



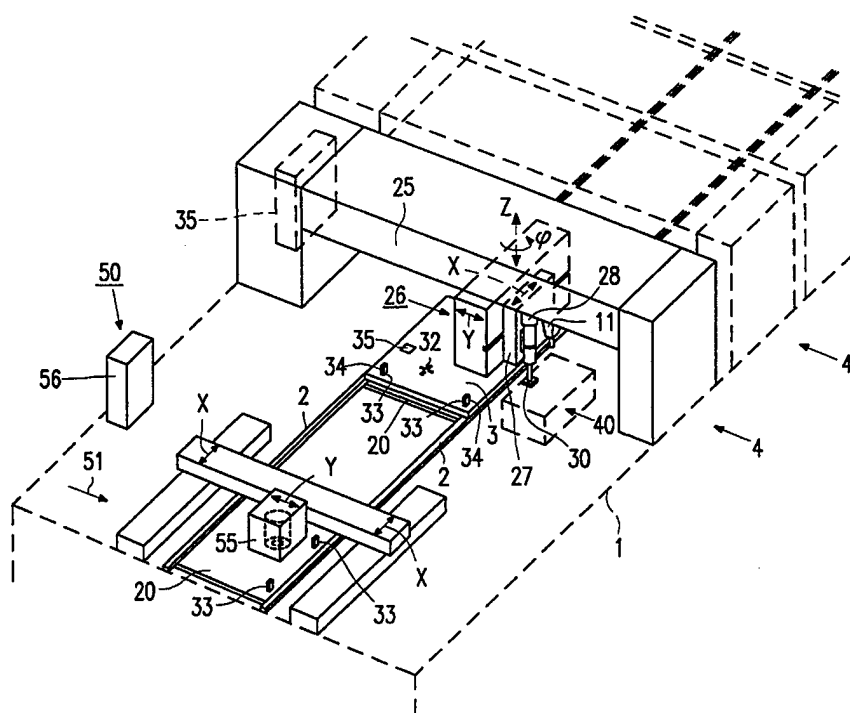
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H05K 13/02, 13/04	A3	(11) International Publication Number: WO 98/24291 (43) International Publication Date: 4 June 1998 (04.06.98)
(21) International Application Number: PCT/IB97/01310 (22) International Filing Date: 20 October 1997 (20.10.97) (30) Priority Data: 96203330.4 26 November 1996 (26.11.96) EP (34) Countries for which the regional or international application was filed: NL et al. (71) Applicant: PHILIPS ELECTRONICS N.V. [NL/NL]; Groe- newoudseweg 1, NL-5621 BA Eindhoven (NL). (71) Applicant (for SE only): PHILIPS NORDEN AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE). (72) Inventor: LAND, Egbert, Frederik, Anton; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). (74) Agent: COBBEN, Louis, M., H.; Internationaal Octrooibureau B.V., P.O. Box 220, NL-5600 AE Eindhoven (NL).		(81) Designated States: JP, KR, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 30 July 1998 (30.07.98)

(54) Title: METHOD AND MACHINE FOR PLACING COMPONENTS ON A CARRIER AND A CALIBRATION CARRIER
DETECTION DEVICE FOR USE IN THE METHOD AND IN THE MACHINE

(57) Abstract

A calibration method and device are described, notably for a component-placement machine for placing components (30) on a carrier (3), which machine comprises carrier-positioning means (50) and component-positioning means (26, 27, 11; 40). The positions of components placed on a calibration carrier (60, 65) during a calibration procedure are detected by means of a calibration carrier detection device (50) which is present in the machine itself. For obtaining a satisfactory contrast between the components (30) and the calibration carrier surface, the latter may be provided with a reflecting and adhesive foil (65, 66). In a machine provided with a production carrier detection device, this device may be used as a calibration carrier detection device.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 97/01310

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H05K 13/02, H05K 13/04

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)

IPC6: H05K

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

SE,DK,FI,NO classes as above

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

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5547537 A (EDWARD P. REYNOLDS ET AL), 20 August 1996 (20.08.96), claims 1-8, abstract ---	1,14,17,19, 20,24
X	US 4738025 A (AARON L. ARNOLD), 19 April 1988 (19.04.88), claims 1-20, abstract ---	1,14,17,19, 20,24
P	WO 9722238 A1 (PHILIPS ELECTRONICS N.V.), 19 June 1997 (19.06.97), page 2, line 3 - line 14, abstract -----	1,14

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

☒ See patent family annex.

* Special categories of cited documents:

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- "E" earlier document 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

28 May 1998

Date of mailing of the international search report

29 -05- 1998

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 97/01310

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 next page

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 97/01310

- I. Claims 1-10, 14-16: Method and device for placing components
- II. Claims 11-13: A calibration carrier
- III. Claims 17-19: A calibration carrier detection device
- IV. Claims 20-23: An optical detection device.
- V. Claim 24: A component carrier

These groups of inventions are not so linked as to form a single general inventive concept (PCT) Rule 13.1). There is no technical relationship among those inventions involving one or more of the same or corresponding "technical features" within the meaning of PCT Rule 13.2.

INTERNATIONAL SEARCH REPORT

Information on patent family members

29/04/98

International application No.

PCT/IB 97/01310

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
US	5547537	A	20/08/96	NONE		
US			4738025	A	19/04/88	CA 1266761 A
						20/03/90
						EP 0273561 A
						06/07/88
						JP 63180111 A
						25/07/88
WO			9722238	A1	19/06/97	EP 0809926 A
						03/12/97