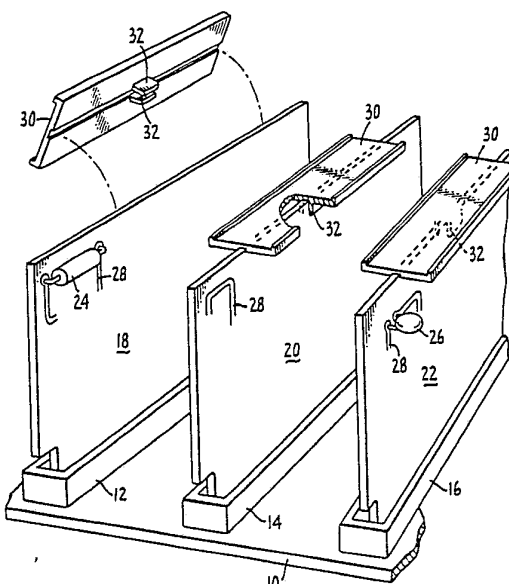


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|   |                  |   |
|---|------------------|---|
| <p>(51) International Patent Classification<sup>4</sup> :<br/><b>H05K 01/18</b></p>   | <p><b>A1</b></p> | <p>(11) International Publication Number: <b>WO 89/ 05087</b><br/>(43) International Publication Date: 1 June 1989 (01.06.89)</p>   |
| <p>(21) International Application Number: PCT/US88/04026<br/>(22) International Filing Date: 9 November 1988 (09.11.88)<br/>(31) Priority Application Number: 121,874<br/>(32) Priority Date: 23 November 1987 (23.11.87)<br/>(33) Priority Country: US<br/>(60) Parent Application or Grant<br/>(63) Related by Continuation<br/>US 121,874 (CIP)<br/>Filed on 23 November 1987 (23.11.87)<br/>(71)(72) Applicant and Inventor: WRIGHT, Carol, Crosby<br/>[US/US]; P.O. Box 456, 590 Nightengale Road, Carnelian Bay, CA 95711 (US).</p> |                  | <p>(74) Agents: LIMBACH, Karl, A. et al.; Limbach, Limbach &amp; Sutton, 2001 Ferry Building, San Francisco, CA 94111 (US).<br/>(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), DK, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.<br/><br/><b>Published</b><br/><i>With international search report.<br/>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> |
| <p>(54) Title: PRINTED CIRCUIT BOARD LABEL HOLDER</p>   |                  |   |
|   |                  |   |
| <p>(57) Abstract<br/>A printed circuit card label holder (30) mounted at the edge of the card (18, 20, 22) when viewed in the plane of the card and supported on the card by fingers (32) which clip onto the card where permitted by electrical components (24, 26) on the card.</p>   |                  |   |

*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

|    |                              |    |  |    |                          |
|----|------------------------------|----|--|----|--------------------------|
| AT | Austria                      | FR | France                                   | ML | Mali                     |
| AU | Australia                    | GA | Gabon                                    | MR | Mauritania               |
| BB | Barbados                     | GB | United Kingdom                           | MW | Malawi                   |
| BE | Belgium                      | HU | Hungary                                  | NL | Netherlands              |
| BG | Bulgaria                     | IT | Italy                                    | NO | Norway                   |
| BJ | Benin                        | JP | Japan                                    | RO | Romania                  |
| BR | Brazil                       | KP | Democratic People's Republic<br>of Korea | SD | Sudan                    |
| CF | Central African Republic     | KR | Republic of Korea                        | SE | Sweden                   |
| CG | Congo                        | LI | Liechtenstein                            | SN | Senegal                  |
| CH | Switzerland                  | LK | Sri Lanka                                | SU | Soviet Union             |
| CM | Cameroon                     | LU | Luxembourg                               | TD | Chad                     |
| DE | Germany, Federal Republic of | MC | Monaco                                   | TG | Togo                     |
| DK | Denmark                      | MG | Madagascar                               | US | United States of America |
| FI | Finland                      |    |  |    |                          |

-1-

PRINTED CIRCUIT BOARD LABEL HOLDER

5

RELATED APPLICATION

This application is a continuation in part of application Serial Number 121,874 filed November 23, 1987.

BACKGROUND OF INVENTION

10

A wide variety of electronic devices are made with printed circuit cards mounted in card positions where different cards may be mounted in any particular card position depending on how someone has decided to configure the particular device. One common example of such devices are the so-called personal computers which have several expansion card slots where the owner may install a variety of optional cards such as memory expansion cards, card mounted disc drives, communication interface cards, and the like.

15

20

A problem may be encountered, particularly by service personnel, in recognizing particular cards installed in such devices when it is necessary to identify a particular card or to understand the manner in which the device has been configured. The components of the card are generally so obscured by adjacent cards that it is difficult to recognize a card from the edge, and service personnel who see many similar devices and who did not configure the particular device cannot identify a card without removing it.

25

30

SUMMARY OF INVENTION

In accordance with this invention, I have developed an identification system for printed circuit cards in which a label identifying the printed circuit card is mounted along the edge of the card in a plane perpendicular to the card where it is visible without removing the card from an array of parallel cards. The label extends laterally from the card a distance which

35

does not exceed the maximum projection of components from the card, that is, the maximum width allocated for an individual card in the card array, so that each card can carry its own identifying label.

5           The preferred mounting means for mounting the label on the printed circuit card is a pair of gripping fingers which are integrally formed with the label holder and which clip onto the edge of the substrate of the printed circuit card at any location permitted by  
10           the locations of components on the card with the label holder body extending along the length of the edge of the card from the gripping fingers. It is extremely important to the invention that the gripping fingers do not penetrate into or through the printed circuit card  
15           so that there is no chance of damaging the electrical components or conductors on the card. It is also important to the invention that the gripping fingers are much smaller than the length of the label holder body so that a location can be found for the gripping fingers  
20           along the edge of crowded cards without interfering with components projecting from the cards.

          A search of the prior art in Class 428, subclasses 901,192 and 209, Class 174, subclass 112, Class 361, subclass 412, and Class 40, subclass 316 uncovered the  
25           following U. S. Patents: 2,818,168; 4,244,125; 4,418,467; 4,450,024; 4,542,441; 4,569,001, and 4,656,767, none of which disclosed the concepts of this invention. Additionally, Schmall 3,919,738 and Southcott et al 3,212,123 show handles for printed  
30           circuit cards, which may contain a label, but which penetrate the surface of the card (Schmall) or the entire card (Southcott et al), and the following patents may be considered also: US# 4,652,769; US# 4,107,760; US# 3,631,299; US# 4,542,441; US# 4,574,332;  
35           US# 1,154,556; European # 144, 675; France # 1,156,444, Switzerland # 364,539, and Germany # 883,005.

DETAILED DESCRIPTION

Fig. 1 is a perspective view of three printed circuit cards mounted on a single mother board with each card carrying a label holder of this invention, one of which is shown in exploded view,

Fig. 2 is an end view of the label holder shown in exploded view in Fig. 1.

The typical printed circuit board arrangement shown in the drawing includes a mother board 10 carrying a plurality of printed circuit card connectors 12, 14, and 16 which carry printed circuit cards 18, 20, and 22. Each printed circuit card contains a substrate carrying electrical components such as 24 and 26 and conductors 28, and each printed circuit card is designed to fit within a standard volume with the components projecting from one side of the card toward the adjacent card by a maximum distance which is here the distance between the connectors 12 and 14. In this way each of the cards 18, 20, and 22 can be mounted in any of the connectors 12, 14, and 16.

The label holder illustrated in the drawing includes a body 30 and a pair of gripping fingers 32 clipped onto the substrate of the printed circuit card. The body 30 and fingers 32 are preferably made integral with each other molded of a resilient, non-electrically conductive plastic material such as polycarbonate plastic. The fingers are inserted onto the edge of the printed circuit card at locations permitted by the components on the card. The label holder is provided with a label identifying the printed circuit card either by writing on the label holder or by mounting an adhesive label on the label holder.

Obviously, many modifications of the details of the design can be made without departing from the following claims.

CLAIMS

1. In a printed circuit card having a substrate extending along a plane and a plurality of electrical components mounted on the substrate and extending laterally from the plane to a predetermined maximum distance permitting a plurality of such printed circuit cards to be mounted adjacent to each other without interfering with each other, the improvement comprising:

a label holder identifying the printed circuit card; and

mounting means connecting the label holder to the substrate and supporting the label holder in a position perpendicular to the plane along one edge of the substrate and extending from the plane by a distance not exceeding said predetermined maximum distance and means for gripping the opposite faces of the printed circuit card without penetrating the surface of the card or extending through the card with said gripping means having a dimension measured along said edge which is substantially smaller than the length of the label holder measured along said edge.

2. The label holder of claim 1 in which said mounting means consists of a pair of fingers integrally formed with the label holder.

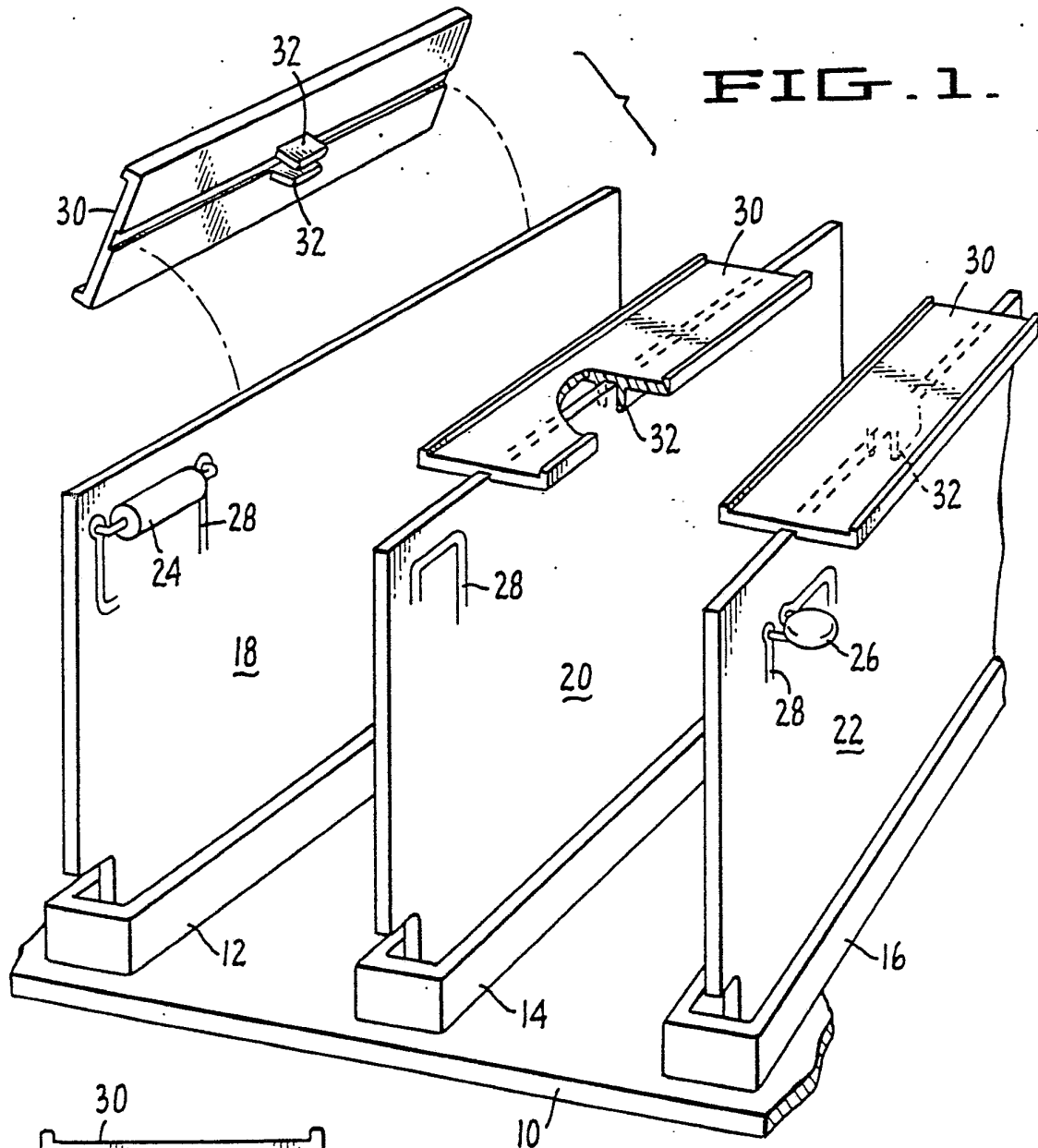


FIG. 1.

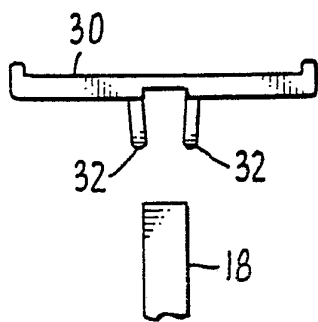


FIG. 2.

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US88/04026

|  |  |                                     |
|--|--|-------------------------------------|
| <b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>  |  |                                     |
| According to International Patent Classification (IPC) or to both National Classification and IPC  |  |                                     |
| IPC (4): H 05 K 01/18  |  |                                     |
| U.S. CL. 361/412   |  |                                     |
| <b>II. FIELDS SEARCHED</b>   |  |                                     |
| Minimum Documentation Searched <sup>7</sup>  |  |                                     |
| Classification System  | Classification Symbols   |                                     |
| U.S.   | 40/360, 489, 901, 902;<br>174/112; 361/399, 412  |                                     |
| Documentation Searched other than Minimum Documentation<br>to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>  |  |                                     |
|  |  |                                     |
| <b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>9</sup>   |  |                                     |
| Category *   | Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup> | Relevant to Claim No. <sup>13</sup> |
| Y  | US, A, 4,079,438 (SCHMALL) 14 March 1978<br>See entire document.   | 1 and 2                             |
| Y  | US, A, 3,919,738 (SCHMALL) 18 November 1975<br>See entire document.  | 1 and 2                             |
| Y  | US, A, 1,540,556 (LAURIE) 02 June 1925<br>See entire document.   | 1 and 2                             |
| Y  | US, A, 4,107,760 (ZIMMER) 15 August 1978<br>See entire document.   | 1 and 2                             |
| Y  | CH, A, 364,539 (VERNEAU) 15 November 1962<br>See entire document.  | 1 and 2                             |
| Y  | US, A, 4,419,838 (TAYLOR) 13 December 1983<br>See entire document.   | 1 and 2                             |
| Y,P  | US, A, 4,745,524 (PATTON) 17 May 1988<br>See entire document.  | 1 and 2                             |
| Y  | DE, A, 883,005 (BOKELMANN) 13 July 1953<br>See entire document.  | 1 and 2                             |
| A,P  | US, A, 4,760,659 (WATABE) 02 August 1988<br>See entire document.   | 1 and 2                             |
| <p>* Special categories of cited documents: <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"&amp;" document member of the same patent family</p> |  |                                     |
| <b>IV. CERTIFICATION</b>   |  |                                     |
| Date of the Actual Completion of the International Search  | Date of Mailing of this International Search Report  |                                     |
| 15 March 1989  | <b>29 MAR 1989</b>   |                                     |
| International Searching Authority  | Signature of Authorized Officer  |                                     |
| ISA/US   | <i>Richard R. Kucia</i><br>RICHARD R. KUCIA  |                                     |



## FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

|   |  |         |
|---|--|---------|
| A | JS, A, 4,301,494 (JORDAN) 17 November 1981<br>See entire document. | 1 and 2 |
| A | JS, A, 4,253,629 (WILMES) 03 March 1981<br>See 8, 9 of fig. 1.     | 1 and 2 |

V.  OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE <sup>1</sup>

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1.  Claim numbers \_\_\_\_\_, because they relate to subject matter <sup>12</sup> not required to be searched by this Authority, namely:

2.  Claim numbers \_\_\_\_\_, 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 <sup>13</sup>, specifically:

3.  Claim numbers \_\_\_\_\_, because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI.  OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING <sup>2</sup>

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

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3.  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 claim numbers:

4.  As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

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