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(54) **Remplacement plug**

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ABSTRACT

The present invention relates to RJ-modular plugs, and more specifically to RJ-modular plugs with a broken off latch flap. A device according to the present invention
5 replaces a broken RJ-modular plug and provides a functional plug for insertion into a known RJ-modular socket.

REPLACEMENT PLUG

9.1770

Technical field

- 5 The present invention relates to plugs for of the RJ-modular type, and in particular to replacement plugs for broken plugs of networking cables.

Background of the invention

- 10 Known sockets and plugs of the RJ-modular type are depicted in Figures 1 to 5. RJ-modular plugs and sockets are known from different embodiments, having different sizes and various numbers of electrical contacts. Best known are RJ-11 plugs and sockets, which are nowadays widely used as telephone and ISDN connectors, as well as RJ-45 plugs and sockets, which find their use as Ethernet networking connectors.

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- In a known socket 101 as shown in Figures 1a and 1b, a socket housing 102 provides a box-like plug receiving space 104, of width 113 and height 111. At the ceiling of the receiving space 104, a number of electrical contacts 103 are fixed. The interior of the receiving space 104 has symmetrical features and provides a shoulder 105 on each side. The shoulders 105 have a combined height corresponding to the sum of the heights 107 and 112, as measured from the floor level 110. A narrow mouth at the entry of the receiving space 104 is provided through protrusions 106, which are located on the floor 110 of the receiving space 104. The protrusions 106 have a height 107. The resulting floor space 110 of the socket housing 102 is shown in Figure 1b. It provides for a mouth floor portion of width 109 and a wider back floor portion of a larger width 108 and a depth indicated by 114.

- In a known plug 201, shown in Figures 2 to 4, a plug housing 202 has a substantially box-like shape of width 204 and 205, which substantially match the dimensions 113 and 111 of the receiving space 104. The distal end of the plug 201 comprises contact ridges 203, which are arranged so as to electrically connect to the contacts 103 of the socket 101 when the plug is inserted to the socket. The top part 206 of the plug housing 202 comprises at least one box-shaped recess 207, but the majority of known embodiments features three distinct recesses 207, 211, 215. The first recess 207 as seen from the distal end of the housing 202 has a length 208, a width 209 and a depth

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210. Accordingly, it forms a notch like structure. The second recess 211 has a length 212, which is typically larger than the length 208, a width 213, which is substantially the same as the width 209, and a depth 214, which is shallower than the depth 210. The recesses 207, 211 and 215 are useful in the process of crimping the plug 201 to a
5 cable 222 using a special crimping tool.

As the dimensions of the box-like plug structure match the dimensions of the receiving space 104, the plug rests on the shoulders 105 when inserted into the socket.

10 In order to engage with the socket 101, the box-like plug device 201 comprises a latch flap 217, which extends along the bottom face 216.

The latch flap 217 is fixed at a protrusion 218, which is provided near the connector-end of the plug housing 202. Figure 3 shows a bottom view of the plug showing said
15 latch flap device 217. The latch flap device 217 is arranged to extend away from the bottom face 216 if no external compression force is applied to it. The latch flap device 217 further comprises a distal portion of substantially rectangular shape, having a width 219, and a proximal portion of substantially rectangular shape, having a narrower width 220. This arrangement provides for the existence of corners 221. The
20 widths 219 and 220 are chosen so as to match the widths 108, 109 of the floor 110 of the socket housing 102 respectively.

As illustrated in Figure 5, the latch flap 217 provides a mechanism that allows to firmly, but releasably, engage the plug 201 within the socket 101. On the one hand, as the
25 latch flap 217 fills the vertical space between the shoulders 105 and the floor 110 of the socket housing 102, it applies a pressure to the floor 110. On the other hand, the corners 221 engage with the protrusions 106 and do not allow the plug 201 to be pulled out of the socket 101 inadvertently.

30 Whenever the plug 201 is to be released from the socket 101, the latch flap 217 may be pressed towards the bottom face 216 of the plug device 201, so that the corners 221 are vertically lifted out of their engagement with the protrusions 106. As the vertical downwards pressure of the latch flap 217 on the socket housing floor 110 is relieved at the same time, the plug 201 may then be freely pulled out of the socket
35 101.

The latch flap 217 is the single element that allows the plug 201 to be fastened to the socket 101. At the same time, it is the most fragile element of the plug housing 202. Indeed, an operator who handles unplugged cables that are fitted with plugs of the given type 201, may inadvertently pull on the cable 222 while another cable or a random object is stuck in the space between the latch flap 217 and the bottom face of the plug housing 216, which can be seen in Figure 4. As the latch flap 217 has a fine structure, it will be the first part to give away. With reference to Figure 6, the result is a broken plug housing 202. The latch flap 217 typically breaks away at a point 224 located in the vicinity of the protrusion 218, leaving a portion of the distal end, of width 219 and height 223, fixed to the plug housing 202.

The operator is then confronted with an unusable cable, as the broken plug can no longer be fastened to a socket 101. Indeed the latch flap 217 can no longer fill the vertical space between the shoulder 105 of the receiving space 104, and the floor 110. At the same time, both the cable 222 and plug are still fully electrically functional. If the operator does not want to replace the cable, he has to resort to cutting the plug off the cable and throwing the electrically functional plug away. He then uses a special crimping tool to fix a new plug 201 to the cable. This operation requires time and precision, and the provision of the special tool. It leaves the operator with a shortened cable and a new plug, which presents the same vulnerability as the one he has thrown away.

Technical problem to be solved

It is an objective of the present invention to provide a replacement plug and/or socket device for plugs of the RJ-modular type that present a broken latch flap, and which overcomes at least some of the disadvantages of the prior art.

Summary of the invention

According to the present invention, an electrical socket of a given type is provided for receiving a matching plug. The plug comprises at least one notch structure and a structure resulting from a broken off latch flap. The plug receiving space of said socket may be contained between a top and a bottom surface, characterized in that at least

one of said surfaces comprises at least one protrusion extending sideways from the middle of said surface. These protrusions may engage with the corresponding structures on said plug and they may be oriented towards the plug receiving space.

- 5 The electrical socket may comprise two protrusions on said top surface of the plug receiving space.

The electrical socket may further comprise one protrusion on its bottom surface.

- 10 According to the present invention, an electrical plug of a given type is provided for inserting into a matching socket. The socket may comprise corner protrusions on the floor of its plug receiving space. The plug may comprise a distal and a proximal end, and at least one outer face, characterized in that two arms are extending in the distal-proximal direction along said face. The arms may preferably comprise latch means for
15 engaging with said protrusions on said socket, and compression means for releasing the engagement between said plug and said socket by changing the distance between said arms.

- 20 According to the present invention, an electrical plug adaptor device is provided comprising said electrical socket and said electrical plug. Preferably, electrical connections may be provided, which connect the socket and the plug.

Preferably, spring means may be arranged between the arms. The spring means may preferably be made out of a resilient material.

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More preferably, the adaptor device may comprise a distal end and a proximal end defining an axis. The socket device may be arranged on said axis at said distal end. The plug device may be arranged on said axis at said proximal end.

- 30 Even more preferably, the plug and socket types may correspond to a networking cable plug and socket.

A LED may preferably be arranged in the device so as to emit light when a plug carrying an electrical tension is inserted into the female socket part.

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Most preferably, the device may comprise at least one flat area on at least one of its outer surfaces for sticking a label to it.

5 The device according to the present invention allows receiving a plug of the RJ-modular type that presents a broken latch flap, and provides a functional plug of the RJ-modular type that may be releasably inserted into a known socket 101, while it does not present a latch flap that may break anew.

10 A cable presenting a broken plug may be fixed by inserting it into the device according to the present invention. No special crimping tool is needed and the cable length need not be shortened.

Brief description of the drawings

15 Several embodiments of the present invention are illustrated by way of figures, which do not limit the scope of the invention, wherein:

Figure 1a shows an isometric view of a known RJ-modular female socket.

20 Figure 1b shows a top view of a horizontal cross section of a known RJ-modular female socket, depicting the floor outline.

Figure 2 shows an isometric view of a known RJ-modular male plug.

25 Figure 3 shows a bottom view of a known RJ-modular male plug, depicting the latch flap.

Figure 4 shows a cross sectional side view of a known RJ-modular male plug.

30 Figure 5 shows a cross sectional side view of the engaging mechanism that connects a known RJ-modular male plug to a known RJ-modular female socket.

Figure 6 shows a cross sectional side view of a known RJ-modular male plug wherein the latch flap mechanism is broken.

Figure 7 shows an isometric view of preferred embodiment of a female socket according to the present invention.

5 Figure 8s show an isometric view of an alternative embodiment of a female socket according to the present invention.

Figure 9 shows a cross-sectional side view of an embodiment of a female socket according to the present invention.

10 Figure 10 shows a side view of a preferred embodiment of a male plug according to the present invention.

Figure 11a shows a bottom view of a preferred embodiment of a male plug according to the present invention, wherein the arms are extended.
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Figure 11b shows a bottom view of a preferred embodiment of a male plug according to the present invention, wherein the arms are compressed.

Figure 12a shows a bottom view of an alternative embodiment of a male plug according to the present invention, wherein the arms are extended.
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Figure 12b shows a bottom view of an alternative embodiment of a male plug according to the present invention, wherein the arms are compressed.

25 Figure 13 shows a cross-sectional side view of the engaging mechanism between a male plug according to the present invention and a known RJ-modular female socket.

Figure 14 shows a cross-sectional side view of preferred embodiment of the device according to the present invention, in connection with both a known broken plug device and a known socket device.
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Detailed description of the invention

35 The device according to the present invention presents a male plug part and a female socket part. A preferred embodiment of the female socket part is shown in Figure 7.

In a preferred embodiment, a socket device 301 comprises a housing 302 which has a substantially box-like shape, comprising a top wall 304, a bottom wall 305, and two side walls 306 and 307 respectively. The walls define a plug receiving space 308,
5 which is able to receive a broken plug as depicted in Figure 6. Contact surfaces 303 are fixed to the top wall in the receiving space 308. The contact surfaces 303 are arranged so as to electrically connect with the contact surfaces 203 of an inserted plug device.

10 The interior of the receiving space 308 preferably has symmetrical features and provides a shoulder 314 on both the left and right sides. The shoulders 314 provide for a broad upper portion of the receiving space 308, of height 310 and width 309. These dimensions substantially match the height 205 and width 204 of the plug device 201 as shown in Figures 2 or 6. A narrower lower portion of width 313 and height 311 is
15 provided. The height 311 is substantially equal to height 223 of the broken latch flap device of a plug 201, as depicted in Figure 6.

The resulting floor space 312 extends preferably to the mouth of the receiving space 308 and has a substantially rectangular shape. The floor provides a protrusion 325,
20 which preferably spans the width 313 of the floor 312 of the socket housing 302. The protrusion 325 may as well extend sideways from the middle of the floor 312 and have a width that is smaller than the width 313 of the floor 312. In an alternative embodiment, as shown in Figure 8, the floor space 312 does not extend to the mouth of the receiving space 308.

25 As seen in Figure 9, the protrusion 325 on the floor of the receiving space 308 has a height 327 that is no larger than the height 223 of the broken plug device 201. In a preferred embodiment, the height 327 substantially matches the height 223. The protrusion is preferably located at a distance from the back wall of the receiving space
30 308 that allows the broken latch flap part 219 shown in Figure 6 to be held between the back wall and the protrusion 325. The width 326 at the base of the protrusion 325 may in that case be arbitrary.

As further depicted in Figure 9, the ceiling 304 of the receiving space 308 provides at
35 least one protrusion 315, but preferably two protrusions 315, 320, which are directed

towards the receiving space 308. The dimensions of the protrusions will be explained with reference to both Figures 9 and 4.

5 The width 317 of the first protrusion 315 is selected so as to be no larger than the width 212 of the wider notch 211 in the top part of a male plug 201. The height 318 of the first protrusion 315 is selected so as to be no larger than the depth 214 of the wider notch 211 in the top part of the male plug 201. The protrusions 315 extends sideways from the middle of the ceiling 304 and spans an area on the ceiling of the receiving space 308 that is no wider than the width 213 of the wider notch 211 in the
10 top part of the male plug 201

Similarly, the width 322 of the second protrusion 320 is selected so as to be no larger than the width 208 of the narrow notch 207 in the top part of a male plug 201. In a preferred embodiment, the width 322 substantially matches the width 208.

15 The height 323 of the second protrusion 320 is selected so as to be no larger than the depth 210 of the narrow notch 207 in the top part of a male plug 201.

The protrusion 320 spans an area on the ceiling of the receiving space 308 that is no wider than the width 209 of the narrow notch 207 in the top part of the male plug 201

20 The protrusions 315, 320, 325 may preferably have a triangular cross section, as shown in Figure 9. The cross section of any of the protrusions 315, 320, 325 may however also provide a concave slope 319, 324, 328, or a slope of arbitrary shape.

The structure of the female socket device 301 according to the present invention
25 allows receiving a broken male plug device 201 such as the one depicted in Figure 6. The protrusions 315, 320 and 325 located on the floor and ceiling of the receiving space 308 respectively form a claw-like structure, which engages with the broken protrusion 219 at the bottom, and with the notch structures 207 and 211 at the top of the broken male plug 201. This allows the broken plug device 201 to be firmly plugged
30 into the socket device 301 without the presence of the latch flap device.

In a preferred embodiment of the present invention, the male plug part 401, as shown in Figures 10 to 13, provides a housing 402 comprising electrical contacts 403 at its distal end, similar to the contacts 203 on the known plug device 201.

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The different features of the male plug part 401 will be understood with reference to Figures 10 to 13, and to Figures 1a and 1b which represent the known socket device 101.

5 The plug 401 is releasably insertable into a known female socket device 101 of the RJ-modular type. The plug 401 has a substantially box-like shape of height 405 and width 417. The dimensions are selected so as to substantially match the width 113 and height 111 of the upper portion of the receiving space 104. The contacts 403 are arranged so as to electrically connect to the contact surfaces 103 when the plug
10 device 401 is inserted into the socket device 101. In order to be releasably insertable into a known socket 102 of the RJ-modular type, the bottom face 404 of the male plug part 401 needs to provide latch means that are capable of releasably engaging with the protrusions 106 on the floor 110 of the socket's receiving space 104.

15 In a preferred embodiment, two compressible arms 408, 409 are provided, extending along the bottom face 404 of the plug device housing 402. The arms 408, 409 add a height 406 to the overall housing, which preferably corresponds substantially to the height 112 as shown in Figure 1a. The arms 408, 409 are preferably fixed at the distal end of the bottom face 404.

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As shown in Figure 11a, in a preferred embodiment, the uncompressed arms 408, 409 are preferably spaced at a distance 416, which is no larger than the width 108 of the socket's floor 110 shown in Figure 1b.

25 Both arms provide a protrusion 410, 411, which adds an additional height 407 to the overall height of the plug device 401, as seen in Figure 10. The height 407 corresponds substantially to the height 107 of the corner protrusions 106 depicted in Figure 1a. The maximum distance 414 between the distal ends of the protrusions 410, 411 is smaller than the width 108 of the socket's floor 110 shown in Figure 1b, and
30 larger than the width 109 of the narrow mouth.

Moreover, the protrusions 410, 411 are located at a distance 418 from the distal end of the plug, which corresponds essentially to the depth 114 of the wide area of the floor space 110 of the socket 101.

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The arms 408, 409 further provide compression means 412, 413, which allow to reduce the distance between the protrusions 410, 411 from 414 to 415, as shown in Figure 11b. The distance 415 is no larger than the width 109 of the narrow mouth of the receiving space 108 of the socket 101.

5

As shown in Figure 13, the proposed structure allows the protrusions 410, 411 to act as latch means, which engage behind the protrusions 106 on the floor 110 of the socket's receiving space 104. Hence the proposed male plug device 401 may be releasably, yet firmly, inserted into the socket 101. By compressing the arms 412, 413, the latch means 410, 411 release their engagement with the protrusions 106 and the plug device 401 may be unplugged from the socket 101. As the latch means do not comprise a latch flap that extends away from the bottom surface 404 of the housing 402, but feature arms that extend substantially along said surface, the risk of breaking them off is greatly reduced as compared to the known plug 201.

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An alternative embodiment of a male plug 501 according to the present invention is shown in Figures 12a and 12b, which depict the bottom face 504 of the housing 502 of width 519, as well as the arm structure 508, 509 in extended state and compressed state respectively.

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The arms 508, 509 add a height to the overall housing, which preferably corresponds substantially to the height 112 as shown in Figure 1a. The arms 508, 509 are preferably fixed at the distal end of the bottom face 504.

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As shown in Figure 12a, in an alternative embodiment, the uncompressed arms 508, 509 are preferably spaced at a distance 516, which is no larger than the width 108 of the socket's floor 110 shown in Figure 1b.

30

Both arms provide a protrusion 510, 511, which adds an additional height to the overall height of the plug device 501. The maximum distance 514 between the distal ends of the protrusions 510, 511 is smaller than the width 108 of the socket's floor 110 shown in Figure 1b, and larger than the width 109 of the narrow mouth.

Moreover, the protrusions 510, 511 are located at a distance 518 from the distal end of the plug, which corresponds essentially to the depth 114 of the wide area of the floor space 110 of the socket 101.

- 5 The arms 508, 509 further provide compression means 512, 513, which allow to reduce the distance between the protrusions 510, 511 from 514 to 515, as shown in Figure 12b. The distance 515 is no larger than the width 109 of the narrow mouth of the receiving space 108 of the socket 101.
- 10 Spring means 517 may further be provided between the arms 508 and 509. The spring means 517 make sure that the arms extend when no compressive force is applied to the compression means 512 and 513.

The skilled man will be able to implement different arm shapes and compression
15 means that perform the same function.

Figure 14 shows a preferred embodiment of the device according to the present invention in connection with both a broken plug device 201 and a known socket device 101. The device according to the invention includes the described female and male
20 parts 301, 401, which are electrically connected by connection means 420. This allows mirroring the electrical connections 203 of a broken plug device 201 that is plugged into the socket 301, on the contact surfaces 403 of the male part of the invented device.

- 25 Preferably, both parts 301, 401 of the device are aligned on an axis, such as to provide a distal and a proximal end of the device respectively.

The device may be moulded out of a synthetic resin material, which may be in a specific colour. Other production methods will be known to those skilled in the art.

30 Known RJ-modular plugs 201 are most often transparent as the operator needs to see the electrical contacts inside the plug housing 202 when he crimps the plug 201 onto a cable. The device according to the present invention may be produced in different opaque colours as it does not have to be crimped onto a cable. By using different

colours for different cable ends, the operator will be able to use colour codes in order to identify the cables according to their use.

5 It is further preferred to include a Light Emitting Diode (LED) into the device. The LED is connected so as to emit light when a plug 201 carrying an electrical tension is inserted into the female socket part 301 of the device.

The device may further provide at least one flat surface on one of its outer surfaces, which allows a label to be put on the device.

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The device according to the present invention allows recycling a broken RJ-modular type male plug by plugging it into the device. The cable end is thus provided with a new male plug part 401 that mirrors the electrical contacts of the original, but broken plug 201. In this way, the broken plug 201 can be fixed without the use of a special
15 tool. Moreover the new male plug part 401 provides latching means that are less prone to breaking than the original latch flap of plug 201.

It should be understood that the detailed description of specific preferred embodiments is given by way of illustration only, since various changes and modifications within the
20 scope of the invention will be apparent to the skilled man. The scope of protection is defined by the following set of claims.

CLAIMS

1. An electrical socket (301) of a given type for receiving a matching plug (201),
5 wherein the plug (201) comprises at least one notch structure (211) and a
structure (224) resulting from a broken off latch flap (217), wherein the plug
receiving space (308) of said socket (301) is contained between a top and a
bottom surface (304, 305), characterized in that at least one of said surfaces
(304, 305) comprises at least one protrusion (315, 325) extending sideways from
10 the middle of said surface, for engaging with a corresponding structure (211,
224) on said plug, and wherein said at least one protrusion (315, 325) is oriented
towards the plug receiving space (308).
2. An electrical socket (301) according to claim 1, wherein the top surface (304)
15 comprises two protrusions (315, 322).
3. An electrical socket (301) according to any of the preceding claims, wherein the
bottom surface (305) comprises one protrusion (325).
4. An electrical plug (401, 501) of a given type for inserting into a matching socket
20 (101), wherein the socket comprises corner protrusions (106) on the floor (110)
of the plug receiving space (104), and wherein the plug (401, 501) comprises a
distal and a proximal end, at least one outer face (404, 504), characterized in
that two arms (408, 409; 508, 509) are extending in the distal-proximal direction
along said face, said arms comprising latch means (410, 411; 510, 511) for
25 engaging with said protrusions (106) on said socket, and said arms further
comprising compression means (412, 413; 512, 513) for releasing the
engagement between said plug and said socket by changing the distance
between said arms.
- 30 5. A device according to claim 4, wherein spring means (517) are arranged
between the arms (508, 509).
6. A device according to claim 5, wherein the spring means (517) are made from a
resilient material.

- 5 7. An electrical plug adaptor device comprising the socket (301) according to any of claims 1 to 3 and the plug (401, 501) according to any of claims 4 to 5, and further comprising electrical connections (420), which connect the electrical connectors in the socket to the plug corresponding electrical connectors in the plug.
- 10 8. A device according to claim 7, comprising a distal end and a proximal end defining an axis, wherein the socket (301) is arranged on said axis at said distal end, and wherein the plug (401) is arranged on said axis at said proximal end.
9. A device according to any of the preceding claims, wherein the plug and socket types correspond to a networking cable plug and socket.
- 15 10. A device according to any of the preceding claims, wherein a LED is arranged so as to emit light when a plug (201) carrying an electrical tension is inserted into the female socket part (301).
- 20 11. A device according to any of the preceding claims, wherein the device comprises at least one flat area on at least one of its outer surfaces, to which a label may be attached.

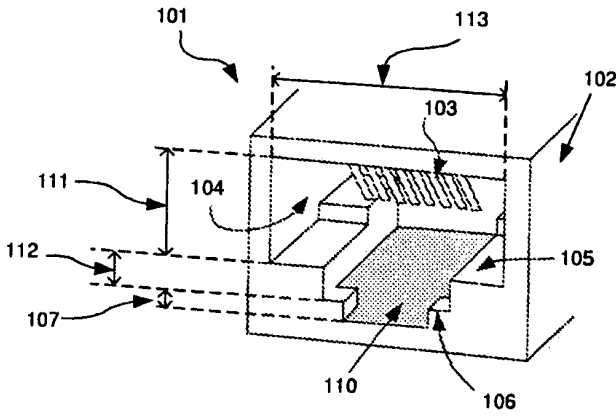


Fig 1a

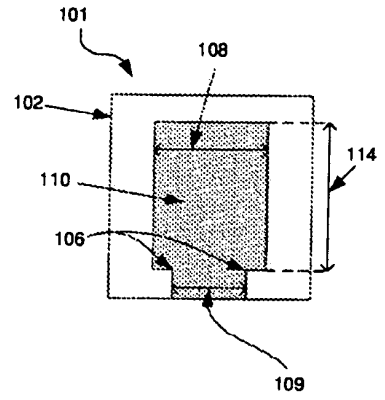


Fig 1b

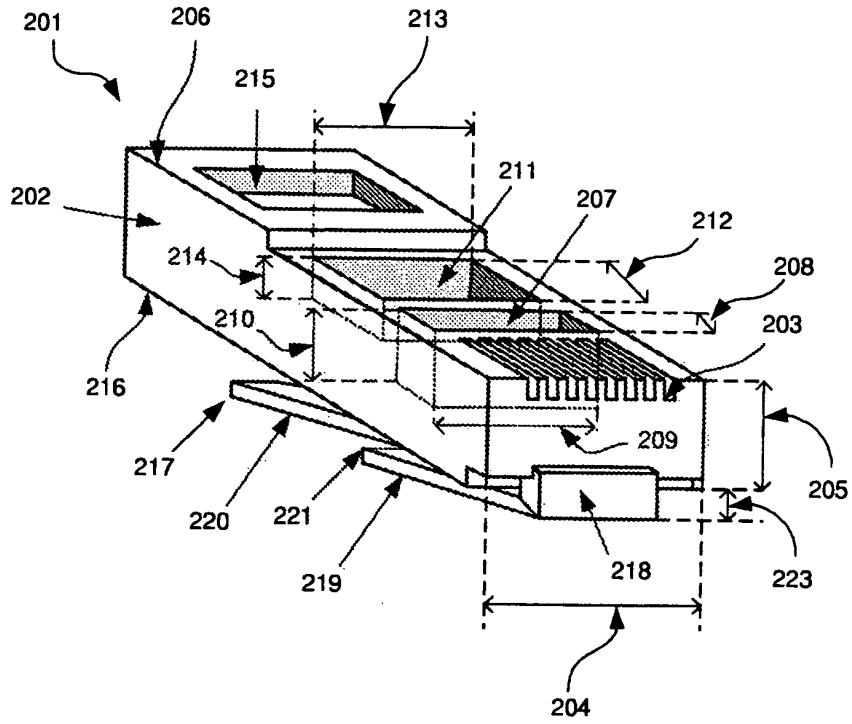


Fig 2

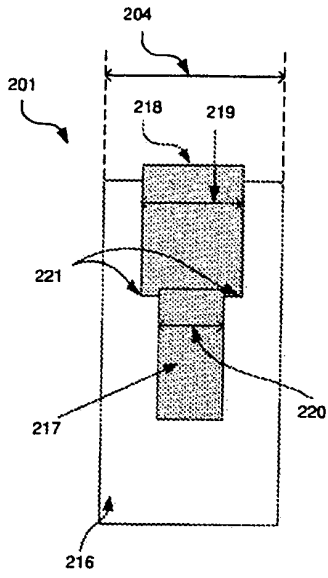


Fig 3

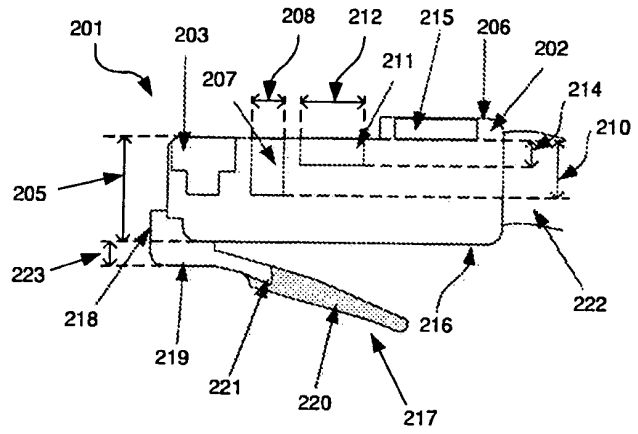


Fig 4

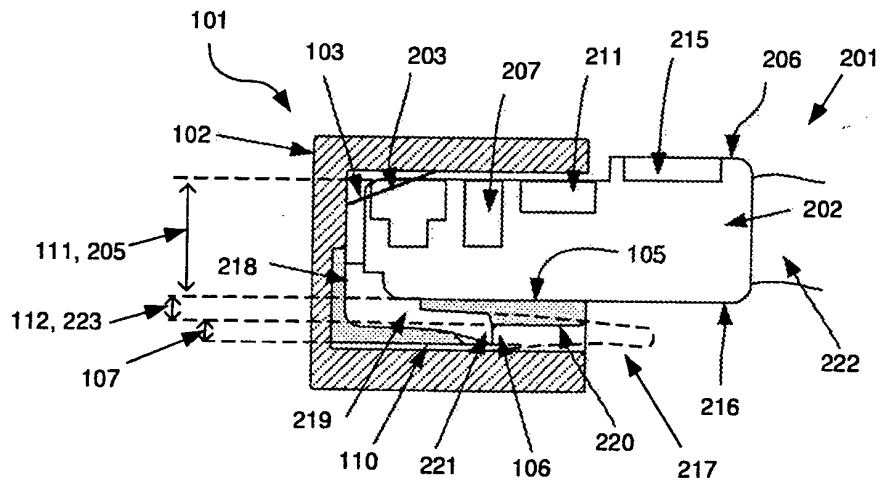


Fig 5

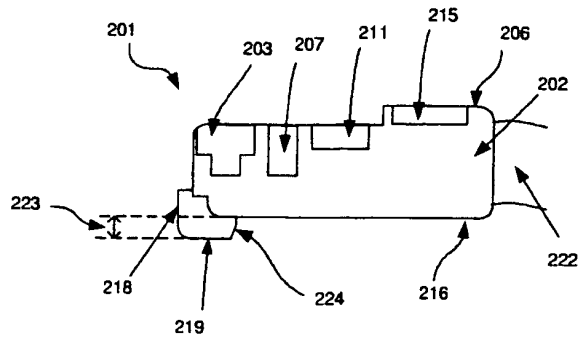


Fig 6

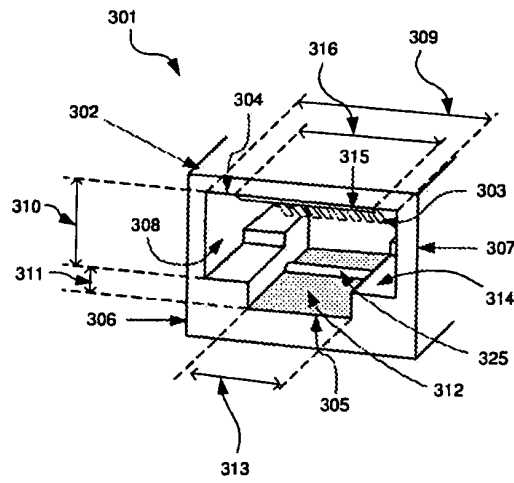


Fig 7

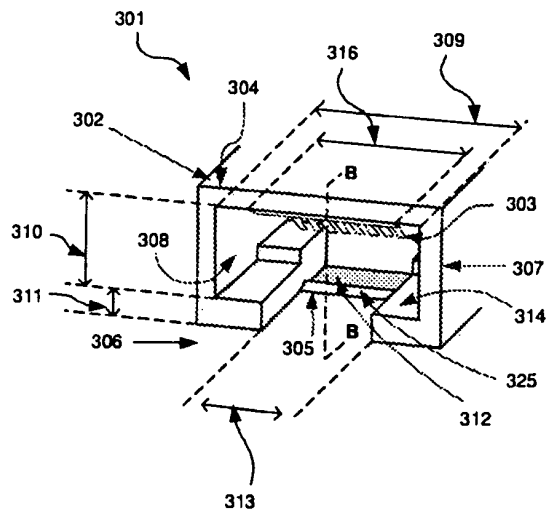


Fig 8

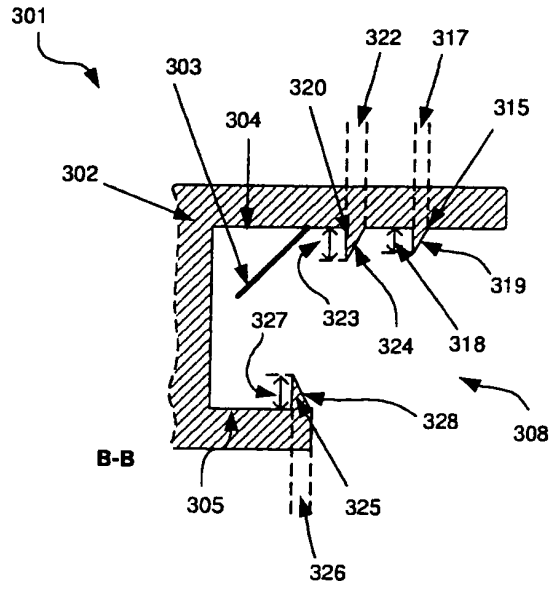


Fig 9

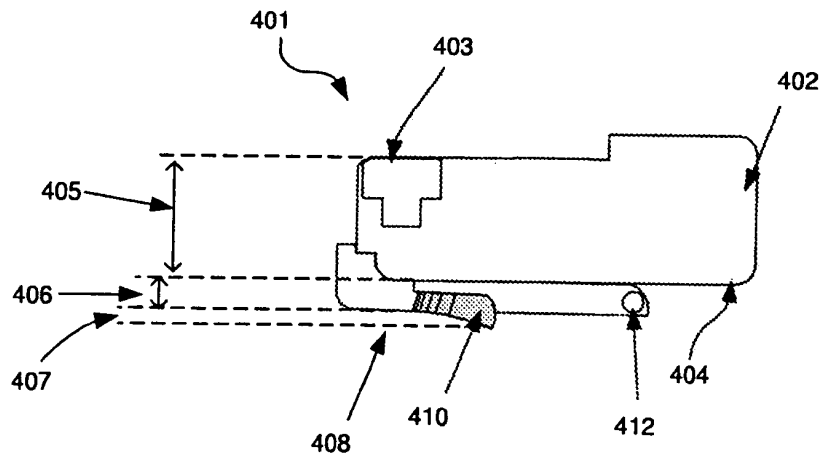


Fig 10

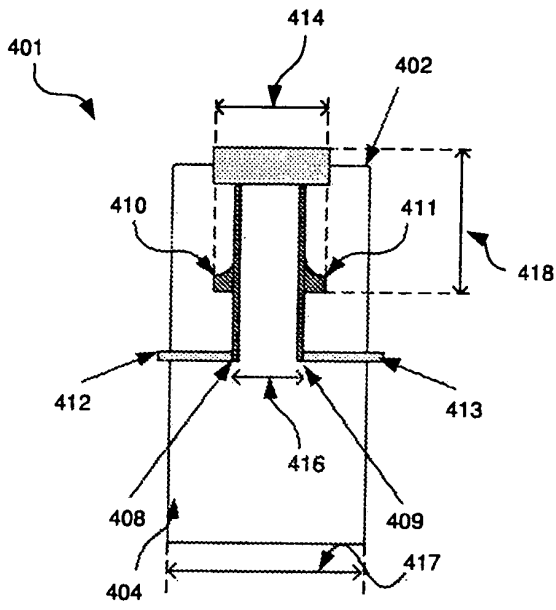


Fig 11a

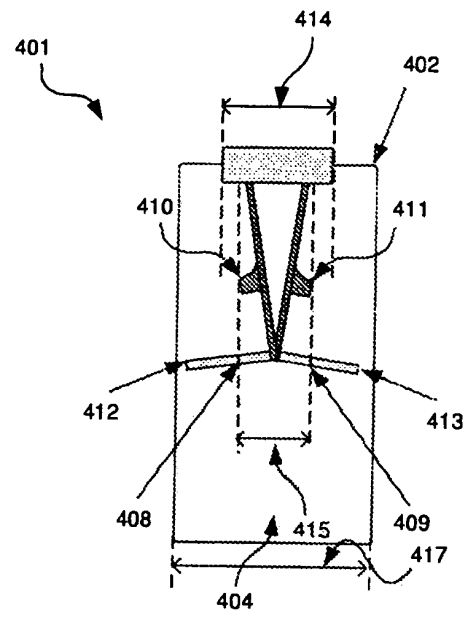


Fig 11b

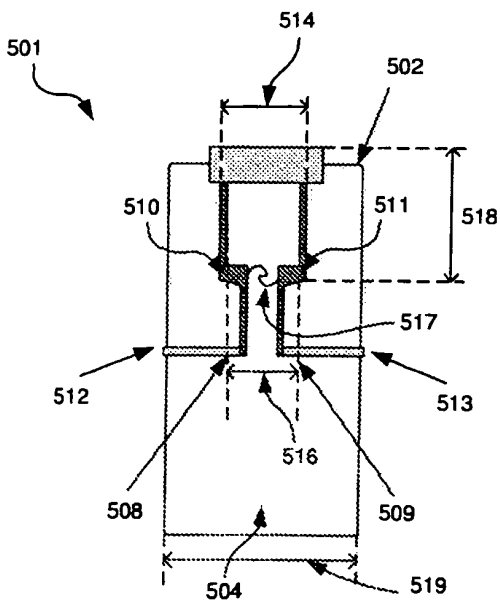


Fig 12a

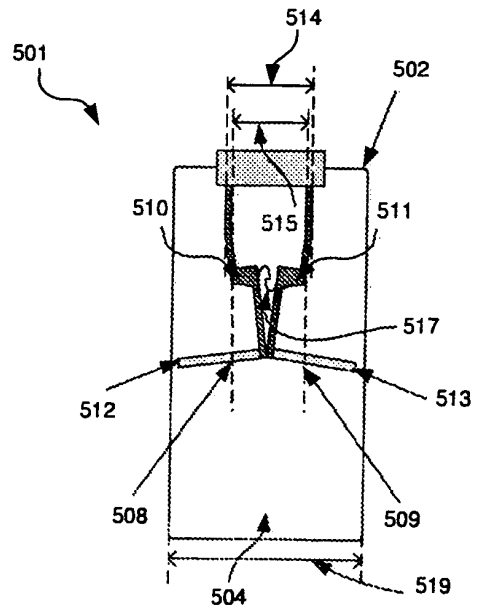


Fig 12b

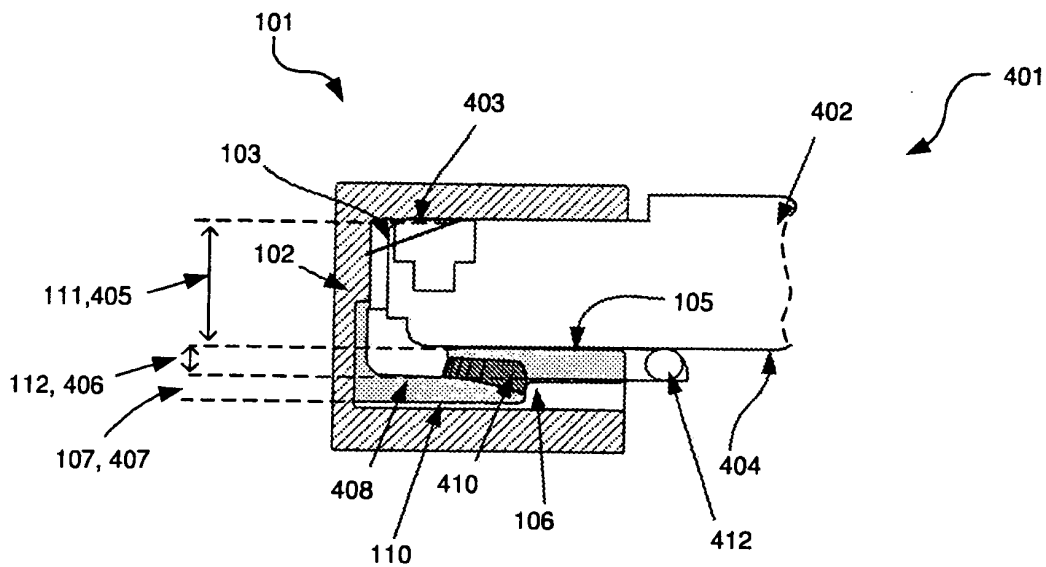


Fig 13

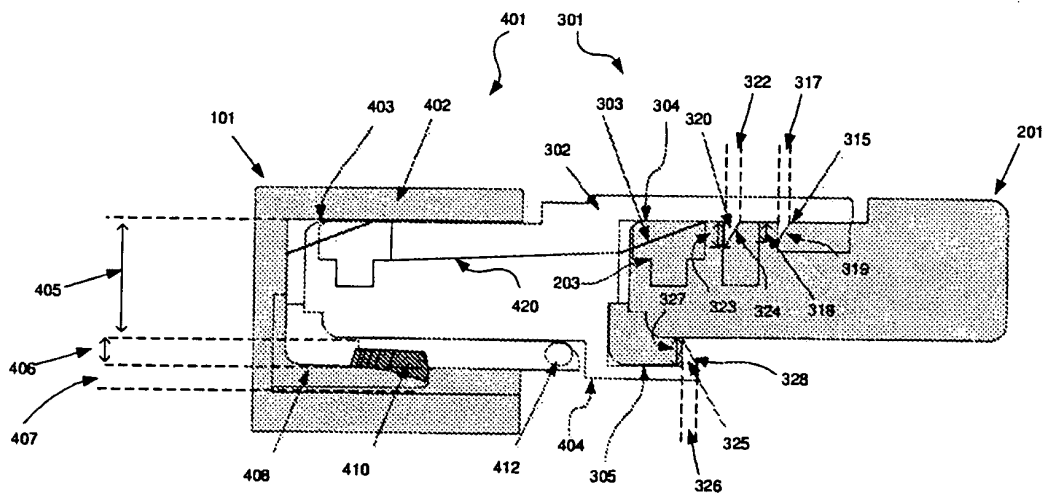


Fig 14



SEARCH REPORT
in accordance with Article 35.1 a)
of the Luxembourg law on patents
dated 20 July 1992

LO 602
LU 91770

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
	LACK OF UNITY OF INVENTION see sheet B -----		INV. H01R33/94
A	US 2010/003858 A1 (MYERS KELLY H [US]) 7 January 2010 (2010-01-07) * paragraph [0020] - paragraph [0029]; figures 1-8 *	1-3	
X	US 2006/046575 A1 (ALLEN GEORGE [US]) 2 March 2006 (2006-03-02) * paragraph [0018] - paragraph [0031]; figures 1-8 *	1-3	
A	US 5 186 649 A (FORTNER LARRY E [US] ET AL) 16 February 1993 (1993-02-16) * figures 1-5 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			H01R
The present search report has been drawn up for all claims			
		Date of completion of the search	Examiner
		17 February 2011	Durand, François
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

LACK OF UNITY OF INVENTION
SHEET B

Application Number

LO 602
LU 91770

The Search Division considers that the present patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3

1. Claims 1-3 disclose an electrical socket for receiving a matching plug wherein the plug comprising at least a notch structure and a structure resulting from a broken off latch flap. the electrical socket comprising a protrusion extending side ways from the middle of said surface with a corresponding structure on said plug.

2. claims: 4-11

2. Claims 4-11 disclose an electrical plug of given type for inserting socket, wherein the socket comprises corner protrusions on the floor of the plug receiving space and the plug comprises a distal and proximal end , at least one outer face where by two arms are extending in the distal-proximal direction along said face, said arms comprising latch means for engaging with said protrusions on said socket , and said arms comprising compression means for releasing engagement between said plug and said socket by changing the distance between said arms

The search has been limited to the first subject.

**ANNEX TO THE SEARCH REPORT
ON LUXEMBOURG PATENT APPLICATION NO.**

LO 602
LU 91770

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-02-2011

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