PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB2009/050170	19.01.2009	22.01.2008

International Patent Classification (IPC) or both national classification and IPC
INV. G01N33/542 G01N33/543

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N. V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Weber, Peter Telephone No. +49 89 2399-7437

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IB2009/050170

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material:

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing:

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in electronic form.

      ☐ furnished subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-11
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-11
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1: WO 2005/010542 A
D2: SCHOTTER J ET AL, BIOSENS BIOELECTRON, 19(10), 2004, 1149-1156
D3: KÖTITZ R ET AL, IEEE TRANS APPL SUPERCOND, 7(2), 1997, 3678-3681
D4: GRAHAM D L ET AL, TRENDS BIOTECHNOL, 22(9), 2004, 455-462
D5: BISHOP J ET AL, OPTICS EXPRESS, 15(8), 2007, 4390-4397
D6: SAPSFORD K E ET AL, ANAL CHEM, 74(5), 2002, 1061-1068
D7: FRUTOS A G ET AL, J AM CHEM SOC, 124(11), 2002, 2396-2397
D8: SUN ET AL, BIOSENS BIOELECTRON, 23(4), 2007, 473-478
D9: BLICKLE V ET AL, APPL PHYS LETT, 87(101102), 2005, 1-3

2 NOVELTY (Article 33(2) PCT) and INVENTIVE STEP (Article 33(3) PCT)

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-11 is neither new in the sense of Article 33(2) PCT nor does involve an inventive step in the sense of Article 33(3) PCT for the following reasons:

2.1.1 Independent claim 1

Document D1 discloses (the references in parentheses applying to this document):

A method for the detection of a parameter of interest (claim 11: concentration of magnetic particles) that is related to target components in a sample, comprising the following steps: a) distributing a quantity of indicator particles in the sample (figure 1B: sensor molecules "58" labeled with magnetic particles "15" represent the indicator particles); b) letting target components (figure 1B: target sample "57"), if present, bind to the indicator particles and to a contact surface (figure 1B: probe elements "55" provided with binding sites "56" represent the contact surface); c) determining directly or implicitly the distance between indicator

particles and contact surface in a region adjacent to the contact surface and estimating the parameter of interest from said distance (figure 1A; p. 9, par. 1; and claim 11: the distance is measured with a magnetic sensor device and the concentration of magnetic particles is measured).

Consequently, the subject-matter of claim 1 is not new (Article 33(2) PCT).

The same objection can be raised independently using either
D2 (fig. 1: target component: "analyte DNA"; indicator particle: "magnetic marker"; contact surface: "polymer" with "probe DNA"; parameter: concentration of target component; target component binds to indicator particle and contact surface; distance determination via GMR-sensor);
D3 (p. 3679, col. 2, l. 1-30: target component: "collagen type III"; indicator particle: "MAB coupled ferrofluid (MABCFF)"; contact surface: "polystyrene tubes"; parameter: concentration of target component; target component binds to indicator particle and contact surface; distance determination via SQUID-sensor);
D4 (e.g. fig. 2: target component: "biotinylated target DNA"; indicator particle: "streptavidin functionalised magnetic labels"; contact surface: "probe DNA"; parameter: concentration of target component; target component binds to indicator particle and contact surface; distance determination via magnetoresistive sensor);
D5 (p. 4393, l. 17-24; par. "label-free detection experiments" starting on p. 4393: target component: "target"; indicator particle: "competitor"; contact surface: "probe"; parameter: concentration of target component; target component binds to contact surface; distance determination via evanescent field sensor);
D6 (p. 1062, col. 2, par. 2 and 3; p. 1063, col. 1, l. 11-20: target component: "TNT"; indicator particle: "Cy5-DAP-TNP"; contact surface: immobilized anti-TNT-antibody; parameter: concentration of target component; target component binds to contact surface; distance determination via evanescent field sensor);
D7 (scheme 1: target component: "unlabeled complement to Y"; indicator particle: "FRET acceptor"; contact surface: immobilized FRET donor; parameter: sequence of unlabeled target; target component binds to contact surface; distance determination via FRET sensor).

2.1.2 Independent claim 2

Document D1 discloses (the references in parentheses applying to this document):

A sensor system for the detection of a parameter of interest (claim 11: concentration of magnetic particles) that is related to target components in a sample, comprising: a) a sample chamber with a contact surface in which the sample can be provided (figure 1A); b) a quantity of indicator particles that can be distributed in the sample and that do not directly or via target components bind to the contact surface (due to the fact that the target component is not defined, the indicator particles consisting of sensor molecules "58" labeled with magnetic particles "15" as depicted in figure 1B have to be considered as "indicator particles that do not directly or via target components bind to the contact surface", if choosing another target component than target component "57"); c) a sensor element for determining directly or implicitly the distance between indicator particles and contact surface in a region adjacent to the contact surface (figure 1A; p. 9, par. 1; and claim 11: the distance is measured with a magnetic sensor device and the concentration of magnetic particles is measured).

Consequently, the subject-matter of claim 2 is not new (Article 33(2) PCT).

Mutatis mutandis, the same objection can be raised independently using either D2, D3 or D4 (see passages cited for claim 1 and in the search report). Furthermore, the subject-matter of claim 2 is also disclosed by D8 (figure 1 of D8 being identical to figure 8 of the present application).

2.1.3 Claims 3-11

Claims 3-11 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and inventive step, because the features are all known from D1-D8 (see passages cited in the search report).

3 INDUSTRIAL APPLICABILITY (Article 33(4) PCT)

3.1 The subject-matter of claims 1-11 is industrially applicable in the sense of Article

33(4) PCT.

Re Item VIII.

1 The terms (102-402), (101-401) and (112-412) used in claims 1-6, 8 are vague and unclear and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT. In the present opinion, they will be interpreted as referring to (102, 202, 302, 402), (101, 201, 301, 401) and (112, 212, 312, 412), respectively.

2 Some of the features of dependent claims 5-7, 9, 10 ("a force is exerted", "in input light beam is emitted", the indicator particles are magnetized", "the concentration of indicator particles in the sample is measured", "characterized by at least two measurements", respectively) relate to method steps, but corresponding independent claim 2 represents a claim, which is related to an entity, i.e. a sensor system. This renders the subject-matter of said claims unclear in the sense of Article 6 PCT.