

EXHIBIT 5



US008446556B2

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

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

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

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

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§ 371 (c)(1),

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(30) **Foreign Application Priority Data**

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(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.

(56) **References Cited**

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

FOREIGN PATENT DOCUMENTS

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

OTHER PUBLICATIONS

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

* cited by examiner

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(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

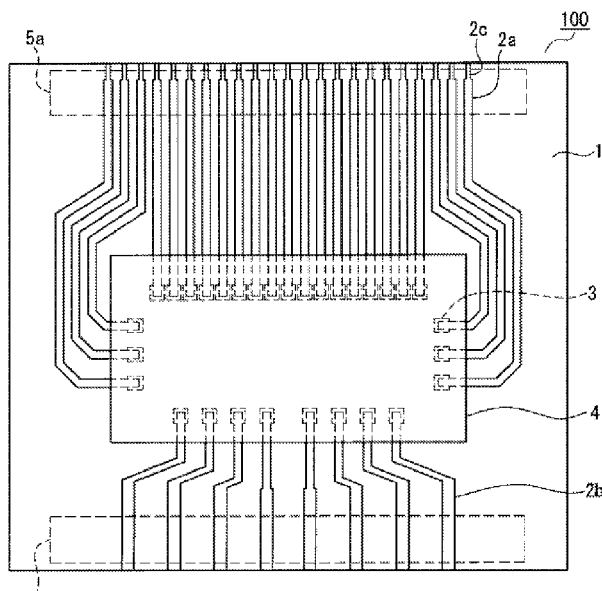


FIG. 1

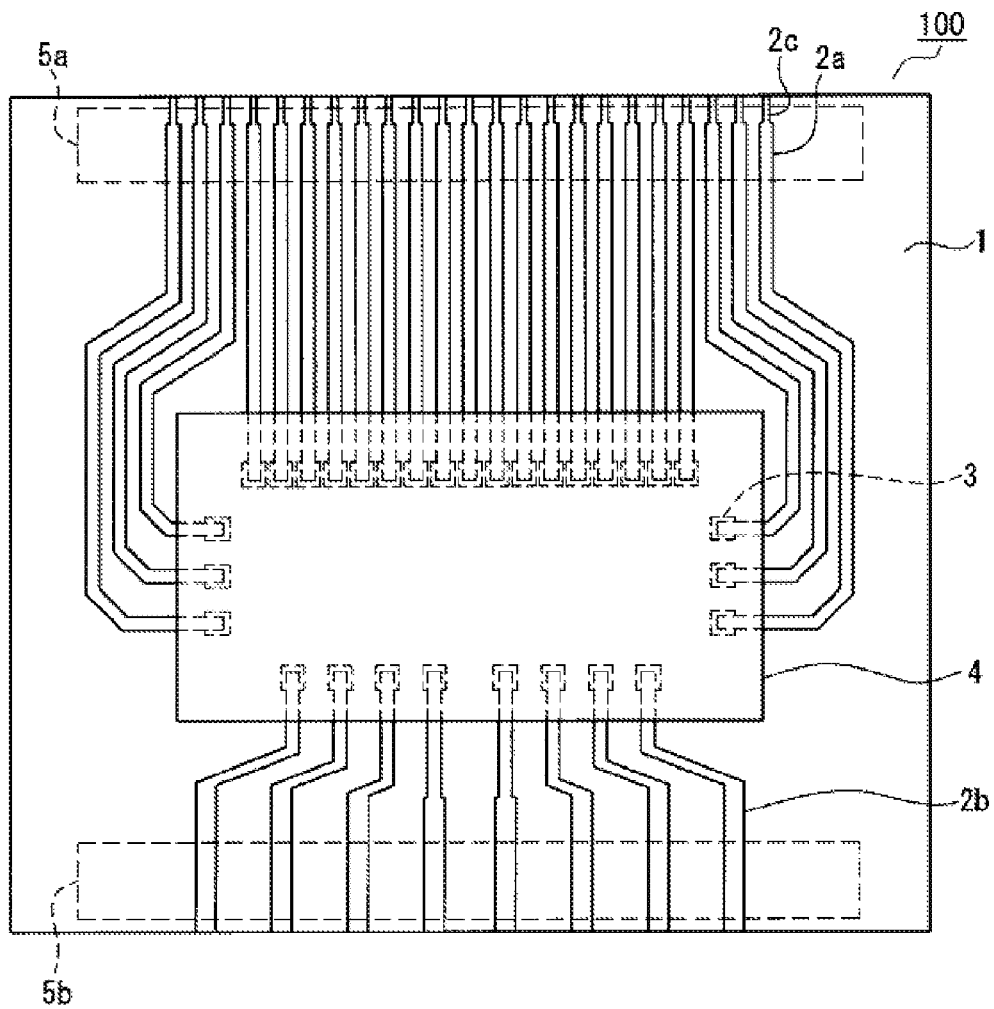


FIG. 2

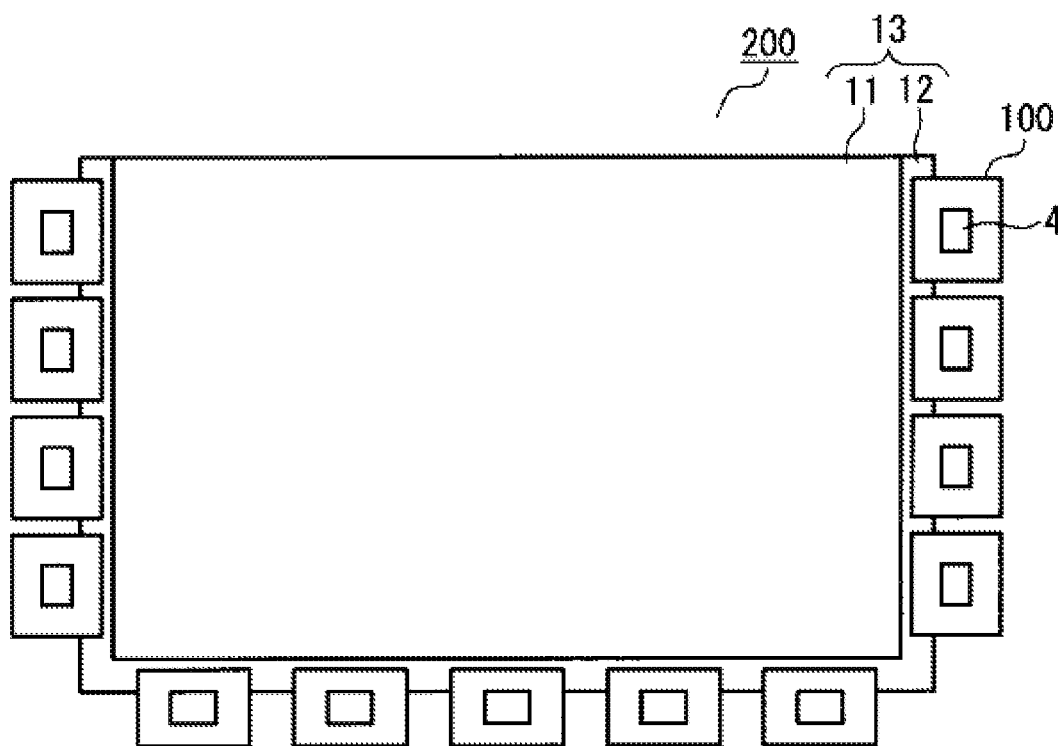
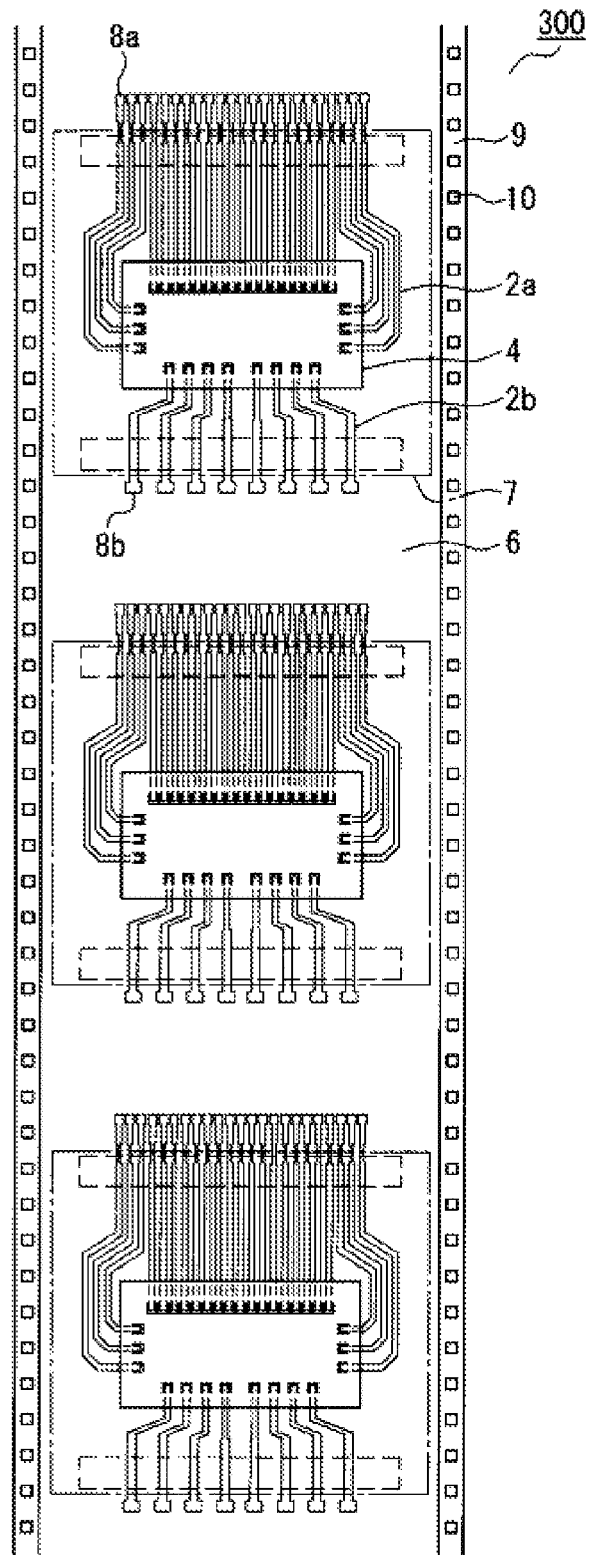


FIG. 3



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