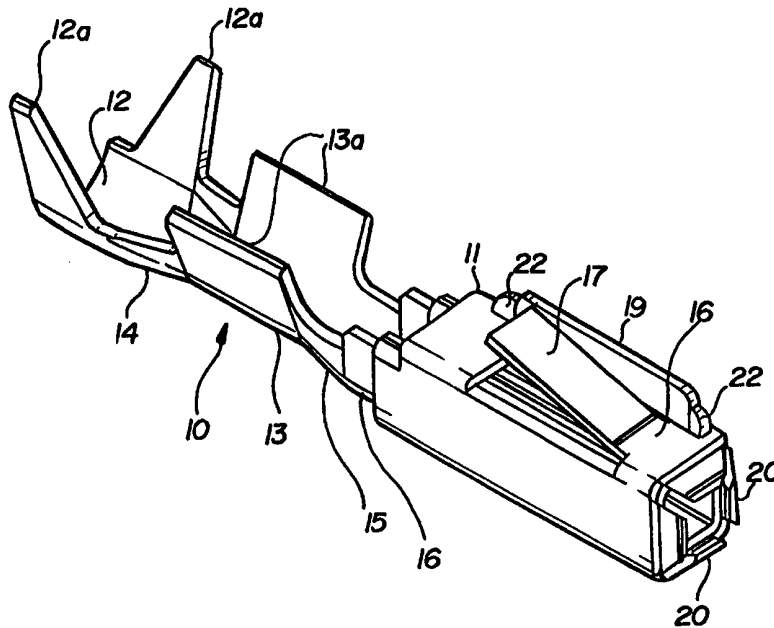




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>H01R 9/09</b>	<b>A1</b>	(11) International Publication Number: <b>WO 99/34482</b> (43) International Publication Date: 8 July 1999 (08.07.99)
<p>(21) International Application Number: PCT/US98/26346</p> <p>(22) International Filing Date: 11 December 1998 (11.12.98)</p> <p>(30) Priority Data: 9703333 24 December 1997 (24.12.97) ES</p> <p>(71) Applicant (for all designated States except US): UT AUTOMOTIVE DEARBORN, INC. [US/US]; 5200 Auto Club Drive, Dearborn, MI 48126 (US).</p> <p>(72) Inventor; and (75) Inventor/Applicant (for US only): ALVAREZ, Andreu Calavera [ES/ES]; Carrer Montagut, 24, E-43206 Reus (ES).</p> <p>(74) Agents: GASKEY, David, J. . et al.; Howard &amp; Howard Attorneys, P.C., Suite 101, 1400 North Woodward Avenue, Bloomfield Hills, MI 48304 (US).</p>		<p>(81) Designated States: MX, US.</p> <p><b>Published</b> <i>With international search report.</i></p>

(54) Title: FEMALE TERMINAL FOR ELECTRONICS WITH A SHEATH



## (57) Abstract

A female terminal for making electronic connections includes a terminal body (16) including a base portion and two lateral walls extending generally perpendicularly from the base and parallel to each other. A sheath (11) includes a generally rectangular configuration with open longitudinal ends. Two of the lateral walls of the sheath include extensions. The extensions slide over and engage terminal ends of the lateral walls of the terminal body (16). The sheath (11) provides a more secure connection between the female terminal and a male terminal and enhances the strength of the female terminal.

**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.

<b>AL</b>	Albania	<b>ES</b>	Spain	<b>LS</b>	Lesotho	<b>SI</b>	Slovenia
<b>AM</b>	Armenia	<b>FI</b>	Finland	<b>LT</b>	Lithuania	<b>SK</b>	Slovakia
<b>AT</b>	Austria	<b>FR</b>	France	<b>LU</b>	Luxembourg	<b>SN</b>	Senegal
<b>AU</b>	Australia	<b>GA</b>	Gabon	<b>LV</b>	Latvia	<b>SZ</b>	Swaziland
<b>AZ</b>	Azerbaijan	<b>GB</b>	United Kingdom	<b>MC</b>	Monaco	<b>TD</b>	Chad
<b>BA</b>	Bosnia and Herzegovina	<b>GE</b>	Georgia	<b>MD</b>	Republic of Moldova	<b>TG</b>	Togo
<b>BB</b>	Barbados	<b>GH</b>	Ghana	<b>MG</b>	Madagascar	<b>TJ</b>	Tajikistan
<b>BE</b>	Belgium	<b>GN</b>	Guinea	<b>MK</b>	The former Yugoslav Republic of Macedonia	<b>TM</b>	Turkmenistan
<b>BF</b>	Burkina Faso	<b>GR</b>	Greece	<b>ML</b>	Mali	<b>TR</b>	Turkey
<b>BG</b>	Bulgaria	<b>HU</b>	Hungary	<b>MN</b>	Mongolia	<b>TT</b>	Trinidad and Tobago
<b>BJ</b>	Benin	<b>IE</b>	Ireland	<b>MR</b>	Mauritania	<b>UA</b>	Ukraine
<b>BR</b>	Brazil	<b>IL</b>	Israel	<b>MW</b>	Malawi	<b>UG</b>	Uganda
<b>BY</b>	Belarus	<b>IS</b>	Iceland	<b>MX</b>	Mexico	<b>US</b>	United States of America
<b>CA</b>	Canada	<b>IT</b>	Italy	<b>NE</b>	Niger	<b>UZ</b>	Uzbekistan
<b>CF</b>	Central African Republic	<b>JP</b>	Japan	<b>NL</b>	Netherlands	<b>VN</b>	Viet Nam
<b>CG</b>	Congo	<b>KE</b>	Kenya	<b>NO</b>	Norway	<b>YU</b>	Yugoslavia
<b>CH</b>	Switzerland	<b>KG</b>	Kyrgyzstan	<b>NZ</b>	New Zealand	<b>ZW</b>	Zimbabwe
<b>CI</b>	Côte d'Ivoire	<b>KP</b>	Democratic People's Republic of Korea	<b>PL</b>	Poland		
<b>CM</b>	Cameroon	<b>KR</b>	Republic of Korea	<b>PT</b>	Portugal		
<b>CN</b>	China	<b>KZ</b>	Kazakstan	<b>RO</b>	Romania		
<b>CU</b>	Cuba	<b>LC</b>	Saint Lucia	<b>RU</b>	Russian Federation		
<b>CZ</b>	Czech Republic	<b>LI</b>	Liechtenstein	<b>SD</b>	Sudan		
<b>DE</b>	Germany	<b>LK</b>	Sri Lanka	<b>SE</b>	Sweden		
<b>DK</b>	Denmark	<b>LR</b>	Liberia	<b>SG</b>	Singapore		
<b>EE</b>	Estonia						

## **FEMALE TERMINAL FOR ELECTRONICS WITH A SHEATH**

### **BACKGROUND OF THE INVENTION**

5           The present invention generally relates to terminals designed for electronic circuits that utilize a small amperage level running through the circuits. Such circuits need contact elements manufactured with an extreme accuracy and allowing contact zones provided in the terminal itself in a small space. Additionally, protection zones should be provided in the corresponding  
10 sheath, which wraps the terminal protecting it against the undesirable effects of outside contaminants exterior to the sheath. Additionally, the sheath should serve to retain the terminal in a corresponding body and connector.

          There exists in the market and therefore may be considered the state of the art a plurality of female terminals, the function of which is that of being  
15 placed on the free ends of the corresponding electric wires that have had the corresponding electric sheath in the area where the union point of the terminal is made.

          Such female terminals typically cover the function of contacting with other male terminals crimped to the ends of the corresponding electric wires.

20           Such male and female terminals, after making contact, are typically placed by suitable means in the interior of corresponding bodies or cavities provided to that effect in the corresponding connectors in which are centralized a plurality of the male and female terminals.

          Some of the conventional female terminals are designed in such a way  
25 that the body of the female terminal itself is shaped in such a way that allows a certain degree of protection against the exterior agents of the contact zones, however, their usefulness and effectiveness is limited.

          The present invention has the object of providing an improved, new  
30 female terminal, intended for electronic circuits, provided with the corresponding sheath, which carries out the function of some portions of

female terminals actually in the market and providing a protection zone inherent to the terminal itself.

### **SUMMARY OF THE INVENTION**

5

The female terminal of this invention is basically formed with zones allowing the setting of the terminal to the corresponding electric wire and its conductive portion. A body of the terminal itself preferably has a generally U-shaped cross-section that has been specifically designed for being capable  
10 of being set in the corresponding sheath. The sheath preferably has a generally rectangular configuration with parallel walls and is designed in such a way that two of the lateral walls of the sheath include a fold that serves as a setting element with the corresponding lateral walls of the terminal's body. The lateral walls of the terminal and sheath thus serve as guiding and setting  
15 elements in the joining of both.

Other details and characteristics of the present invention will be manifest through the reading of the following detailed description, in which reference is made to the figures attached to this description where the above details are depicted in a rather schematic way. These details are given as an  
20 example, referring to a case of a possible practical embodiment, and this invention is not limited to the details outlined. Therefore, this description must be considered from an illustrative point of view and with no limitations whatsoever.

25

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is an upper plan view of a female terminal with a sheath covering the body.

30

Figure 2 is an elevational lateral view of the female terminal of Figure 1.

Figure 3 is a lower plan view of the female terminal of Figure 1.

Figure 4 is a perspective view of the female terminal of Figure 1.

Figure 5 is a perspective view of the female terminal from another view point.

5 Figure 6 is an elevational, cross-sectioned illustration of the female terminal of Figure 1.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

10 As can be seen in Figures 1, 2, 3, 4 and 5, the female terminal 10 is formed with a widened base 12 from which emerge wings 12a alternatively positioned. Extending from the first base 12 is a truncated cone zone 14, which in turn extends as per a narrowed base 13 from which emerge wings 13a. The base 13 in turn merges with a second truncated cone zone 15 opening itself toward the terminal's body 16, which as best can be seen in 15 Figure 6, includes a cross-section in the shape of a "U".

The body 16 of the female terminal preferably has a flat base 16a and lateral walls 16b from which emerge contact planes 21. The sheath 11 preferably includes parallel running walls in a generally rectangular configuration missing the upper and lower bases such that each longitudinal 20 end is opened. The sheath 11 preferably is formed with horizontal bases or walls 11a and 11b related through lateral walls 11c and 11d. The lateral bases and the lateral walls include ears 20 in the form of inclined planes converging generally inwardly from the free edges of each wall or base.

25 From at least one of the lateral bases, preferably the upper one 11a according to Figures 2 and 4, emerges a tongue 17. One of the lateral bases or walls preferably includes an extension 19.

30 The sheath 11 is mounted on the body 16 of the female terminal 10. As can be seen in Figure 6, the lateral walls 11c and 11d fold over themselves with extensions 11cc and 11dd, covering and engaging the lateral walls 16b of the body 16 of the terminal 10.

As can be seen in Figure 6, the terminal 10 is introduced into the sheath 11 in such a way that the measurements of the body 16 slides in its lateral walls 16b by the inside of the extensions 11cc and 11dd produced because of the deformation of the walls 11c and 11d of the sheath 11.

5           In order to establish the corresponding contact with the male terminal (not shown) contact planes 21 emerge from the lateral walls 16b of the body 16 of the female terminal 10.

10           The objects of the sheath 11 manufactured with a material different from that of the terminal include protecting the contact established between the male terminal and the contact plane 21, stiffening at the same time the contact and the male and female terminals, respectively. Since the sheath 11 preferably is manufactured in small dimensions (0.635 mm<sup>2</sup>) and being of a very small size, any force may produce its deformation, and because of that the sheath strengthens the assembly and, at the same time stabilizes the contact  
15           established between the corresponding male terminal and the contact planes 21 emerging from the lateral faces 16b of the body 16 of the terminal 10.

20           It is to be understood that variations to the disclosed example embodiment can be introduced such that any detail modifications regarded as convenient do not depart from the essence of the present invention as summarized in the following claims.

**CLAIMS****WHAT IS CLAIMED IS:**

- 5           1.     A female terminal comprising:  
a first base (12) from which emerge alternatively spaced wings (12a);  
a second base (13) from which emerge wings (13a);  
a first truncated cone zone (14) extending between the first and second  
bases; a second truncated cone zone (15) extending from the second base;
- 10           a terminal body (16) having a generally U-shaped cross-section and  
formed with a base zone (16a) from which emerge perpendicularly lateral  
walls (16b) that each include at least one inclined plane (21); and  
a sheath (11) covering over the lateral walls of the terminal body.
- 15           2.     The female terminal of Claim 1, wherein the sheath (11) has a  
generally rectangular configuration with open longitudinal ends and converging  
portions (20) extending from one end of the sheath (11).
- 20           3.     The female terminal of Claim 2, further comprising a tongue  
(17) supported by and extending from one of the lateral walls.
4.     The female terminal of Claim 3, further comprising an extension  
(19) supported by and extending from one of the lateral walls.
- 25           5.     The female terminal of Claim 1, wherein the lateral walls (11c  
and 11d) include extensions (11cc and 11dd) folding generally inward into the  
sheath and engaging terminal ends of the lateral walls (16b) of the body (16)  
of the terminal (10).

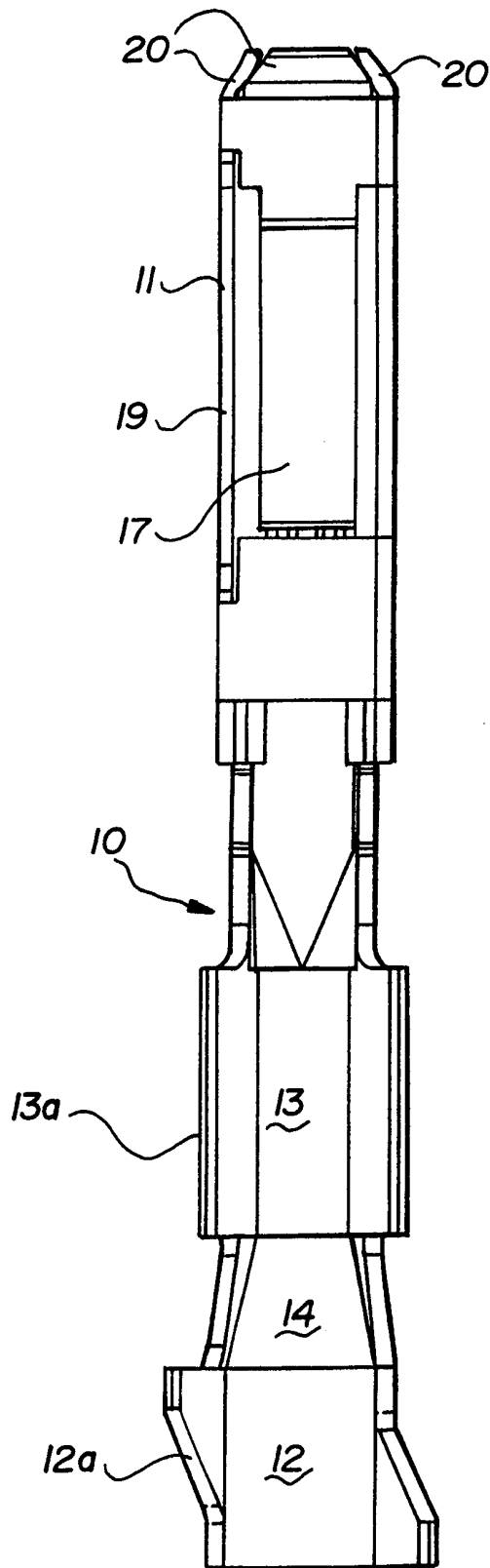


Fig-1

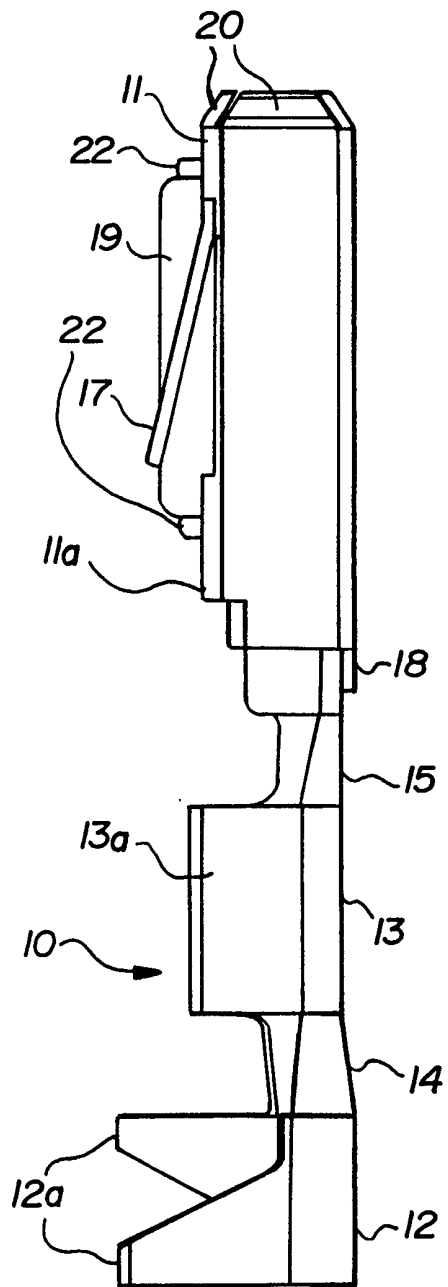


Fig-2



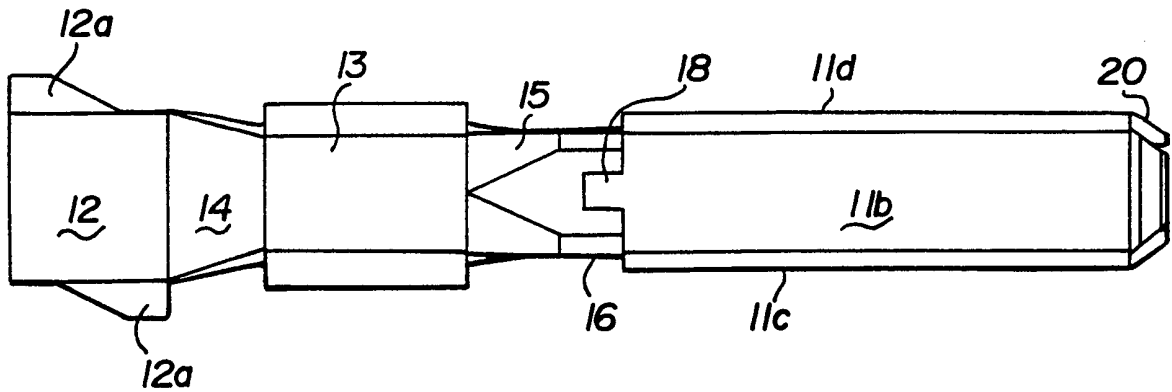


Fig-3

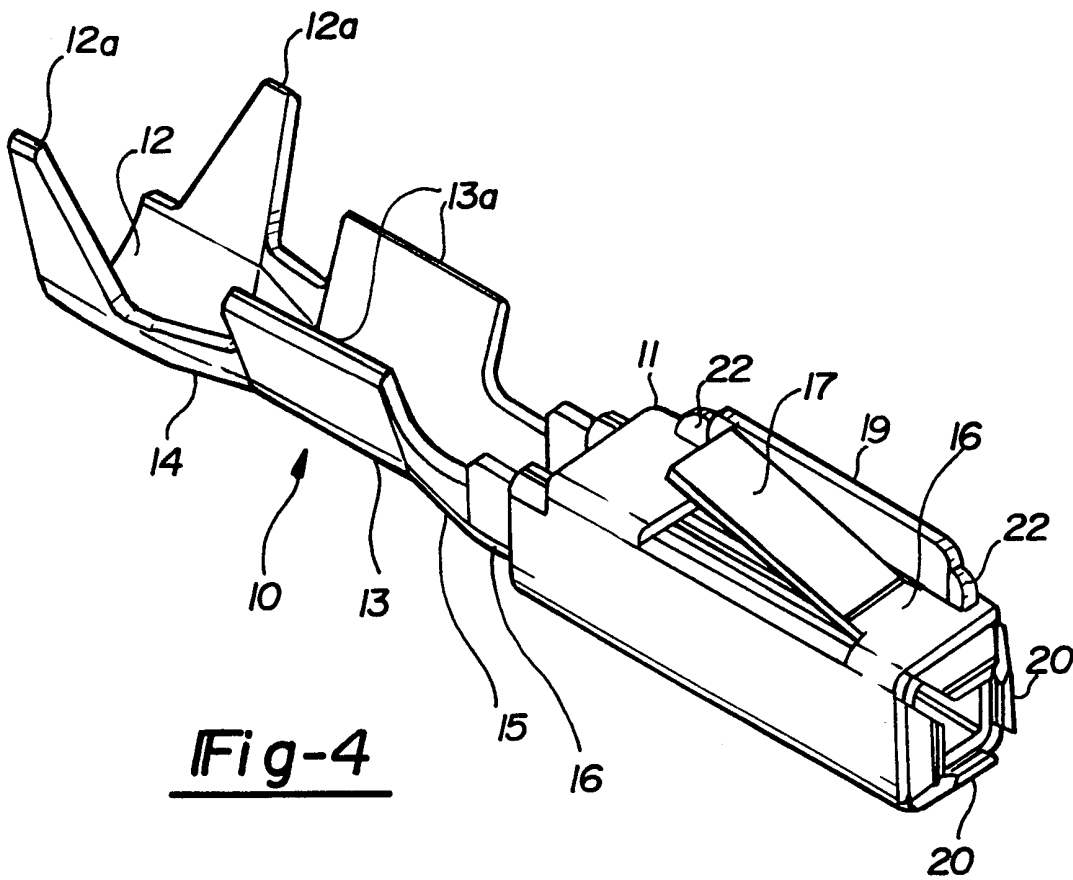
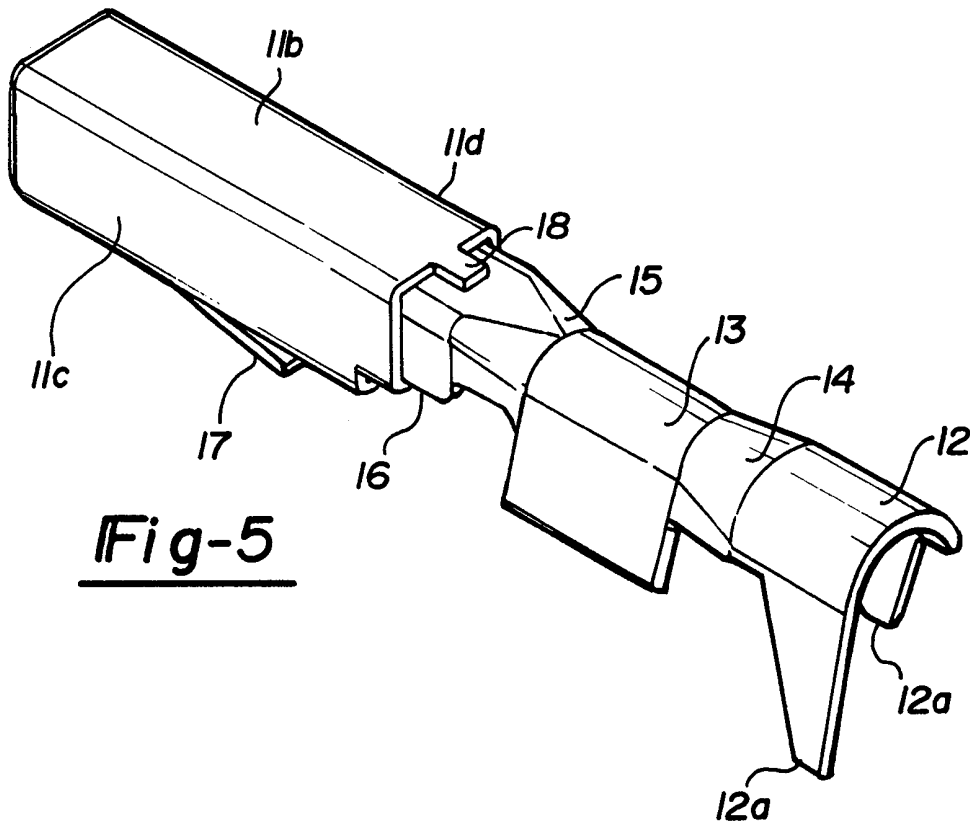
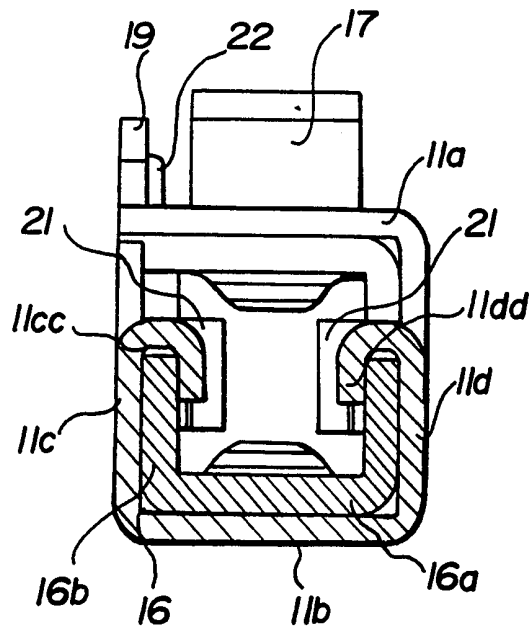


Fig-4



**Fig-5**



**Fig-6**

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/26346

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(6) :HOIR 9/09 US CL : 439/748 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 439/745-749, 752.5		
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)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,695,368 A (JOLY ET AL.) 09 December 1997 (09/12/97), see the entire document.	1 & 5
Y	US 5,711,687 A (KNIPPER MOORE ET AL.) 27 January 1998 (27/01/98), see the entire document	2-4
A	US 5,266,056 A (BADERSCHNEIDER ET AL.) 30 November 1993 (30/11/93), see Figs. 1-5	1-5
A	US 5,624,283 A (HOTEA) 29 April 1997 (29/04/97), See Figs. 1-4.	1-5
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		
Date of the actual completion of the international search 06 FEBRUARY 1999	Date of mailing of the international search report 22 MAR 1999	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer Hien Vu Telephone No. (703) 308-0956	