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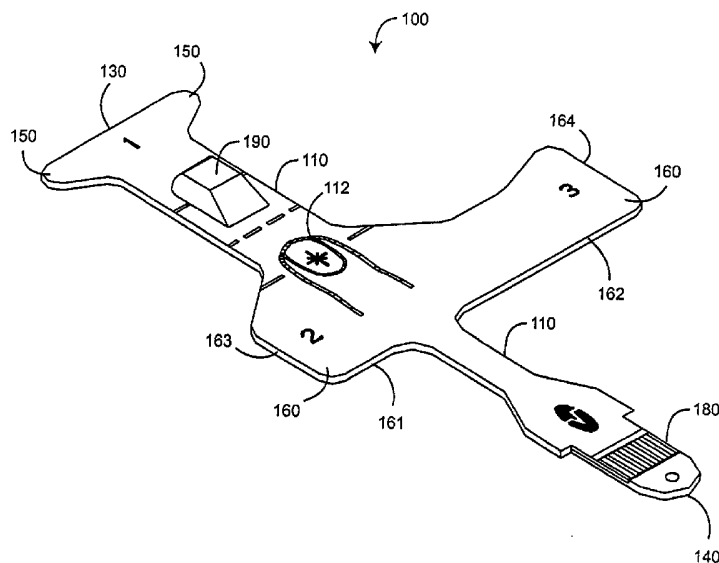
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FLEX CIRCUIT SHIELDED OPTICAL SENSOR AND METHOD OF FABRICATING THE SAME



(57) Abstract: A flex circuit optical sensor has an integrated Faraday shield. A conductive trace layer disposed on a substrate is used to form a conductive grid which shields the face of a photodetector. A conductive ink layer is formed on a substrate side opposite the trace layer. The back and sides of the detector are shielded by flex circuit flaps that have the conductive ink layer but substantially exclude the trace layer so as to fold over and closely adhere to the detector body. The shielded substrate flaps advantageously eliminate a separate detector shield, which is typically fabricated with an etched copper part that must be attached to a flex circuit before mounting the detector.



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INTERNATIONAL SEARCH REPORT

In - onal Application No

PCT/US 02/13961

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 782 757 A (GERHARDT THOMAS J ET AL) 21 July 1998 (1998-07-21) cited in the application	1,3-5, 12,15,16
A	column 30, line 31 -column 31, line 24; figures 45A-45C	2,6,13, 14,17
A	column 25, line 15-50 --- WO 94 27494 A (SOMANETICS CORP) 8 December 1994 (1994-12-08) page 5, line 24 -page 7, line 5; figures 1,3,3A page 11, line 1-32; figure 12 claim 1 --- -/-	1-5, 12-16

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

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19.12.02

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Int. Patent Application No.
PCT/US 02/13961

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00 59374 A (SOMANETICS CORP ;SCHEUING RICHARD S (US); YOUNGBLOOD JAMES H (US)) 12 October 2000 (2000-10-12) page 4, line 15 -page 6, line 4; figures 2-5 ---	1, 3, 4
X	US 5 678 544 A (MIDDLEMAN LEE ET AL) 21 October 1997 (1997-10-21) column 2, line 31-41 column 3, line 66 -column 4, line 22 column 4, line 47-54; figures 1,2 column 6, line 4-20; figures 6,7 ---	6-8, 17-20 9-11
X	US 6 184 521 B1 (COFFIN IV JAMES P ET AL) 6 February 2001 (2001-02-06) column 3, line 19-37 column 8-29; figures 4,5 column 10, line 12-38; figure 6 ---	6,11 7-10
A	FR 2 685 865 A (DISTR APP MEDICAUX OFF) 9 July 1993 (1993-07-09) page 3, line 15 -page 4, line 8; figure 2 ---	6
A	WO 92 21280 A (SOMANETICS CORP) 10 December 1992 (1992-12-10) the whole document -----	6,17-19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/13961

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-5, 12-16

Optical sensor comprising a flex circuit.
It further comprises a detector and an emitter mounted to the flex circuit and a plurality of flap portions.
Method of assembling the same.

2. Claims: 6-11

Optical sensor comprising a flex circuit.
It further comprises a trace layer with a pattern of conductors and a conductive grid.

3. Claims: 17-20

Optical sensor comprising a substrate means for supporting a flex circuit and a shield means including a trace means and a conductive ink means.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 02/13961

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