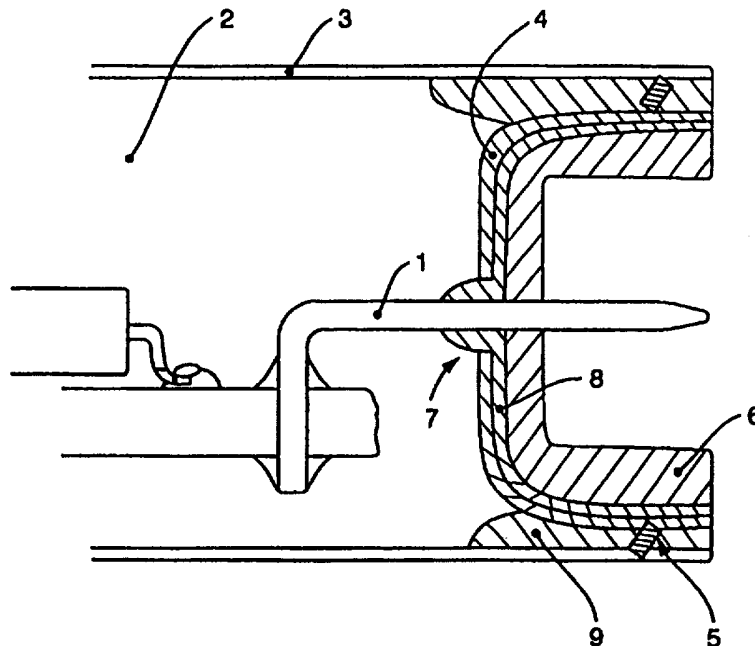




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H01R 13/719, 13/52</p>	<p>A1</p>	<p>(11) International Publication Number: WO 97/48152</p> <p>(43) International Publication Date: 18 December 1997 (18.12.97)</p>
<p>(21) International Application Number: PCT/SE97/00862</p> <p>(22) International Filing Date: 26 May 1997 (26.05.97)</p> <p>(30) Priority Data: 9602359-3 14 June 1996 (14.06.96) SE</p> <p>(71) Applicant: TELEFONAKTIEBOLAGET LM ERICSSON (publ) [SE/SE]; S-126 25 Stockholm (SE).</p> <p>(72) Inventor: LEEB, Karl-Erik; Lillebo, S-130 40 Djurhamn (SE).</p> <p>(74) Agents: BANDELIN, Hans et al.; Telefonaktiebolaget LM Ericsson, Patent and Trademark Dept., S-126 25 Stockholm (SE).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>

(54) Title: AN ELECTRIC CONTACT SEALING ARRANGEMENT AND A METHOD OF ITS MANUFACTURE



(57) Abstract

An arrangement for sealed contact devices and a method of producing the arrangement by laminating a centring device (6) to a barrier layer (4) and conductor pins (1) centred and guided therein with an adhesive plastic material (8), and by forming a combined lid and contact device which is electrically screening an impervious to moisture.

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.

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

**AN ELECTRIC CONTACT SEALING ARRANGEMENT AND A METHOD OF ITS
MANUFACTURE**

FIELD OF INVENTION

5

The present invention relates to an arrangement for sealed electric contact devices and to a method for its manufacture.

DESCRIPTION OF THE BACKGROUND ART

10

Electrical contact devices are vulnerable to humid environments and readily corrode. Modern electronics often operate at such high frequencies as to require the contact devices to be also screened. When screens are used in contact devices, they are often constructed of O-rings and like devices. These devices are bulky, do not seal against radio radiation and are not impervious to the ingress of moisture by diffusion. The attachment of the contact devices to the circuit board constitutes a weak point with regard to both radiation and moisture. Electrical contact devices are often expensive precision engineering structures.

20

SUMMARY OF THE INVENTION

25

The object of the invention is to overcome the problems associated with established techniques.

30

The invention will now be described in more detail with reference to preferred exemplifying embodiments thereof and also with reference to the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

Figure 1 is a cross-sectional view of the invention mounted in a capsule with an electronic circuit.

5

Figure 2 is an enlarged cross-sectional view of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

10

The present invention provides an arrangement which enables the transit of electrically conductive pins 1 from a space 2 enclosed by a capsule 3, wherein the capsule is comprised of a moisture-impervious and electrically conductive material, preferably metal, and with which a barrier layer 4 formed integral with the arrangement is electrically contacted by penetration means 5. An electrically conductive centring means 6 guides the electrically conductive pins 1 in the centre of the holes 7 visibly located in the metallic barrier layer 4, so as to prevent the pins 1 from coming into electric contact with each other or with the screen-tight casing formed by the capsule 3 and the barrier layer 4. The space between the centring means and the barrier layer 4 is filled with a plastic material 8 that adheres to and seals around the conducting pins 1, even in the joint between the barrier layer 4 and the capsule filled with sealing material 9, which may be metal solder or plastic. The arrangement comprising the centring means 6, the barrier layer 4 and the centred pins 1 form a combined lid and contact device 10 that is practically impervious to moisture diffusion for instance, with the capsule 11 forming an impervious screen and moisture-impervious enclosure around the electric circuit 12.

30

The joints 8, 9 may be filled with an ionomer resin (e.g. DuPont Surlyn) to achieve a rapid and simple enclosure, wherein the unique ability of the ionomer resin to generate an ion attraction to the oxide layers present on the barrier layer 4 and the capsule 3 ensure moisture-safe bonds and therewith provide a moisture impervious joint. The capsule 3 may be comprised of a laminate of metal foil and ionomer resin in accordance with known principles, to provide a quick and secure enclosure.

5
10

All metals that form oxide layers bind effectively to ionomer resin, and the centring means 6 may comprise a polyamide that also forms effective bonds with ionomer resin.

15

It will be understood that the invention is not restricted to the aforescribed and illustrated embodiments thereof, and that modifications can be made within the scope of the following Claims.

CLAIMS

1. An arrangement for sealed contact devices, **characterized** by one or more pin conductors (1) centred in spacious holes in a metal barrier layer (4) by means of an insulating centring device (6) and an adherent insulating filling material (8) which joins the centring device (6), the pin conductors (1) and the barrier layer (4) such as to obtain a screening and practically diffusion-tight lid and contact device combination that can be joined to a capsule (3) in an impervious and screening fashion.
2. An arrangement according to Claim 1, **characterized** in that the centring device (6) and the adherent and filling material (8) are an integral unit made of one and the same material.
3. An arrangement according to Claim 1, **characterized** in that the adherent filling material (8) is an ionomer resin.
4. An arrangement according to Claim 3, **characterized** in that the centring device (6) is made of polyamide.
5. A method of manufacturing the arrangement, **characterized** in that the centring device (6) is injection-moulded from polyamide and the barrier layer (4) is made of deep-drawn metal plate; in that the centring device (6) is pressed against the barrier layer (4) with an intermediate ionomer resin layer (8) which is caused to melt in said pressing operation, wherein the ionomer resin layer flows out, fills interspaces and adheres to the conductor pins (1) centred and positioned in the centring device (6) and the barrier layer

(4), therewith joining the centring device (6), the barrier layer (4) and the conductor pins (1) together.

6. A method of manufacturing the arrangement according to
5 Claim 2, **characterized** in that the conductor pins (1) and the
barrier layer (4) are placed in an injection-moulding tool;
and in that the centring device (6) of ionomer resin is
injected-moulded; and in that the parts are joined together
at the injection-moulding temperature by adhesion of the
10 ionomer resin to the barrier layer (4) and the conductor pins
(1), both made of metal with an oxide layer.

1/1

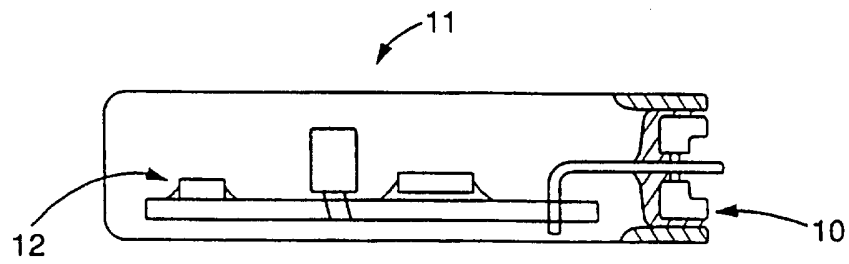


Fig. 1

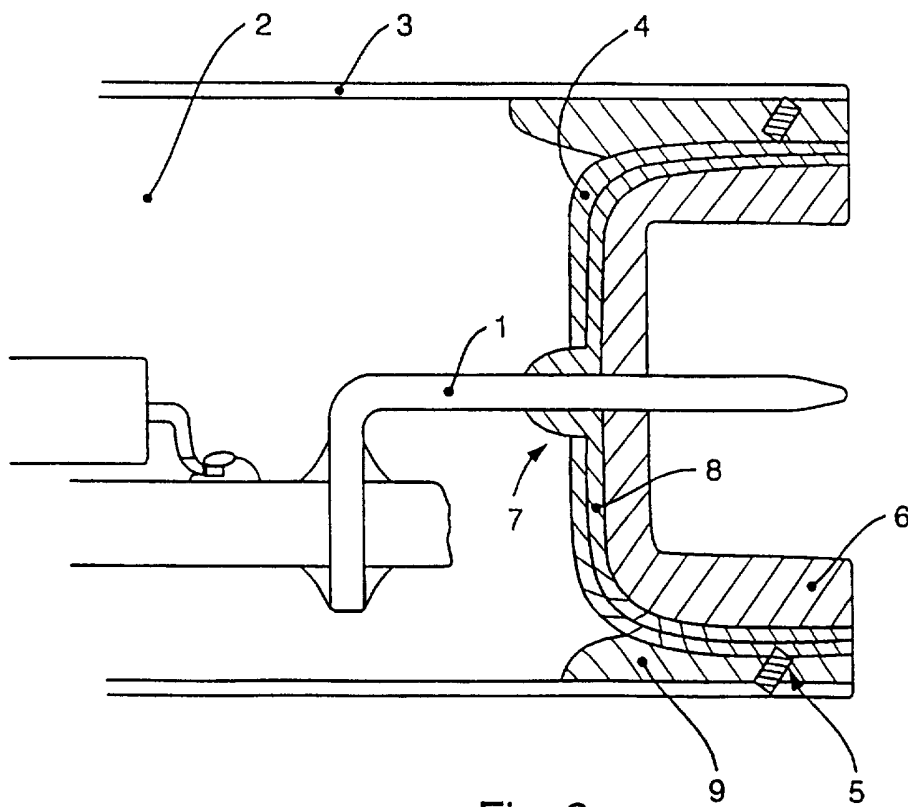


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 97/00862

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H01R 13/719, H01R 13/52

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: H01R

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9409535 A (CONNECTOR SYSTEMS TECHNOLOGY N.V.), 28 April 1994 (28.04.94) --	
A	US 5438160 A (BATTY), 1 August 1995 (01.08.95) --	
A	EP 0382148 A2 (AMP INCORPORATED), 16 August 1990 (16.08.90) --	
A	EP 0239424 A1 (ITT INDUSTRIES INC.), 30 Sept 1987 (30.09.87) --	

 Further documents are listed in the continuation of Box C. See patent family 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

8 Sept 1997

Date of mailing of the international search report

22-09-1997

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Christer Falk
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 97/00862

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0002890 A1 (AMP INCORPORATED), 11 July 1979 (11.07.79) ----- -----	

INTERNATIONAL SEARCH REPORT
Information on patent family members

06/08/97

International application No.
PCT/SE 97/00862

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9409535 A	28/04/94	DE 69302694 D,T	12/12/96
		EP 0664056 A,B	26/07/95
		HK 161596 A	06/09/96
		JP 8502616 T	19/03/96
		NL 9201753 A	02/05/94
		US 5521784 A	28/05/96
		US 5438160 A	01/08/95
EP 0382148 A2	16/08/90	DE 69008558 D,T	18/08/94
		DE 69013177 D,T	16/02/95
		EP 0380315 A,B	01/08/90
		ES 2052081 T	01/07/94
		JP 2194763 A	01/08/90
		US 5061992 A	29/10/91
		JP 2305454 A	19/12/90
		US 4995834 A	26/02/91
EP 0239424 A1	30/09/87	CA 1254959 A	30/05/89
		JP 62180973 A	08/08/87
		US 4657323 A	14/04/87
EP 0002890 A1	11/07/79	SE 0002890 T3	
		CA 1098600 A	31/03/81
		JP 1434553 C	07/04/88
		JP 54091793 A	20/07/79
		JP 62038831 B	19/08/87
		US 4215910 A	05/08/80