCT/JP2009/061505 (parent application) mailed in Jul. 2009 for Examiner consideration.

(86) PCT No.: **PCT/JP2009/061505**

* cited by examiner

§ 371 (c)(1),

(2), (4) Date: **Dec. 21, 2010**

Primary Examiner — Mike Qi

(87) PCT Pub. No.: **WO2010/004875**

(74) *Attorney, Agent, or Firm* — Chen Yoshimura LLP

PCT Pub. Date: **Jan. 14, 2010**

(65) **Prior Publication Data**

US 2011/0102729 A1 May 5, 2011

(30) **Foreign Application Priority Data**

Jul. 8, 2008 (JP) 2008-178299

(51) **Int. Cl.**

G02F 1/1345 (2006.01)

(52) **U.S. Cl.**

USPC 349/149; 349/150; 349/151; 349/152

(58) **Field of Classification Search** 349/149,

349/150, 151, 152

See application file for complete search history.

(57) **ABSTRACT**

Provided are a flexible printed circuit that reduces the chance of the occurrence of short-circuit failures caused by swarf generated from punching out flexible printed circuit, and an electric circuit structure having this flexible printed circuit and an electric circuit substrate to which the flexible printed circuit is connected. A flexible printed circuit (100) has a wiring pattern (2) formed on the flexible base film (1). The flexible printed circuit (100) is individually punched out to be separated in a condition where the wiring pattern (2) is disposed on the base film (1), and the wiring pattern (2) has a narrowed portion (2c) near the edge of the base film (1).

6 Claims, 5 Drawing Sheets

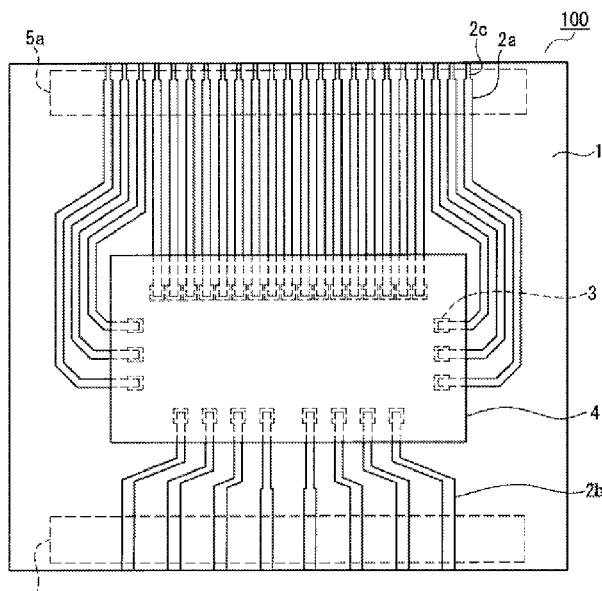


FIG. 1

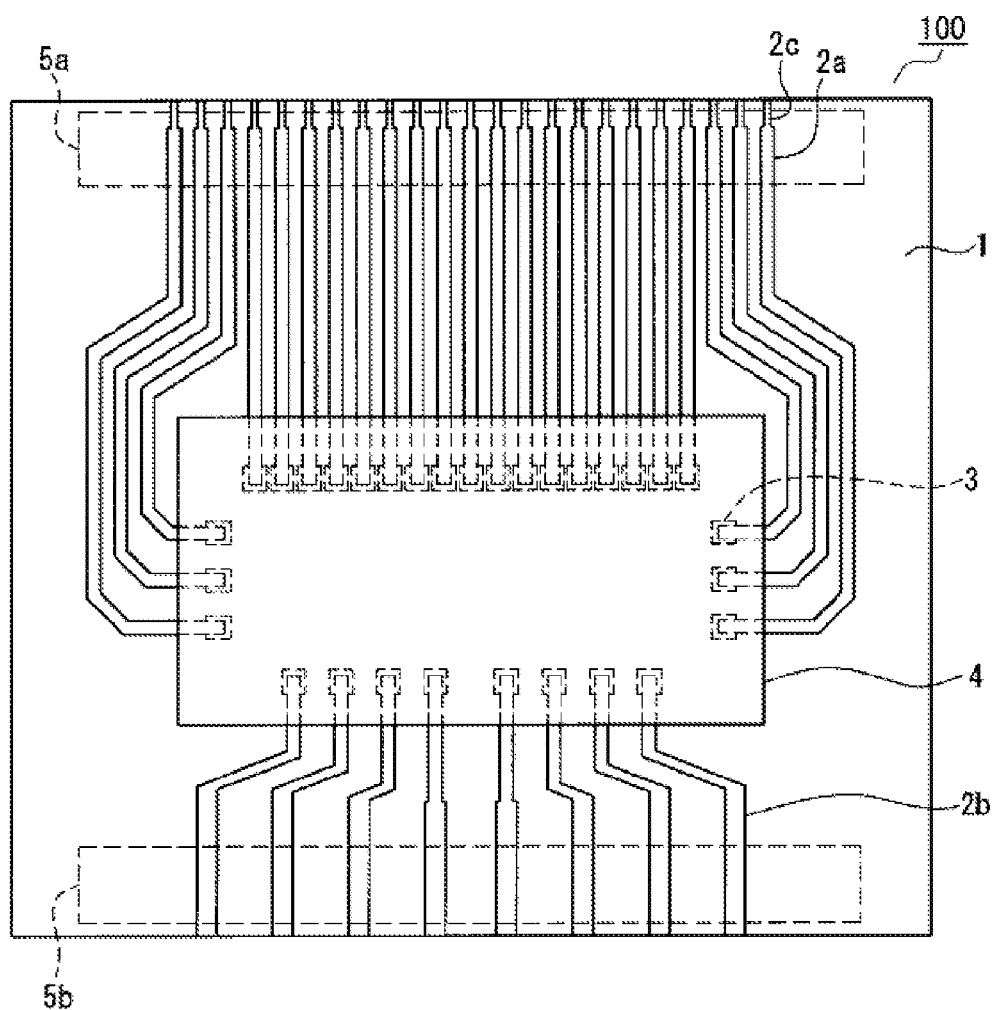


FIG. 2

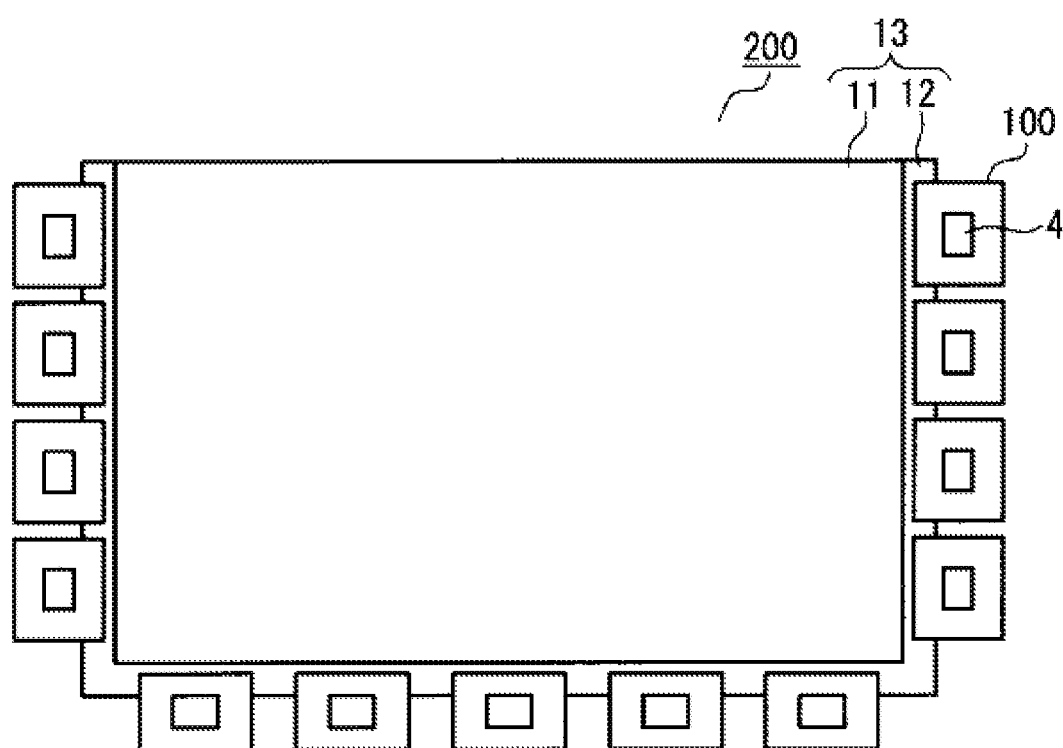
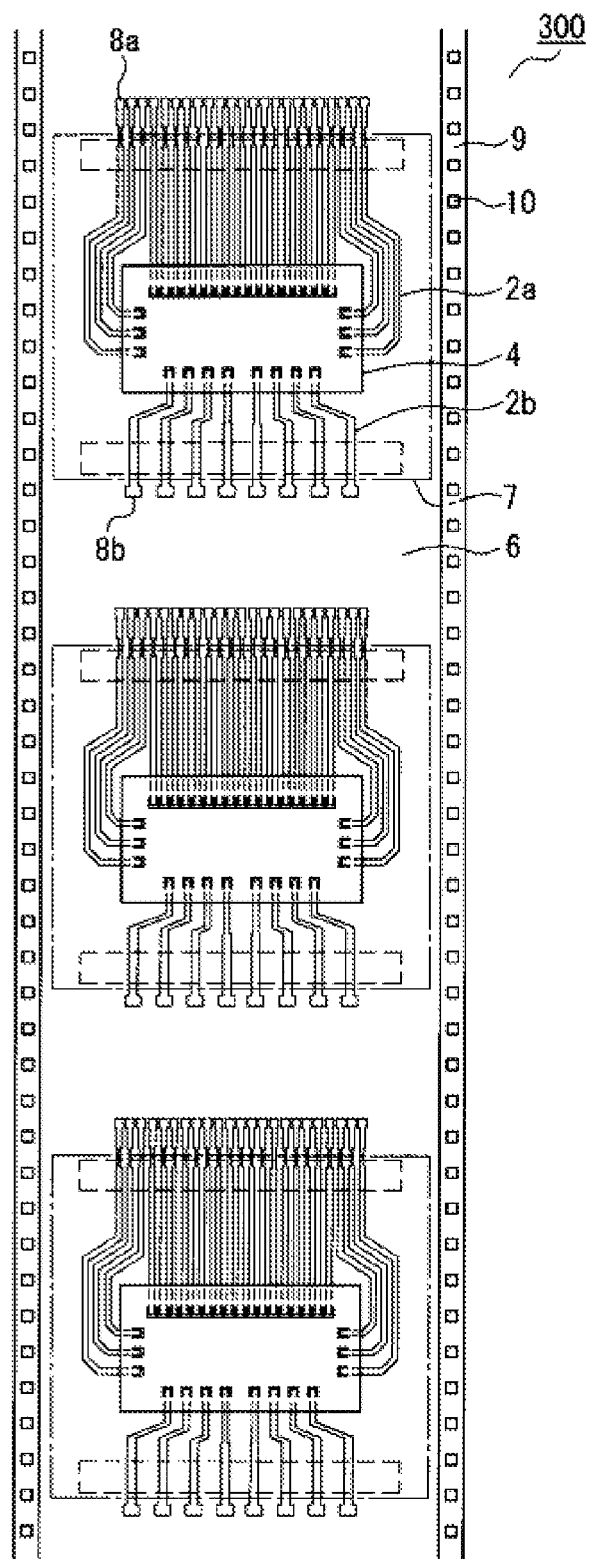


FIG. 3



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.