



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication: **14.12.2011 Bulletin 2011/50** (51) Int Cl.: **H01H 85/20 (2006.01)**

(21) Application number: **11167104.6**

(22) Date of filing: **23.05.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **12.06.2010 CN 201010205224**

(71) Applicant: **SIEMENS AKTIENGESELLSCHAFT**
80333 München (DE)

(72) Inventors:
• **Shen, Hua**
201100 Shanghai (CN)
• **Bao, Zhang Yao**
100076 Beijing (CN)
• **Zhou, Gang**
200030 Shanghai (CN)
• **Cao, Ren Jun**
200030 Shanghai (CN)
• **Su, Fu Jian**
200030 Shanghai (CN)

(54) **Fuse base and fuse using the base**

(57) A fuse base and a fuse using the base comprise a mounting surface with two mounting holes disposed thereon; a first splicing face and a second splicing face perpendicular to the mounting surface, wherein the first splicing face is provided thereon with a first protrusion and a first groove, the second splicing face is provided thereon with a second protrusion and a second groove, the first protrusion is disposed at a position close to one mounting hole in the extension direction of the first splicing face, the second protrusion is also disposed at a position close to one mounting hole in the extension direction of the second splicing face, the first protrusion is

opposite to the second groove in the direction perpendicular to the first splicing face, and the first groove is opposite to the second protrusion in the direction perpendicular to the second splicing face. The fuse bases and the fuses using the bases provided by the present invention can be spliced together into a multi-stage fuse as required when they are used with a melting piece of size 1, and can have an existing isolating plate bracket inserted into the groove on each side of the base and then have an isolating plate mounted onto the isolating plate bracket when they are used for melting pieces of size 2 and size 3.

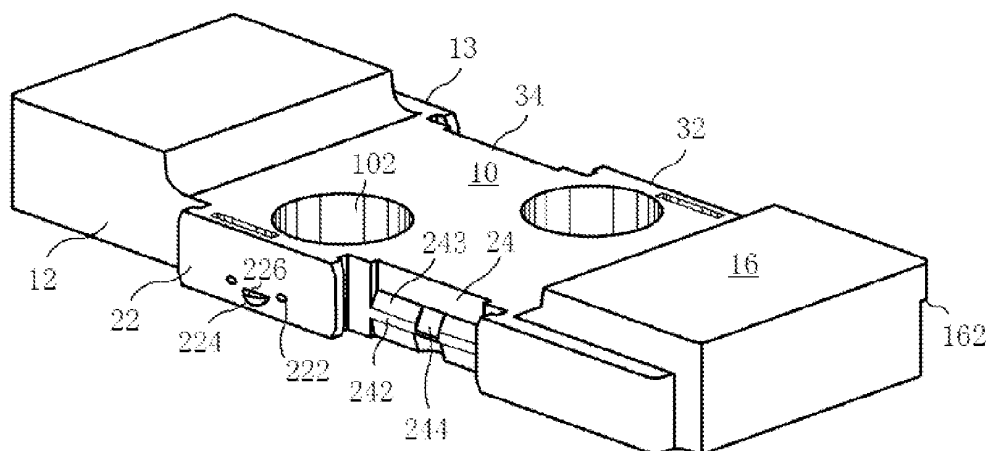


Fig. 5

Description

Technical field

[0001] The present invention relates to a fuse base and a fuse using such a base and, in particular, to a fuse base and a fuse which can have multiple stages spliced together.

Background art

[0002] Fig. 1 shows an illustrative diagram of a currently available single-stage fuse base of size 00. As shown in the figure, a mounting surface 10 of the base is provided thereon with two mounting holes 102, which mounting holes 102 are disposed along a longitudinal central line 104 of the mounting surface. The "longitudinal central line" referred to here does not represent the symmetric center in the geometrical sense, but it is only in terms of the positions of the mounting holes. A protrusion 52 is disposed on a first splicing face 12 perpendicular to the mounting surface 10, and a groove 62 is disposed on a second splicing face 13 perpendicular to the mounting surface 10, with the shape of the protrusion 52 being corresponding to that of the groove 62. According to different design requirements, protrusions and grooves in different bases can be embedded together to splice together a spliced base of more than two stages of size 00. There can be an insertion slot 58 opened on the protrusion 52, so as to facilitate the insertion of an isolating plate (not shown in the figure) into the spliced base.

[0003] However, currently there are only single-stage and three-stage fuse bases of size 1, and the designs of the single-stage and three-stage bases are different and cannot be used together, so it needs to manufacture different bases. The three-stage ceramic bases of size 1 are usually made as a whole piece or assembled with different parts, and not only are they completely different from the single-stage bases in shapes, but also the costs of the three-stage base components are expensive.

[0004] Fig. 2 shows a currently available single-stage fuse base of size 1 which is different from the base of size 00, with two mounting holes 102 thereof being located at the two sides of the longitudinal central line 104 and the edges of the mounting holes being very close to the splicing faces of the base. Currently, although the bases of size 1 can be used together with the bases of sizes 2 and 3, the widths of the melting pieces mounted on the bases are different, and the width of the melting piece of a base of size 2 or 3 is greater than that of a base of size 1. In order to ensure the position of the mounting holes 102, it is necessary to mount additionally an isolating plate bracket 70 on the base of size 1 (as shown by the dotted lines in Fig. 2), then to mount an isolating plate 72 and mount a melting piece of size 2 or 3 on the base of size 1. In this case, the splicing scheme suitable for the bases of size 00 cannot be directly used for the bases of size 1, therefore the bases used for size

2 or 3 have to be redesigned, leading to the increase of design and production costs of the products.

Contents of the invention

[0005] An object of the present invention is to provide a fuse base to realize the splicing together of the fuse bases of size 1, size 2 or size 3, etc., i.e., the single-stage bases of the same size can be spliced together according to different requirements, thus reducing the design and production costs of the multi-stage bases and increasing the flexibility in the use of the bases.

[0006] Another object of the present invention is to provide a fuse base which can ensure the stability after the bases have been spliced together, i.e. they do not tend to move between one another, and at the same time the processing accuracy requirements for the bases can be reduced.

[0007] Another object of the present invention is to provide a fuse base for a fuse which can ensure the accuracy of the base splicing so as to prevent over-stress mounting during the splicing together of bases.

[0008] The present invention further provides a fuse which can realize the splicing together of the fuse bases of size 1, size 2 or size 3, etc., i.e. the single-stage bases of the same size can be spliced together according to different requirements.

[0009] The present invention provides a fuse base comprising a mounting surface and a first splicing face and a second splicing face perpendicular to the mounting surface, in which the mounting surface is provided thereon with two mounting holes located at two sides of a longitudinal central line of the mounting surface. The first splicing face is provided thereon with a first protrusion and a first groove, the second splicing face is provided thereon with a second protrusion and a second groove, the first protrusion is disposed at a position close to one mounting hole in the extension direction of the first splicing face, the second protrusion is also disposed at a position close to one mounting hole in the extension direction of the second splicing face, the first protrusion is opposite to the second groove in the direction perpendicular to the first splicing face, and the first groove is opposite to the second protrusion in the direction perpendicular to the second splicing face.

[0010] In another illustrative embodiment of a fuse base, in which the first protrusion is provided with at least one first pressing lug in the middle of its end face away from the mounting surface, the second protrusion is provided with at least one second pressing lug in the middle of its end face away from the mounting surface, the first groove is provided thereon with a first pressing face mating the second pressing lug, and the second groove is provided thereon with a second pressing face mating the first pressing lug. The first pressing lug and the second pressing lug can be in a spherically crowned shape.

[0011] In another illustrative embodiment of a fuse base, the first groove comprises a first insertion face con-

nected with the first pressing face, and the second groove comprises a second insertion face connected with the second pressing face.

[0012] In another illustrative embodiment of a fuse base, the first groove and the second groove are respectively provided thereon with an insertion groove, the second protrusion and the first protrusion respectively include a first boss and a second boss, with the first boss and the second boss being away from the mounting surface and respectively located underneath the first pressing lug and the second pressing lug and both provided thereon with snap faces for snap-fitting into an insertion groove.

[0013] In another illustrative embodiment of a fuse base, the side faces of the first boss and the second boss perpendicular to the snap faces are spherical or semi-cylindrical faces.

[0014] In yet another illustrative embodiment of a fuse base, the mounting surface is further provided with a protrusion part on one end along the longitudinal central line thereof, the protrusion part is provided with a locating face at the side close to the first protrusion or the second protrusion, and the outer edge of the locating face extends beyond the first splicing face or the second splicing face in which is located the first protrusion or the second protrusion to which the locating face is close, and the locating face and the mounting surface are located in the same plane.

[0015] The present invention further provides a fuse using the abovementioned fuse base.

[0016] The fuse base and the fuse using the base provided by the present invention, with protrusions and grooves being provided respectively on the splicing faces at the two sides of the base, when the width of the melting piece of the single-stage fuse is larger than the width of the base, can have an existing isolating plate bracket inserted into the groove at each side of the base and then have an isolating plate mounted onto the isolating plate bracket. At the same time, when splicing together a plurality of fuse bases of the present invention, the protrusion and groove at one side of a base can be spliced together with the groove and protrusion at the opposite side of another base, so as to splice together a multi-stage fuse as required.

[0017] The fuse base and the fuse using the base of the present invention can be used together in the single-stage fuses of size 1, size 2 and size 3, and at the same time, for the single-stage fuses of size 2 and size 3, they can have isolating plate brackets and isolating plates mounted at the sides of their fuse bases.

[0018] The fuse base and the fuse using the base of the present invention can have the single-stage fuse bases of size 1 spliced together into multiple stages according to application requirements.

[0019] When the fuse base and the fuse using the base of the present invention are used to splice together the single-stage fuse bases of size 1, since the splicing heads are provided with pressing lugs, after their splicing to-

gether, these pressing lugs can be pressed onto the pressing faces in the splicing grooves so as to prevent loosening up between the spliced bases, and at the same time, to reduce the process accuracy requirements to the bases.

[0020] When using the fuse base and the fuse using the base of the present invention, the snap face of the boss of the splicing head can snap-fit into the holding face in the splicing groove, and at the same time, the protruding face of the protruding part on the base can be snap-fitted into the operating face of another base spliced together with it so as to prevent over-stress mounting between the bases when they are spliced together.

15 Brief description of the accompanying drawings

[0021] The following figures are only for illustrative description and explanation of the present invention and are not intended to limit the scope of the present invention.

Fig. 1 is an illustrative diagram of a currently available single-stage fuse base of size 00.

Fig. 2 is an illustrative diagram of a currently available single-stage fuse base of size 1.

Fig. 3 is a perspective illustrative diagram of an illustrative embodiment of a fuse base.

Fig. 4 is an illustrative diagram of splicing together the fuse bases shown in Fig. 3.

Fig. 5 is a perspective illustrative diagram of another illustrative embodiment of the fuse base.

Fig. 6 is an illustrative diagram after two fuse bases shown in Fig. 5 are spliced together.

Fig. 7 is a sectional illustrative diagram along direction VII-VII in Fig. 6.

Fig. 8 is a sectional illustrative diagram along direction VIII-VIII in Fig. 7.

Fig. 9 is a sectional illustrative diagram along direction IX-IX in Fig. 7.

50 **[0022]** Description of reference numerals:

10, 10A, 10B mounting surface
102 mounting holes
104 longitudinal central line
12 first splicing face
13 second splicing face
16 protrusion part
162 locating face
22, 22A first protrusion
222, 222A first pressing lug
224, 224A first boss
226, 226A snap face
24, 24A first groove
242 first pressing face
243, 343B insertion face
244, 344B insertion groove
32, 32B second protrusion

34, 34B second groove
 342B second pressing face
 52 protrusion
 58 slot
 62 groove
 70 isolating plate bracket
 72 isolating plate

Exemplary embodiments

[0023] For the sake of better understanding of the technical features, objects and effects of the present invention, the particular embodiments of the present invention are now described with reference to the accompanying drawings, in which the like numerals represent the parts with the same structures or the same functions. The fuse bases shown in the figures should not be interpreted to represent the practical structures of the fuse bases or the real scales of the practical products, and they are only used to describe the design schemes of the present invention.

[0024] Fig. 3 is a perspective and structural illustrative diagram of an illustrative embodiment of the fuse base of the present invention. As shown in the figure, the fuse base comprises a mounting surface 10 and a first splicing face 12 and a second splicing face 13 perpendicular to the mounting surface. The mounting surface 10 is provided thereon with two mounting holes 102 (only one of them is illustratively shown in the figure) for fixing the base.

[0025] The first splicing face 12 is provided thereon with a first protrusion 22 and a first groove 24, the second splicing face 13 is provided thereon with a second protrusion 32 and a second groove 34, the first protrusion 22 is disposed at a position close to one mounting hole 102, the second protrusion 32 is also disposed at a position close to another mounting hole 102, the first protrusion 22 is opposite to the second groove 34, and the first groove 24 is opposite to the second protrusion 32 in the direction perpendicular to the second splicing face 13. Referring to Fig. 4, a user can splice together the bases indicated respectively by the solid lines and the dotted lines, i.e. the first protrusion 22 of the base indicated by the solid lines is embedded into the second groove of the base indicated by the dotted lines, and the second protrusion of the base indicated by the dotted lines is embedded into the first groove 24 indicated by the solid lines, and an isolating plate can be inserted into the two slots 58 at the same side of the spliced bases (not shown in the figure).

[0026] Those skilled in the art would understand that the relative positions between the two mounting holes 102 are fixed for the fuse bases of size 1, 2, and 3. The first protrusion and the first groove, or the second protrusion and the second groove in the same splicing face, as shown in Fig. 3, can be disposed continuously or separately as required.

[0027] Fig. 5 is an illustrative diagram of another illus-

trative embodiment of the fuse base. As shown in Fig. 5, in an illustrative embodiment of the fuse base, the first protrusion 22 is provided thereon with two first pressing lugs 222 (only one is illustratively shown in the figure), and the second protrusion 32 is provided thereon with two second pressing lugs (not shown in the figure). The first groove 24 is provided thereon with a first pressing face 242 mating the second pressing lugs (not shown in the figure), and the second groove 34 is provided thereon with a second pressing face (not shown in the figure) mating the first pressing lug 222.

[0028] The first groove 24 and/or the second groove 34 are respectively provided thereon with an insertion groove 244, the second protrusion 32 and/or the first protrusion 22 respectively include(s) a boss 224 thereon, said boss 224 is located underneath the first pressing lugs 222 or the second pressing lugs (not shown in the figure), and the boss 224 is provided thereon with a snap face 226 which can be snap-fitted into the insertion groove 244.

[0029] When the two bases are spliced together as shown in Fig. 6, the first protrusion 22A and the first groove 24A of one base are respectively embedded with the second groove 34B and the second protrusion 32B of the other base, in which when the first protrusion 22A and the second groove 34B are embedded together, the correlations between the first pressing lugs and the second pressing face can be seen in Fig. 7.

[0030] Fig. 7 shows the sectional illustrative diagram along line VII-VII in Fig. 6, and as shown in Fig. 7, when two bases are spliced with each other, the first pressing lug 222A of one base just presses against the second pressing face 342B of the other base. Those skilled in the art would understand that the embedding relationships between the second boss and the first groove of the two bases are the same, which will not be described here redundantly.

[0031] Although in the embodiments shown in Figs. 5 to 7, the number of the disposed first pressing lugs 222 and second pressing lugs 322 is two, they can be adjusted to be one or more than two as required. The shapes of the first and second pressing lugs can employ various suitable geometrical shapes, for example, cylinder, square boss or spherical crown, etc. so as to ensure a certain interference fit on the splicing face after two bases have been spliced together, and in the illustrative embodiments in the figures, the first and second pressing lugs are in a spherically crowned shape.

[0032] In addition, in order to ensure the pressing lug in one base be smoothly moved onto the pressing face of the other base, the first groove 24 can include an insertion face 243 connected with the first pressing face 242, as shown in Fig. 5. Likewise, the second groove can also include an insertion face (not shown in the figure) connected with the second pressing face. The insertion face can be disposed at only one side of the pressing face 242, and an insertion face 243 can also be disposed at both sides connected with the pressing face 242, so

as to increase flexibility during the splicing together of the bases, likewise as shown in Fig. 5. As shown in Fig. 7, when two bases are spliced together, the pressing lug 222A of one base can be inserted along the insertion face 343B (only one of them is illustratively shown) of the other base spliced together with it, and after the splicing, the pressing lug 222A can bear against the pressing face 342B.

[0033] Fig. 8 is the sectional illustrative diagram along line VIII-VIII in Fig. 7, and after two bases have been spliced together, the first pressing lug 222A of the first protrusion 22A bears against the second pressing face 342B of the second groove 34B.

[0034] Fig. 9 is the sectional illustrative diagram along line IX-IX in Fig. 7, and after two bases have been spliced together, the first boss 224A of the first protrusion 22A is just embedded in the second insertion groove 344B of the second groove 34B, and the snap face 226A of the first boss 224A is snap-fitted into the second insertion groove 344B. Those skilled in the art would understand that the number of the boss can be adjusted as required. The side face of the boss can be of any suitable shape, for example, semicylinder, semi-sphere, etc. For example, in the illustrative embodiment as shown in Fig. 9, the side face of the boss is a sphere.

[0035] As shown in Fig. 5, in yet another illustrative embodiment of the fuse base, the mounting surface 10 is further provided with a protrusion part 16 on one end along the longitudinal central line thereof (referring to Fig. 2), the protrusion part 16 is provided therein with a locating face 162, the locating face 162 is located at the side close to the second protrusion 32, the edge of the locating face 162 extends beyond the second splicing face 13 close to the second protrusion 32, and the locating face 162 and the mounting surface 10 are located in the same plane. In this way, when two bases are spliced together as shown in Fig. 6, the locating face 162 of one base can bear against the mounting surface of the other base so as to prevent over-stress mounting when splicing together two bases.

[0036] Although in the illustrative embodiment shown in Fig. 5, the protrusion part 16 is disposed at a position close to the second protrusion 32, those skilled in the art would understand that the protrusion part can also be disposed at a position close to the first protrusion, which is similar to Fig. 5 in the structure, and it will not be described here redundantly.

[0037] In the fuse base and the fuse using the base of the present invention, since protrusions and grooves are disposed on both splicing faces of the base, they solve the base splicing problem when they are used for melting pieces of size 1, and at the same time, when they are used for melting pieces of size 2 or size 3, an existing isolating plate bracket can be inserted into the groove on each side face of the base and then an isolating plate can be mounted onto the isolating plate bracket.

[0038] In the fuse base and the fuse using the base of the present invention, the protrusion of each splicing face

is provided thereon with a pressing lug, correspondingly, the groove is provided therein with a pressing face, after the bases have been spliced together, the pressing lug bears against the pressing face so that the bases spliced together will not move relative to each other, and at the same time, the process accuracy requirements for the base is reduced.

[0039] In the fuse base and the fuse using the base of the present invention, the mounting surface is provided thereon with a protrusion part, the protrusion part is provided thereon with a locating face, and after the bases have been spliced together, the locating face can be snap-fitted onto the mounting surface of the other base, which can effectively prevent over-stress mounting during the splicing together of the bases.

[0040] In this specification, the words "first" and "second" are only used to distinguish two parts with the same structure or shape, and they do not indicate the order for their mounting, the importance of the structure, etc.; the word "illustrative" means "acting as an example, an instance or an illustration", and any figure and embodiment described herein as "illustrative" are not to be interpreted as a more preferred or more advantageous technical solution.

[0041] It should be understood that although this description is described according to the embodiments, it is not the case that each embodiment includes only one independent technical solution, such way of explanation in the description is only for the sake of clarity, and those skilled in the art should take the specification as a whole, and the technical solutions in each embodiment can also be combined appropriately to form other implementations which can be understood by those skilled in the art.

[0042] The series of detailed description set forth above is only specific description directed to the viable embodiments of the present invention, and are not intended to limit the protective scope of the present invention, and all the equivalent embodiments or modifications made without departing from the technical spirit of the present invention shall be included in the protective scope of the present invention.

Claims

1. A fuse base, comprising:

a mounting surface (10, 10A, 10B), said mounting surface (10, 10A, 10B) being provided with two mounting holes (102) thereon, and said mounting holes (102) being located at the two sides of a longitudinal central line (104) of the mounting surface (10, 10A, 10B); and
a first splicing face (12) and a second splicing face (13), perpendicular to the mounting surface (10, 10A, 10B),

characterized in that the first splicing face (12) is

provided thereon with a first protrusion (22, 22A) and a first groove (24, 24A), the second splicing face (13) is provided thereon with a second protrusion (32, 32B) and a second groove (34, 34B), the first protrusion (22, 22A) is disposed at a position close to said mounting hole (102) in the extension direction of the first splicing face (12), the second protrusion (32, 32B) is also disposed at a position close to said mounting hole (102) in the extension direction of the second splicing face (13), the first protrusion (22, 22A) is opposite to the second groove (34, 34B) in the direction perpendicular to the first splicing face (12), and the first groove (24, 24A) is opposite to the second protrusion (32, 32B) in the direction perpendicular to the second splicing face (13).

2. The fuse base as claimed in claim 1, wherein, the first protrusion (22, 22A) is provided with at least one first pressing lug (222, 222A) in the middle of its end face away from said mounting surface (10, 10A, 10B), the second protrusion (32, 32B) is provided with at least one second pressing lug in the middle of its end face away from said mounting surface (10, 10A, 10B), the first groove (24, 24A) is provided thereon with a first pressing face mating the second pressing lug, and the second groove (34, 34B) is provided thereon with a second pressing face mating the first pressing lug (222, 222A) .
3. The fuse base as claimed in claim 2, wherein the first pressing lug (222, 222A) and the second pressing lug are in a spherically crowned shape.
4. The fuse base as claimed in claim 2, wherein the first groove (24, 24A) comprises a first insertion face connected with the first pressing face (242), and the second groove (34, 34B) comprises a second insertion face connected with the second pressing face (342B).
5. The fuse base as claimed in claim 2, wherein the first groove (24, 24A) and/or the second groove (34, 34B) are/is respectively provided thereon with an insertion groove (244, 344B), the second protrusion (32, 32B) and/or the first protrusion (22, 22A) respectively include(s) a boss, said boss is located underneath the first pressing lug (222, 222A) or the second pressing lug and it is provided thereon with a snap face (226, 226A), with said snap face (226, 226A) being capable of snap-fitting into said insertion groove (244, 344B) .
6. The fuse base as claimed in claim 5, wherein the side face of said boss perpendicular to said snap face (226, 226A) is a spherical face.

7. The fuse base as claimed in claim 5, wherein the side face of said boss perpendicular to said snap face (226, 226A) is a semi-cylindrical face.
8. The fuse base as claimed in claim 1, wherein said mounting surface (10, 10A, 10B) is further provided with a protrusion part (16) on one end along the longitudinal central line (104) thereof, said protrusion part (16) is provided with a locating face (162) at the side close to the first protrusion (22, 22A) or the second protrusion (32, 32B), the outer edge of the locating face extends beyond the first splicing face (12) or the second splicing face (13) in which is located the first protrusion (22, 22A) or the second protrusion (32, 32B) to which the locating face (162) is close, and said locating face (162) and said mounting surface (10, 10A, 10B) are located in the same plane.
9. A fuse employing a fuse base as claimed in any one of claims 1 to 8.

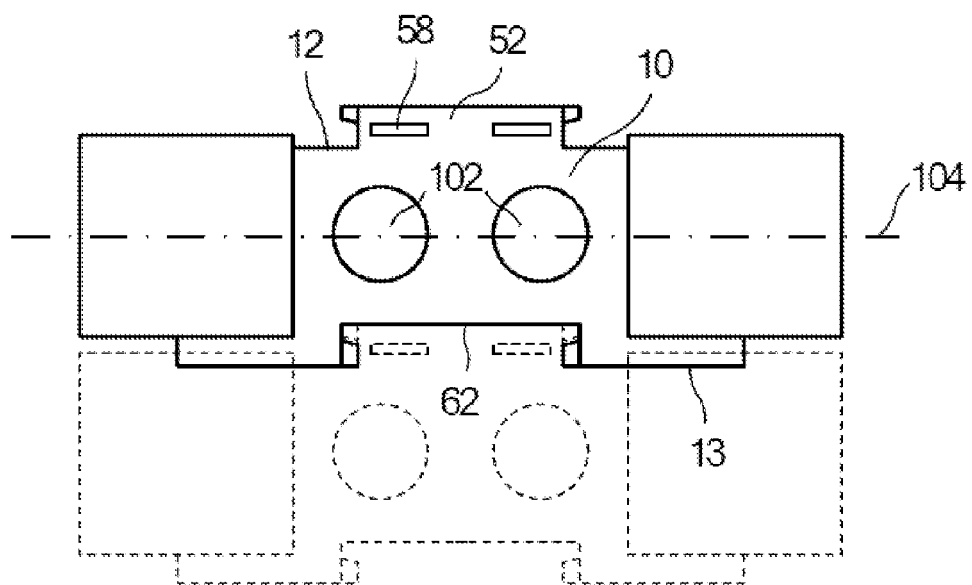


Fig. 1

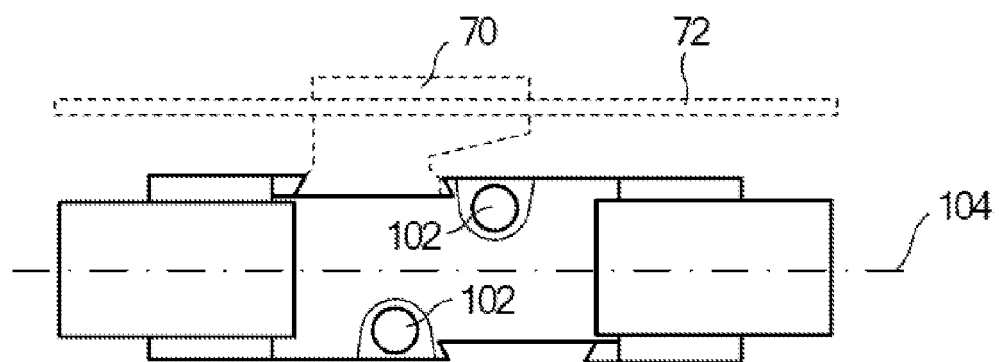


Fig. 2

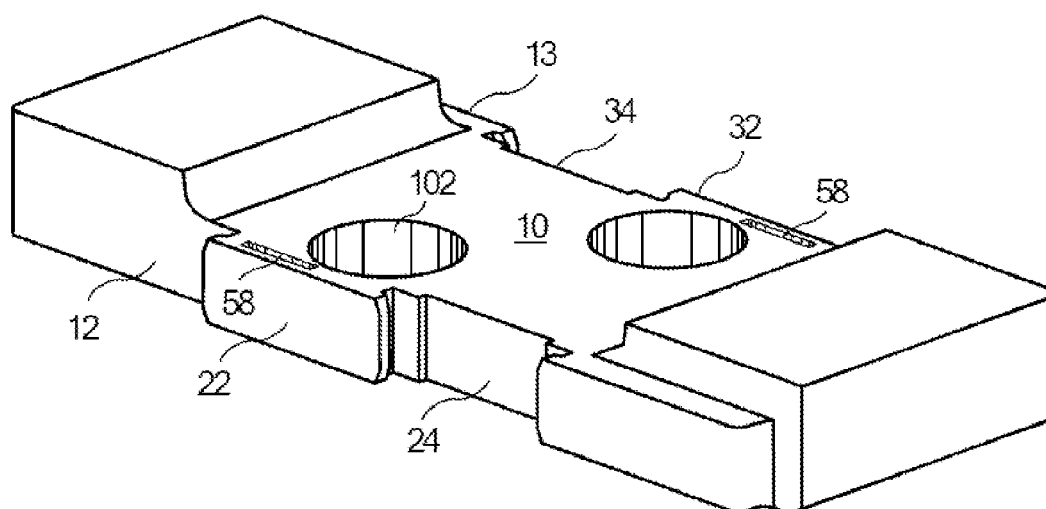


Fig. 3

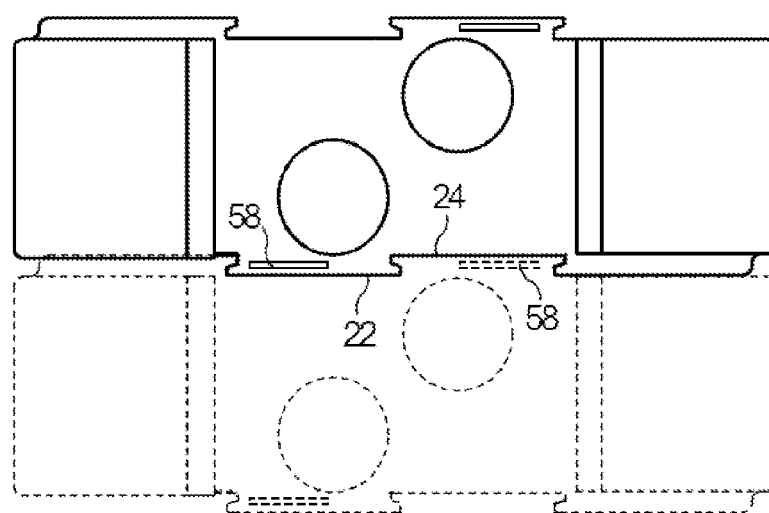


Fig. 4

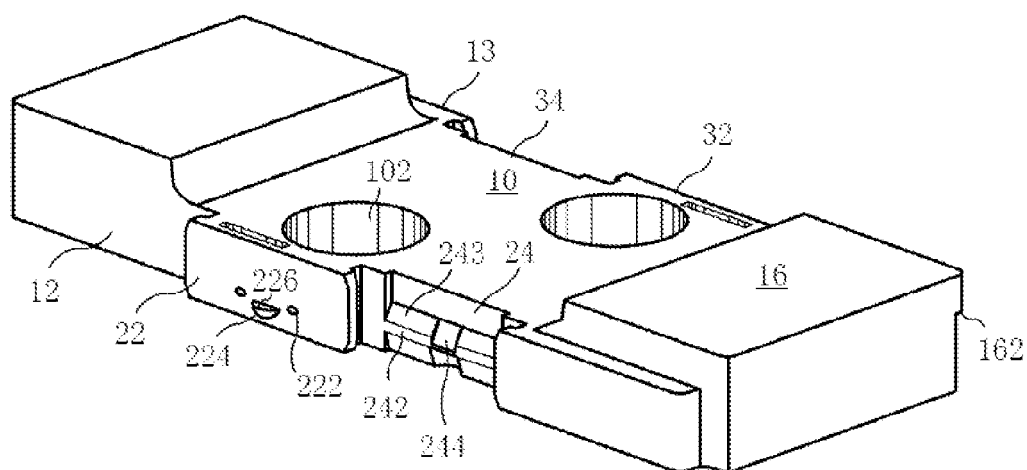


Fig. 5

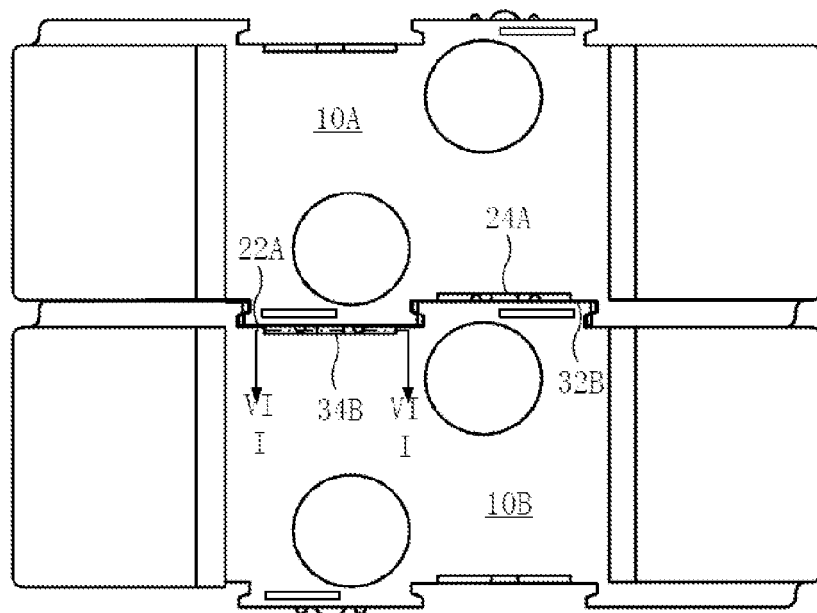


Fig. 6

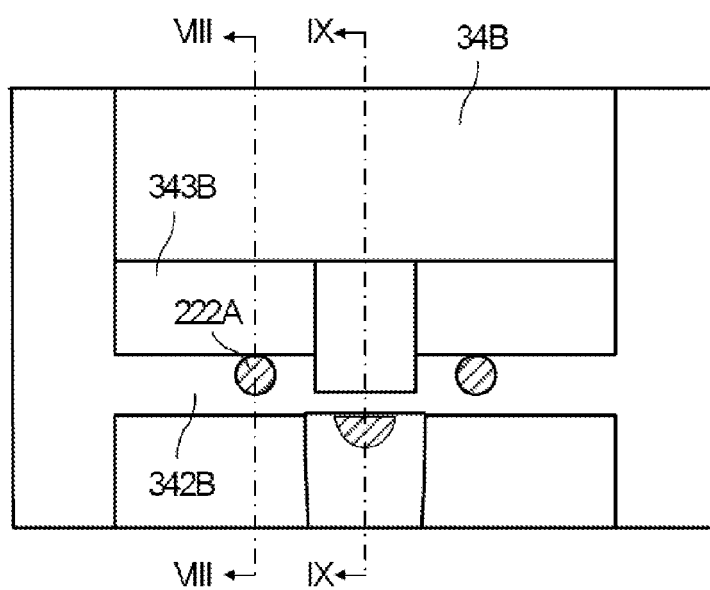


Fig. 7

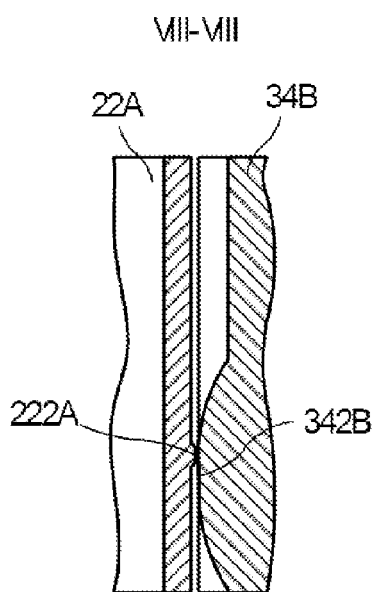


Fig. 8

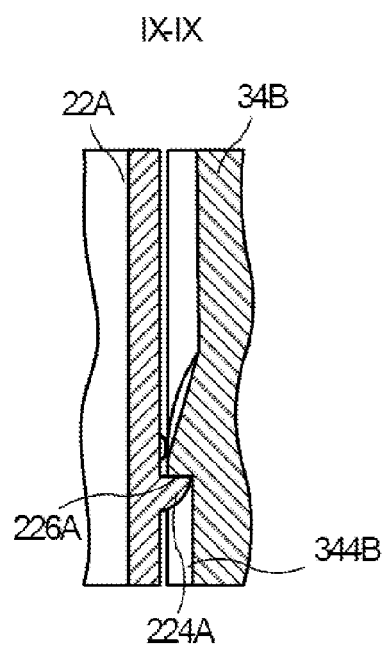


Fig. 9



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 7104

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 90 06 878 U1 (SIEMENS AG) 23 August 1990 (1990-08-23)	1,8,9	INV. H01H85/20
Y	* page 3, line 6 - page 4, line 20; figures 1,2 *	2-7	

X	DE 73 02 131 U (LINDNER GMBH) 3 May 1973 (1973-05-03)	1,9	
Y	* page 5, paragraph 3 - page 7, paragraph 1; figures 1-4 *	2-7 8	

X	DE 29 49 548 A1 (HERMSDORF KERAMIK VEB [DD]) 11 June 1981 (1981-06-11)	1,9	TECHNICAL FIELDS SEARCHED (IPC) H01H
Y	* page 3, line 1 - page 4, line 19; figures 1,2 *	2-7 8	

Y	US 6 157 287 A (DOUGLASS ROBERT STEPHEN [US] ET AL) 5 December 2000 (2000-12-05)	2,3,6,7	
A	* column 2, line 66 - column 4, line 53; figures 1-6 *	1,4,5,8, 9	

Y	DE 73 33 339 U (ELEKTROTECHNISCHE FABRIK O. FREES KG) 20 December 1973 (1973-12-20)	4,5	
A	* page 8, paragraph 1 - page 9, paragraph 2; figures 2,4 *	1-3,6-9	

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 28 October 2011	Examiner Pavlov, Valeri
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

1
EPO FORM 1503 03.82 (P04C01)

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

EP 11 16 7104

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.

28-10-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 9006878	U1	23-08-1990	NONE	
DE 7302131	U	03-05-1973	NONE	
DE 2949548	A1	11-06-1981	NONE	
US 6157287	A	05-12-2000	NONE	
DE 7333339	U	20-12-1973	NONE	