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(71) Applicant (for all designated States except US): **GRYPH-ICS, INC.** [US/US]; 3850 Annapolis Lane North, Suite 140, Plymouth, MN 55447 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **RATHBURN, James** [US/US]; 6075 76th Lane, Greenfield, MN 55357 (US). **CAVEGN, Martin** [US/US]; 2454 Shryer Avenue East, North St. Paul, MN 55109 (US).

(74) Agents: **SCHWAPPACH, Karl, G.** et al.; 2200 Wells Fargo Center, 90 South Seventh Street, Minneapolis, MN 55402-3901 (US).

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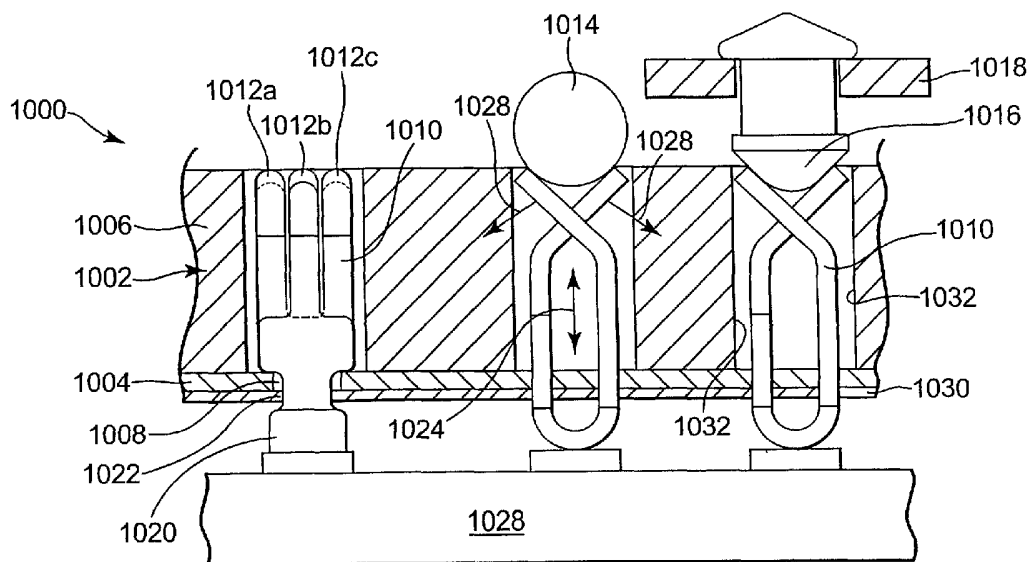
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[Continued on next page]

(54) Title: ELECTRICAL INTERCONNECT ASSEMBLY WITH INTERLOCKING CONTACT SYSTEM



(57) Abstract: An electrical interconnect assembly for electrically interconnecting terminals on a first circuit member with terminals on a second circuit member. The electrical interconnect assembly includes a housing having a plurality of through openings extending between a first surface and a second surface. A plurality of electrical contact member are positioned in a plurality of the through openings. The contact members have at least one engagement feature forming a snap-fit relationship with the housing. A stabilizing structure on the housing limits deflection of the contact members in at least one direction.

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INTERNATIONAL SEARCH REPORT

International Application No
 JS2004/022886

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H05K7/10

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 H05K H01R

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)

EPO-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 6 315 576 B1 (NEIDICH DOUGLAS A) 13 November 2001 (2001-11-13)	1
A	column 5, line 24 - column 9, line 24; figures 1-10	23
Y		20
X	US 6 345 987 B1 (MORI TERUYUKI ET AL) 12 February 2002 (2002-02-12)	1,2
A	column 2, line 19 - column 3, line 57; figures 1-3	25
X	US 5 044 992 A (MALLOY JAMES W ET AL) 3 September 1991 (1991-09-03)	22,24
Y	column 2, line 33 - column 4, line 41; figure 1A column 3, lines 12-24; figure 1A	20
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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
- "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

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European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Arenz, R

INTERNATIONAL SEARCH REPORT

International Application No
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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 6 394 819 B1 (SCHOLZ JAMES PAUL ET AL) 28 May 2002 (2002-05-28) column 3, line 45 - column 4, line 24; figures 2,10	22,24
A	----- EP 0 817 319 A (JOHNSTECH INT CORP) 7 January 1998 (1998-01-07) the whole document -----	1,22

INTERNATIONAL SEARCH REPORT

ational application No.
PCT/US2004/022886

Box 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 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 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.:

1-4, 16, 20, 22-28, 39

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. claim: 1

Independent claim 1 concerns:

"...an electrical interconnect assembly for electrically interconnecting terminals on a first circuit member with terminals on a second circuit member, the electrical interconnect assembly comprising:
a housing having a plurality of through openings extending between a first surface and a second surface;
a plurality of electrical contact member positioned in a plurality of the through openings, the contact members having at least one engagement feature forming a snap-fit relationship with the housing; and
a stabilizing structure on the housing that limits deflection of the contact members in at least one direction..."

1.1. claim: 22

Independent claim 22 concerns:

"...An electrical interconnect assembly for electrically interconnecting terminals on a first circuit member with terminals on a second circuit member, the electrical interconnect assembly comprising:
a housing having a plurality of through openings extending between a first surface and a second surface;
a plurality of electrical contact member positioned in a plurality of the through openings and having an interlocking relationship with the housing;
a stabilizing structure on the housing that limits deflection of the contact members in at least one direction;
and
a sealing layer substantially sealing the through openings between the contact members and the housing..."

1.2. claims: 2,3,26,27

The additional features of claims 2,3,26,27 concern the snap-fit relationship permitting the contact member to move relative to the housing.

1.3. claim: 20

The additional feature of claims 20 concerns the electrical interconnect assembly of claim 1, comprising a sealing layer.

1.4. claims: 4,28

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

The additional feature of claims 4 and 28 concerns the electrical interconnect assembly of claim 1, respectively 22, comprising at least one elastomeric member positioned to bias the contact member toward the first surface.

1.5. claims: 16,39

The additional feature of claims 16 and 39 concerns the electrical interconnect assembly of claim 1, respectively 32, wherein the plurality of through openings are arranged in a two-dimensional array.

1.6. claims: 23,24

The additional features of claims 23,24 concern the interlocking relationship comprising a snap-fit resp. a press-fit relationship.

1.7. claim: 25

The additional feature of claim 25 concerns the contact members being crimped onto the housing.

2. claims: 5,29

The additional feature of claims 5 and 29 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the stabilizing structure limits deflection of the contact member in at least two directions.

3. claims: 6,30

The additional feature of claims 6 and 30 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein at least one of the surfaces of the housing includes at least one device site corresponding to one of the circuit members.

4. claims: 7,31

The additional feature of claims 7 and 31 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein distal ends of the electrical contact members have shapes that corresponds to shapes of terminals on one of the circuit members.

5. claims: 8,45

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

The additional feature of claims 8 and 45 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the through openings comprise a non-moldable feature.

6. claims: 9,12,13,14,32,33,34,35

The additional feature of claims 9,12,13,14,32,33,34 and 35 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the housing comprises a multi-layered structure.

7. claims: 10,36

The additional feature of claims 10 and 36 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the electrical contact members are electrically coupled to the first surface using one or more of a compressive force, solder, a wedge bond, a conductive adhesive, an ultrasonic bond, a wire bond, and a mechanical coupling between the contact members and the first circuit member.

8. claims: 11,37

The additional feature of claims 11 and 37 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the electrical contact members form a snap-fit relationship with electrical contacts on one of the circuit members

9. claims: 15,38

The additional feature of claims 15 and 38 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the electrical contact members comprise a larger cross section proximate a first distal end than at a second distal end.

10. claims: 17,18,40,41

The additional feature of claims 17,18 and 40,41 concerns the electrical interconnect assembly of claim 1(17), respectively 22 (40), comprising an extraction layer.

11. claims: 19,42

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

The additional feature of claims 19 and 42 concerns the electrical interconnect assembly of claim 1, respectively 22, comprising an intermediate contact set located between the contact members and contacts on the first circuit member.

12. claims: 21,43

The additional feature of claims 21 and 43 concerns the electrical interconnect assembly of claim 1, respectively 22, wherein the contact member comprises:
a pair of beams connected at a center portion in a U-shaped configuration; and
a pair of opposing protrusions located near the center portion forming an enlarged opening, wherein the protrusions releasably couple the enlarged opening with a member on the housing.

13. claim: 44

The additional feature of claim 44 concerns the electrical interconnect assembly of claim 22, wherein the housing comprises an upper portion and a lower portion, wherein the interlocking relationship with the contact member is formed by translating the upper portion relative to the lower portion.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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