



(51) International Patent Classification:

H01L 23/48 (2006.01) A61B 1/00 (2006.01)
 H01L 23/49 (2006.01) A61B 1/05 (2006.01)
 H01L 23/485 (2006.01) H01L 29/06 (2006.01)
 H01L 21/768 (2006.01)

(21) International Application Number:

PCT/IB2013/051370

(22) International Filing Date:

20 February 2013 (20.02.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/605,265 1 March 2012 (01.03.2012) US

(71) Applicant: **KONINKLIJKE PHILIPS N.V.** [NL/NL];
 High Tech Campus 5, NL-5656 AE Eindhoven (NL).

(72) Inventors: **DEKKER, Ronald**; c/o High Tech Campus,
 Building 44, NL-5656 AE Eindhoven (NL). **HENNEKEN,
 Vincent Adrianus**; c/o High Tech Campus, Building 44,
 NL-5656 AE Eindhoven (NL). **MULDER, Marcel**; c/o
 High Tech Campus, Building 44, NL-5656 AE Eindhoven
 (NL).

(74) Agents: **STEFFEN, Thomas et al.**; c/o High Tech Cam-
 pus, Building 44, NL-5656 AE Eindhoven (NL).

(81) Designated States (unless otherwise indicated, for every
 kind of national protection available): AE, AG, AL, AM,
 AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,

BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
 DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
 HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
 KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
 ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
 NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU,
 RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ,
 TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
 ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
 kind of regional protection available): ARIPO (BW, GH,
 GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
 UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
 TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
 EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
 MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
 TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
 ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))

(88) Date of publication of the international search report:

19 December 2013

(54) Title: WIRE ARRANGEMENT FOR AN ELECTRONIC CIRCUIT AND METHOD OF MANUFACTURING THE SAME

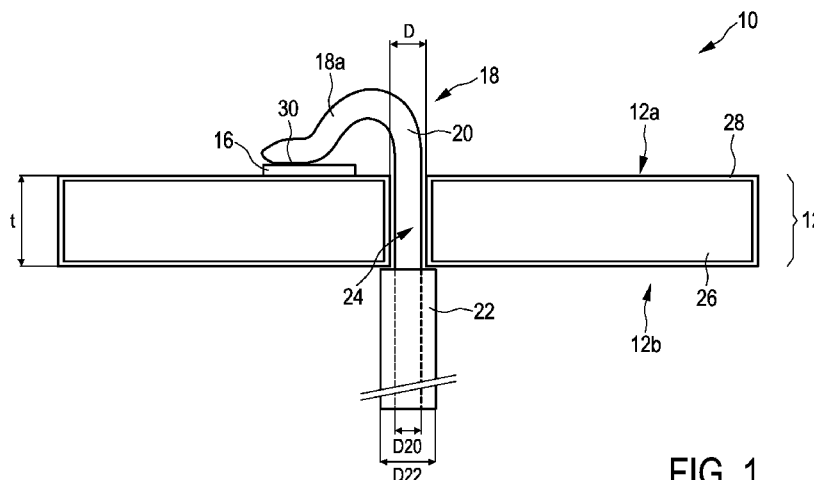


FIG. 1

(57) Abstract: The present invention relates to an electronic circuit arrangement (10) comprising: a substrate (12) having a first surface (12a) and a second surface (12b), an electronic circuit, an electrical connection part (16) for providing an electrical connection to the electronic circuit and being arranged on the first surface (12a), and at least one electrical wire (18). The electrical wire (18) comprises at least one conductive core (20) and an isolation (22) surrounding the conductive core (20). An end portion (18a) of the electrical wire (18) is an isolation-free portion for allowing access to the conductive core (20), wherein the end portion (18a) of the electrical wire (18) is connected to the electrical connection part (16). At least one through-hole (24) extending from the first surface (12a) to the second surface (12b) is provided in the substrate (12), wherein the electrical wire (18) is arranged through the through-hole (24).

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2013/051370

A. CLASSIFICATION OF SUBJECT MATTER

INV. H01L23/48 H01L23/49 H01L23/485 H01L21/768 A61B1/00
A61B1/05 H01L29/06

ADD.

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)

H01L 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 practicable, 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 5 777 391 A (NAKAMURA ATSUSHI [JP] ET AL) 7 July 1998 (1998-07-07)	1,2,5,14
Y	column 7, line 11 - line 65; figures 2,3,4	1,9,10

X	US 2007/126091 A1 (WOOD ALAN G [US] ET AL) 7 June 2007 (2007-06-07)	1-5,8,14
	paragraphs [0006], [0008], [0047], [0053] - [0061], [0065] - [0067], [0070], [0072], [0073], [0079], [0080], [0087], [0091], [0100]; claims 14,21,30,46,47; figures 1A-1D,1I,1J,1M,2H,3A,3D,3E,3F,3H,3I,3J	

	-/-	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family 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 application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

30 August 2013

Date of mailing of the international search report

11/09/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Ahlstedt, Mattias

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2013/051370

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 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 fees, this Authority did not invite payment of additional fees.
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.:
14(completely); 1-10(partially)
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 and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2013/051370

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/246819 A1 (HEMBREE DAVID R [US] ET AL) 25 October 2007 (2007-10-25) paragraphs [0036], [0037], [0042], [0044], [0045], [0046], [0049], [0051], [0053], [0054], [0072], [0074], [0078], [0102]; figures 1A-1C, 2N, -----	1-3, 5, 8, 14
X	US 7 364 461 B1 (BACK GERALD W [US] ET AL) 29 April 2008 (2008-04-29) column 2, line 15 - column 3, line 65 column 4, line 48 - column 5, line 55 column 6, line 66 - column 8, line 24; claim 1; figures 3, 5, 6, 7 -----	1, 2, 5-7
Y	DE 28 27 640 A1 (CHUO MEIBAN MFG CO) 10 January 1980 (1980-01-10)	1, 9, 10
A	page 9, line 11 - line 24 page 10, line 21 - line 26 page 13, line 5 - page 14, line 11 page 17, line 16 - page 18, line 30; claim 1; figures 7-9, 10a-10c, 11a-11c, 12 -----	5, 6, 14

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 14(completely); 1-5, 8(partially)

see below

1.1. claims: 3, 4, 8(all partially)

wherein the main portion is conductive or semi-conductive or is made of silicon.

1.2. claim: 5(partially)

wherein the end portion of the electrical wire is connected to the electrical connection part using a solder connection.

2. claims: 6-8(partially)

directed to that the through-hole comprises a first portion open to the first surface and having a first diameter (D1) and a second portion open to the second surface and having a second diameter (D2) bigger than the first diameter (D1).

3. claims: 9, 10(partially)

directed to that at least one cantilever spring portion hold/contacts the electrical wire.

4. claims: 11-13(partially)

directed to a sensor and/or actuator arrangement comprising the electrical circuit arrangement of claim 1 and at least one sensor and/or actuator, wherein the electrical circuit is configured to transmit electrical signals to the at least one actuator and/or receive electrical signals from the at least one sensor.

5. claims: 1-13(partially)

directed to that the electrical wire comprising more than one conductive core and an isolation.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2013/051370

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5777391	A	07-07-1998	JP 3487524 B2 19-01-2004
		JP H08227908 A	03-09-1996
		US RE41478 E1	10-08-2010
		US RE41721 E1	21-09-2010
		US RE41722 E1	21-09-2010
		US RE42972 E1	29-11-2011
		US RE43444 E1	05-06-2012
		US 5777391 A	07-07-1998

US 2007126091	A1	07-06-2007	US 2007126091 A1 07-06-2007
			US 2007167000 A1 19-07-2007
			US 2008042247 A1 21-02-2008
			US 2010264521 A1 21-10-2010
			US 2012228781 A1 13-09-2012

US 2007246819	A1	25-10-2007	EP 2016607 A2 21-01-2009
			JP 4853747 B2 11-01-2012
			JP 2009534865 A 24-09-2009
			KR 20080111156 A 22-12-2008
			TW I362709 B 21-04-2012
			US 2007246819 A1 25-10-2007
			US 2010047934 A1 25-02-2010
			US 2011024745 A1 03-02-2011
			US 2012043670 A1 23-02-2012
			US 2012288997 A1 15-11-2012
			WO 2007133302 A2 22-11-2007

US 7364461	B1	29-04-2008	NONE

DE 2827640	A1	10-01-1980	NONE
