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(54) **Lock detection connector**

Verbinder mit Verriegelungserkennung

Connecteur à détection de verrouillage

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EP 0 657 968 B1

Description

The present invention relates to a lock detecting connector which can detect that a pair of connectors engageable with each other are in a completely locked state.

Recently, automobiles carry air bags. Safety devices such as these air bags must be highly reliable, which thus demands that incomplete connection of male and female connectors be avoided with certainty. To meet such demand, connectors whose complete connection is detected electrically have been developed to date.

Fig. 1 shows a conventionally known lock detecting structure of this type. A groove-like engagement portion la is formed on the upper surface of a connector 1 on the male side that is firmly fixed on a board 2. On the other hand, a flexible lock piece having a projection 7a is integrally formed on the upper surface of a connector 5 on the female side to be engaged with the connector 1 on the male side, the projection 7a being held by the engagement portion la when both connectors 1, 5 are connected.

In addition, within the connector 1 on the male side, a pair of lock detecting electrodes 4a, 4b is disposed while positioned on both sides of an inverted T-shaped position determining piece 3 as shown in Fig. 2. On the other hand, within the connector 5 on the female side, a U-shaped short circuit electrode 6 is arranged so as to interpose the position determining piece 3 between the leg portions thereof as shown in Fig. 2.

In the thus designed lock detecting structure, as the connector 5 on the female side is being inserted into the connector 1 on the male side while elastically deforming a flexible lock piece 7 thereof, the short circuit electrode 6 is elastically deformed upward by a guide projection 3b formed on a partition wall 3a of the position determining piece 3 as shown in Fig. 3, so that the short circuit electrode 6 keeps distance from the detecting electrodes 4a, 4b at the initial stage of the insertion. Then, when the connector 5 on the female side has been inserted into a regular position of the connector 1 on the male side, the projection 7a of the flexible lock piece 7 is held by the engagement portion la to thereby unremovably lock both connectors 1, 5. At the same time, the short circuit electrode 6 comes out of the projection 3b to come in contact with the lock detecting electrodes 4a, 4b as shown in Fig. 4. The lock detecting electrodes 4a, 4b are connected to a not shown detecting circuit, so that it is judged that both connectors 1, 5 have been connected in the locked state by way of short-circuiting the lock detecting electrodes 4a, 4b.

In the aforementioned conventional lock detecting structure, the short circuit electrode 6 is disposed within the connector 5 on the female side. This structure is advantageous in preventing the detecting electrodes 4a, 4b from being shortcircuited while insulated by foreign matter such as dirt and dust upon contact between the detecting electrodes 4a, 4b and the short circuit electrode 6, since foreign matter is hard to deposit on the short circuit electrode 6. However, this structure does not allow the user to check the condition of the short circuit electrode 6 visibly; i.e., the short circuit electrode 6 is left concealed, and this is undesirable in terms of quality control.

To overcome this problem, the short circuit electrode may be disposed on the outer surface of the connector, and a cover may be provided to cover the entire part of the connector having the short circuit electrode as long as the connector having the short circuit electrode is not connected to the mating connector. The cover may be removed to expose the short circuit electrode when the short circuit electrode must be inspected visibly or when the connector having the short circuit electrode is connected to the mating connector. However, this design is still disadvantageous in involving an extra step of removing the cover prior to connecting both connectors, which leads to a reduction in the efficiency of the entire connecting operation.

An example of the connector using the above lock detection structure is shown in Figs. 5 and 6. Fig. 5 shows a connector housing 40 on the male side. A plurality of male terminals 41 is accommodated within the housing 40, and these terminals 41 project outward through the wall surface in the back of the housing 40. In addition, from the wall surface in the back projects a rib 42, which extends in parallel with the terminals 41 within the housing 40. A partition wall 43 standing upright in the middle of the rib 42 divides the upper surface of the rib 42 into right and left parts. Lock detecting terminals 44 are disposed on such right and left parts of the rib 42. Both lock detecting terminals 44 project outward through the wall surface in the back of the housing 40 like other terminals. On the other hand, a connector housing 45 on the female side accommodates a not particularly shown short circuit terminal. The short circuit terminal has such a shape as to come in contact with the lock detecting terminals 44 simultaneously upon engagement (complete engagement) of the connector housings 40, 45. Therefore, when both connector housings 40, 45 have been engaged with each other completely, both lock detecting terminals 44 are ready to conduct through the short circuit terminal. As a result, the complete engagement can be detected electrically.

However, the aforementioned structure in which the lock detecting terminals are disposed in the middle of the connector housing 40 addresses a problem shown in Fig. 7. The problem is that the edge portion of the connector housing 45 on the female side is caught on the distal end of the rib 43 or on the distal ends of the lock detecting terminals 44 when both housings 40, 45 are being engaged misaligned. This causes the rib and the like to be deformed, which may in turn make engagement of the connector housings or lock detection of the connector housings impossible depending on the degree of deformation.

US-A-5,131,865 discloses a connector apparatus

having a lock detecting function for a reliable electric connection between the coupling detecting electrical contact elements. From this known connector the present invention starts from. The connector apparatus includes a resilient locking arm and a cooperable engaging element provided on first and second housings, respectively. A pair of coupling detecting contact elements are disposed in a movement-permitting spacing of the first housing for the locking arm and each has a contact portion which is displaced in response to displacement of the locking arm. A short-circuiting contact element is secured to the engaging element. When the two housings are coupled completely to each other, the coupling detecting contact elements are allowed to contact with the short-circuiting element to establish an electrical connection between them. When the two housings are not coupled completely to each other, the engaging element displaces the locking arm to disengage the coupling detecting contact elements from the short-circuiting contact elements to interrupt an electrical connection between the coupling detecting contact element.

However, also in this known lock detecting structure, the short-circuiting elements are disposed within one connector housing and thus this structure does not allow the user to readily check the condition of the short circuiting elements visibly, and this is undesirable in terms of quality control.

The present invention has been made in consideration of the aforementioned circumstances and its object resides in providing a connector whose short circuiting terminal is protected from deposit of dirt, dust or other foreign matter on the one hand, but on the other hand can be readily visibly inspected, if desired.

A solution of this object is achieved by the features as definend in claim 1.

Accordingly, the present invention provides a lock detecting connector comprising: two connector housings for engagement with each other, wherein at least a pair of lock detecting terminals being provided in one of the connector housings; and a short circuit terminal in the other of the connector housings, the short circuit terminal serving to detect a locked state of both connector housings by way of short-circuiting the pair of lock detecting terminals when both connector housings are engaged with each other completely. According to the present invention the lock detecting connector is furthermore characterized in that said other connector housing has the short circuit terminal exposed to the outside and has a cover movable between a protecting position and an opening position, the protecting position being such a position as to allow the cover to cover a contact portion of the short circuit terminal, the opening position being such a position as to allow the cover to expose said contact portion of the short circuit terminal, and the cover is pushingly moved from the protecting position to the opening position by said one connector housing when both connector housings are being connected.

With both connectors not connected to each other, the cover disposed on one of the connector housings is set to the protecting position at which the short circuit terminal or electrode is covered. Foreign matter such as dirt and dust is hard to deposit on the short circuit electrode under this condition. When the cover is moved from the protecting position to the opening position, whether foreign matter is deposited on the short circuit electrode can be visibly checked.

In addition, the operation of connecting both connector housings is carried out when the cover on the one connector housing is set to the protecting position. As both connector housings are being connected to each other, the cover is moved from the protecting position to the opening position while pushed by the other connector housing, so that the short circuit electrode is ready to come in contact with the detecting electrodes. When both connector housings have been correctly connected and locked so as not to be removable, the detecting electrodes come in contact with the uncovered short circuit electrode, which allows the locked state of both connector housings to be detected.

As described in the mode of operation, the present device is characterized as allowing the user to visibly check the condition of the short circuit electrode, which facilitates quality control. The present device is also characterized as dispensing with the extra step of removing the cover prior to the operation of connecting both connectors, which contributes to improved efficiency in the connecting operation.

The following is a detailed description of the present invention, which is to be seen in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view of the appearance of a conventional lock detecting structure;

Fig. 2 is a perspective view of a short circuit electrode and lock detecting electrodes;

Fig. 3 is a side view showing connection between the short circuit electrode and the lock detecting electrodes;

Fig. 4 is a side view showing connection between the short circuit electrode and the lock detecting electrodes;

Fig. 5 is a front view of a conventional housing on the male side;

Fig. 6 is a side sectional view of Fig. 5;

Fig. 7 is a sectional view showing a conventional problem;

Fig. 8 is a perspective view of the appearance of a connector according to an embodiment of the invention on the female side with a cover removed therefrom;

Fig. 9 is a perspective view of the appearance of the connector on the female side with the cover attached thereto;

Fig. 10 is a sectional view of a connector on the male side and the connector on the female side dis-

connected from each other;

Fig. 11 is a sectional view of the connector on the male side and the connector on the female side connected to each other;

Fig. 12 is a partially cutaway plan view of the connector on the female side with the cover removed therefrom;

Fig. 13 is a partially cutaway plan view of the connector on the female side with the cover set to a protecting position;

Fig. 14 is a partially cutaway plan view of the connector on the female side with the cover set to a detecting position;

Fig. 15 is a partially enlarged sectional view of the connector on the male side and the connector on the female side when connection of both connectors is started;

Fig. 16 is a partially enlarged sectional view of the connector on the male side and the connector on the female side when the connection of both connectors is being effected; and

Fig. 17 is a partially enlarged sectional view of the connector on the male side and the connector on the female side when the connection of both connectors has been completed.

An embodiment of the present invention will now be described hereinafter with reference to the drawings.

Fig. 8 shows a connector 310 on the female side having cavities 311 into which not shown female terminal fittings are inserted. The connector 310 on the female side is made of synthetic resin. An axially extending flexible lock piece 312 is formed integrally on the upper surface of the connector 310 so as to be elastically deformable vertically. This flexible lock piece 312 is formed by coupling a pair of slenderly extending arm portions 313 to a block portion 314. Guide projections 315 for guiding a cover 320 are formed on the outer surfaces of both arm portions 313. The cover 320 will be described later.

In addition, a short circuit electrode 316 is interposed between both arm portions 313 so as to be elastically deformable integrally with the arm portions. The short circuit electrode 316 is made of a metallic plate. An engagement hole 317 is formed at a position that is rather rearward with respect to the middle of the short circuit electrode 316 in the axial direction. On the upper surface of the short circuit electrode 316 is a pair of contacts 316a. These contacts 316a are positioned on both sides of the engagement hole 317.

Moreover, the cover 320 for protecting these contacts 316a of the short circuit electrode 316 is attached to the flexible lock piece 312. The cover 320 is composed of a protective plate portion 321 and a pair of slide portions 322. The protective plate portion 321 spans the arm portions 313 of the flexible lock piece 312 and the short circuit electrode 316, and the slide portions 322 are formed at both ends of the protective plate portion 321 and extend in parallel with the arm portions 313. The cover 320 not only allows guide grooves 323 formed on the inner surfaces of the slide portions 322 to be fitted with the guide projections 315 by causing the slide portions 322 to move along the outer surfaces of the arm portions 313, but also allows the rear ends of the slide portions 322 to be fitted with guide recesses 318 formed on the sides of the block portion 314, so that the cover 320 can move relative to the connector 310 on the female side in the axial direction. When the cover 320 is set to a protecting position that is at the front end of the movable range thereof, the protective plate portion 321 covers the contacts 316a from above, whereas when the cover 320 is set to an opening position that is at the rear end of the movable range thereof, the protective plate portion 321 exposes the contacts 316a while displaced rearward from the contacts 316a.

On the other hand, located on the left side in Fig. 10 is a connector 330 on the male side made of synthetic resin. The connector 330 on the male side has male terminal fittings 332 that project toward a hood portion 331 in the front and confront the cavities 311 of the connector 310 on the female side. A pair of L-shaped detecting electrodes 333 connected to a not shown detecting circuit is attached to the connector 330 on the male side so as to extend along and project from the upper inner wall of a hood portion 331 of the connector 330. Both detecting electrodes 333 are such that distal ends 333a thereof projecting toward the hood portion 331 are inwardly bent, and such inwardly bent portions 333a are coupled to each other by an insulating engagement portion 335 that projects downward from the bent portions 333a. With the connector 310 on the female side being correctly inserted into the hood portion 331 of the connector 330 on the male side, not only the distal ends 333a of the detecting electrodes 333 come in contact with the contacts 316a of the short circuit 316 from above, but also the engagement portion 335 is fitted into the engagement hole 317 of the short circuit electrode 316 from above.

Next, a mode of operation of this embodiment will be described.

With the connector 310 on the female side not connected to the connector 330 on the male side, the cover 320 of the connector 310 on the female side is set to the protecting position at which the contacts 316a of the short circuit electrode 316 are covered thereby as shown in Fig. 13. Accordingly, foreign matter such as dirt and dust is hard to deposit on the contacts 316a of the short circuit electrode 316. To visibly check if foreign matter has been deposited on the contacts 316a of the short circuit electrode 316, the cover 320 is slid rearward to the opening position to thereby expose the contacts 316a as shown in Fig. 14. As a result, the conditions of the contacts 316a can be inspected visibly. Upon completion of the visible inspection, the cover 320 is moved back frontward to the protecting position as shown in Fig. 13. Thus, the contacts 316a of the short circuit elec-

trode 316 can be protected and inspected easily as well as reliably, which in turn facilitates quality control.

In addition, to connect the connector 310 on the female side to the connector 330 on the male side, the connector 130 on the female side is inserted into the hood portion 331 of the connector 330 on the male side. As a result, as shown in Fig. 15, at the initial stage of the insertion, the engagement portion 335 at the distal ends of the detecting electrodes 333 comes in contact with the upper surface of the short circuit electrode 316 to thereby elastically deform the short circuit electrode 316 together with the flexible lock piece 312 downward, so that the detecting electrodes 333 are kept distant from the short circuit electrode 316.

As the connector 310 is further inserted into the connector 330, as shown in Fig. 16, the front end of the engagement portion 335 comes in contact with the front end of the protective plate portion 321. As the connector 310 is still further inserted into the connector 330, the engagement portion 335 pushes the cover 320 so that the cover 320 moves rearward with the detecting electrodes 333 not being in contact with the short circuit electrode 316.

Upon complete connection of the both connectors 310, 330, the cover 320 pushed by the engagement portion 335 moves to the opening position, which moves the engagement portion 335 to such a position as to be engageable with the engagement hole 317 of the short circuit electrode 316 and thereby releases the pushing of the engagement portion 335 toward the flexible lock piece 312 and the short circuit electrode 316. Accordingly, the flexible lock piece 312 and the short circuit electrode 316 return upward by the restitutive force, and as shown in Fig. 17, not only the engagement portion 335 gets engaged with the engagement hole 317, but also the distal ends 333a of the detecting electrodes 333 come in contact with the contacts 316a of the short circuit electrode 316.

Since the rear end of the engagement portion 335 becomes engageable with the front end of the engagement hole 317 upon engagement of the engagement portion 335 with the engagement hole 317, both connectors 310, 330 are locked so as not to be movable in such a direction as to be released from each other. When the short circuit electrode 316 comes in contact with the detecting electrodes 333, both detecting electrodes 333 are short-circuited, which causes the detecting circuit to detect the short-circuiting and hence the correct locking of both connectors 310, 330.

During this connecting operation, the cover 320 set to the protecting position is pushed by the engagement portion 335 to move to such a position as to expose the contacts 316a of the short circuit electrode 316. Therefore, no extra step of removing the cover 320 from the connector 310 on the female side before starting the connecting operation is required. Hence, efficiency in the entire connecting operation is improved.

In addition, unless both connectors 310, 330 are locked with the engagement portion 335 engaged with the engagement hole 317, the detecting electrodes 333 never come in contact with the short circuit electrode 316. Therefore, there is no danger of mistaking a false locking of the connectors with the detecting electrodes 333 coming in false contact with the short circuit electrode 316 for a correct locking.

It should be noted that the present device is not limited to the aforementioned embodiment and, therefore, that various modifications may be made without departing from the scope of the appended claims.

Claims

1. A lock detecting connector comprising:

   two connector housings (310, 330) for engagement with each other, wherein at least a pair of lock detecting terminals (333) being provided in one (330) of the connector housings; and
   a short circuit terminal (316) in the other (310) of the connector housings, the short circuit terminal (316) serving to detect a locked state of both connector housings (310, 330) by way of short-circuiting the pair of lock detecting terminals (333) when both connector housings are engaged with each other completely,

   characterized in that

   said other connector housing (310) has the short circuit terminal (316) exposed to the outside and has a cover (320) movable between a protecting position and an opening position, the protecting position being such a position as to allow the cover (320) to cover a contact portion (316a) of the short circuit terminal (316), the opening position being such a position as to allow the cover (320) to expose said contact portion (316a) of the short circuit terminal (316), and

   the cover (320) is pushingly moved from the protecting position to the opening position by said one connector housing (330) when both connector housings (310, 330) are being connected.

2. The lock detecting connector of claim 1, wherein the lock detecting terminals (333) are arranged along an inner wall surface of the one connector housing (330) accommodating the lock detecting terminals, and distal ends (333a) of the lock detecting terminals (333) are positioned backward with respect to an engagement opening of the one connector housing (330).

3. The lock detecting connector as claimed in claim 1 or 2, wherein a flexible lock piece (312) is formed on said one connector housing (330) and an engagement portion (335) is formed on the other (310) of the connector housings, respectively; and wherein said short circuit terminal (316) is electrically connected to said lock detecting terminals (333) when said flexible lock piece (312) is engaged with said engagement portion (335).

4. The lock detecting connector of anyone of claims 1 to 3, wherein said short circuit terminal (316) includes a leaf spring.

5. The lock detecting connector of claim 3 or 4, wherein upon connection of said two connector housings (310, 330) said engagement portion (335) pushes said cover (320) from the protecting position to the opening position, wherein said short circuit terminal is elastically deformed by said engagement portion (335) such that said lock detecting terminals (333) are out of electrical contact with said short circuit terminal (316) unless said engagement portion (335) engages an engagement hole (317) in said one (310) connector housing when both connector housings (310, 330) are completely connected and said short circuit terminal (316) is elastically restored, so that electrical contact between said short circuit terminal (316) and said lock detecting terminals (333) takes place.

6. The lock detecting connector of claim 5, wherein said engagement hole (317) is arranged in said short circuit terminal (316).

Patentansprüche

1. Verbinder mit Verriegelungserkennung enthaltend:

   zwei Verbindergehäuse (310, 330) zum gegenseitigen Eingriff, wobei zumindest ein Paar von Verriegelungserkennungsanschlüssen (333) in einem der Verbindergehäuse (330) vorgesehen ist; und
   einen Kurzschlußanschluß (316) im anderen Verbindergehäuse (310), wobei der Kurzschlußanschluß (316) zum Erfassen eines Verriegelungszustands von beiden Verbindergehäusen (310, 330) durch ein Kurzschließen der beiden Verriegelungserkennungsanschlüsse (333) dient, wenn beide Verbindergehäuse vollständig miteinander im Eingriff sind,

   dadurch gekennzeichnet, daß

   das andere Verbindergehäuse (310) den Kurzschlußanschluß (316) freiliegend auf der Aussenseite aufweist und eine Abdeckung (320) enthält, die zwischen einer geschützten Lage und einer offenen Lage bewegbar ist, wobei die geschützte Lage eine derartige Lage ist, die es der Abdeckung (320) erlaubt, einen Kontaktabschnitt (316a) des Kurzschlußanschlusses (316) abzudecken, wobei die offene Lage eine derartige Lage ist, die es der Abdeckung (320) erlaubt, den Kontaktabschnitt (316a) des Kurzschlußanschlusses (316) freizulegen, und
   wobei die Abdeckung (320) durch das eine Verbindergehäuse (330) schiebend von der geschützten Lage zur offenen Lage bewegt wird, wenn beide Verbindergehäuse (310, 330) verbunden werden.

2. Verbinder mit Verriegelungserkennung nach Anspruch 1, wobei die Verriegelungserkennungsanschlüsse (333) längs einer inneren Wandfläche des einen Verbindergehäuses (330) angeordnet sind, welches die Verriegelungserkennungsanschlüsse beherbergt, und wobei distale Enden (333a) der Verriegelungserkennungsanschlüsse (333) hinter einer Eingriffsöffnung von dem einen Verbindergehäuse (330) positioniert sind.

3. Verbinder mit Verriegelungserkennung nach Anspruch 1 oder 2, wobei auf dem einen Verbindergehäuse (330) ein flexibles Verriegelungsstück (312) und auf dem anderen Verbindergehäuse (310) ein Eingriffsabschnitt (335) ausgebildet ist; und wobei der Kurzschlußanschluß (316) elektrisch mit den Verriegelungserkennungsanschlüssen (333) verbunden ist, wenn das flexible Verriegelungsstück (312) mit dem Eingriffsabschnitt (335) in Eingriff ist.

4. Verbinder mit Verriegelungserkennung riach einem der Ansprüche 1 bis 3, wobei der Kurzschlußanschluß (316) eine Blattfeder enthält.

5. Verbinder mit Verriegelungserkennung nach Anspruch 3 oder 4, wobei der Eingriffsabschnitt (335) die Abdeckung (320) beim Verbinden der beiden Verbindergehäuse (310, 330) von der geschützten Lage in die offene Lage schiebt, wobei der Kurzschlußanschluß durch den Eingriffsabschnitt (335) derart elastisch verformt wird, daß die Verriegelungserkennungsanschlüsse (333) außer elektrischen Kontakt mit dem Kurzschlußanschluß (316) sind, bis der Eingriffsabschnitt (335) in ein Eingriffsloch (317) in dem einen Verbindergehäuse (310) eingreift, wenn beide Verbindergehäuse (310, 330) vollständig verbunden sind und der Kurzschlußanschluß (316) elastisch zurückgestellt ist, so daß ein elektrischer Kontakt zwischen dem Kurzschlußanschluß (316) und den Verriegelungserkennungsanschlüssen (333) auftritt.

6. Verbinder mit Verriegelungserkennung nach Anspruch 5, wobei das Eingriffsloch (317) im Kurzschlußanschluß (316) angeordnet ist.

Revendications

1. Un connecteur à détection de verrouillage comprenant:

   deux boîtiers de connecteur (310, 330) pour s'engager l'un avec l'autre, dans lequel au moins une paire de terminaux à détection de verrouillage (333) étant prévue dans l'un (330) des boîtiers de connecteur; et
   un terminal de court circuit (316) dans l'autre (310) des boîtiers de connecteur, le terminal de court circuit (316) servant pour détecter un état verrouillé des deux boîtiers de connecteur (310, 330) en court-circuitant la paire de terminaux à détection de verrouillage (333) quand les deux boîtiers de connecteur sont complètement engagés l'un avec l'autre,

   caractérisé en ce que

   ledit autre boîtier de connecteur (310) a le terminal de court circuit (316) exposé vers l'extérieur et a une couverture mobile entre une position de protection et une position d'ouverture, la position de protection étant une position telle à permettre à la couverture (320) de couvrir une portion de contact (316a) du terminal de court circuit (316), la position d'ouverture étant une position telle à permettre à la couverture (320) d'exposer ladite portion de contact (316a) du terminal de court circuit (316), et
   la couverture (320) et déplacée par des pousses de la position de protection à la position d'ouverture par ledit l'un boîtier de connecteur (330) quand les deux boîtiers de connecteur (310, 330) sont connectés.

2. Le connecteur à détection de verrouillage selon la revendication 1, dans lequel les terminaux à détection de verrouillage (333) sont disposés le long d'une surface d'une paroi intérieure de l'un boîtier de ccnnecteur (330) logeant les terminaux à détection de verrouillage, et des extrémités distales (333a) des terminaux à détection de verrouillage (333) sont positionnées en arrière par rapport à une ouverture d'engagement de l'un boîtier de connecteur (330).

3. Le connecteur à détection de verrouillage tel que revendiqué dans la revendication 1 ou 2, dans lequel une pièce flexible de verrouillage (312) est formée sur ledit un boîtier de connecteur (330) et une portion d'engagement (335) est formée sur l'autre (310) des boîtiers de connecteur, respectivement; et dans lequel ledit terminal de court-circuit (316) est électriquement connecté audits terminaux à détection de verrouillage (333) quand ladite pièce flexible de verrouillage (312) est engagée avec ladite portion d'engagement (335).

4. Le connecteur à détection de verrouillage selon l'une quelconque des revendications 1 à 3, dans lequel ledit terminal de court-circuit (316) comprend un ressort à lames.

5. Le connecteur à détection de verrouillage selon la revendication 3 ou 4, dans lequel, en cas de connexion desdits deux boîtiers de connecteur (310, 330), ladite portion d'engagement (335) pousses ladite couverture (320) de la position de protection à la position d'ouverture, dans lequel ledit terminal de court circuit est élastiquement déformé par ladite portion d'engagement (335) de manière que lesdits terminaux à détection de verrouillage (333) ne sont plus en contact électrique avec ledit terminal de court circuit (316) à moins que ladite portion d'engagement (335) s'engage avec un trou d'engagement (317) dans ledit un boîtier de connecteur (310) quand les deux boîtiers de connecteur (310, 330) sont complètement connectés et ledit terminal de court circuit (316) est élastiquement reconstitué de manière qu'il y a un contact électrique entre ledit terminal de court circuit (316) et lesdits terminaux à détection de verrouillage (333).

6. Le connecteur à détection de verrouillage selon la revendication 5, dans lequel ledit trou d'engagement (317) est disposé dans ledit terminal de court circuit (316).

FIG. 1

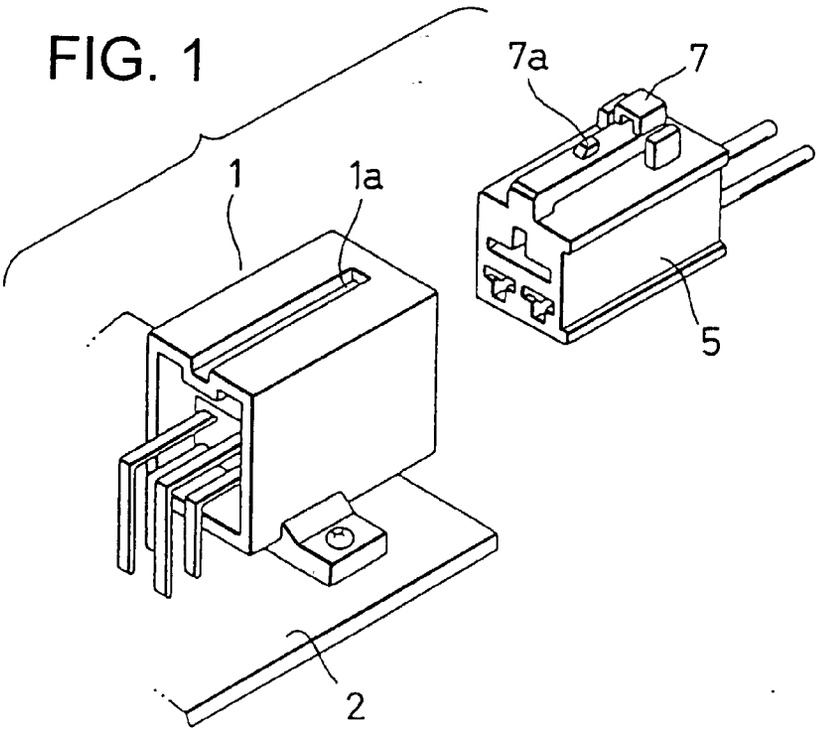

FIG. 2

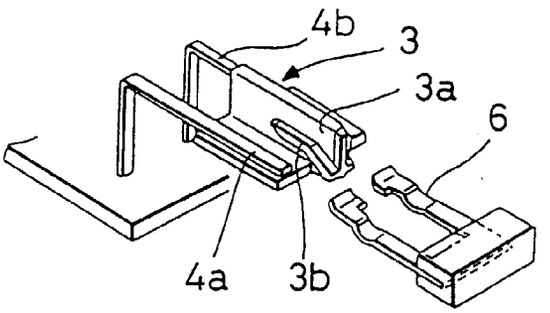

FIG. 3

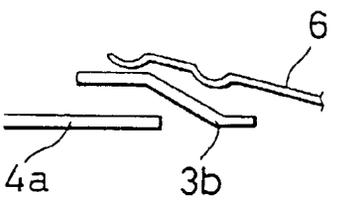

FIG. 4

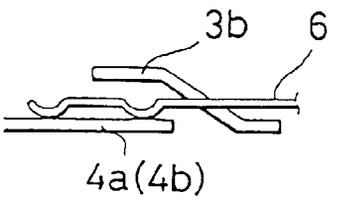

FIG. 5

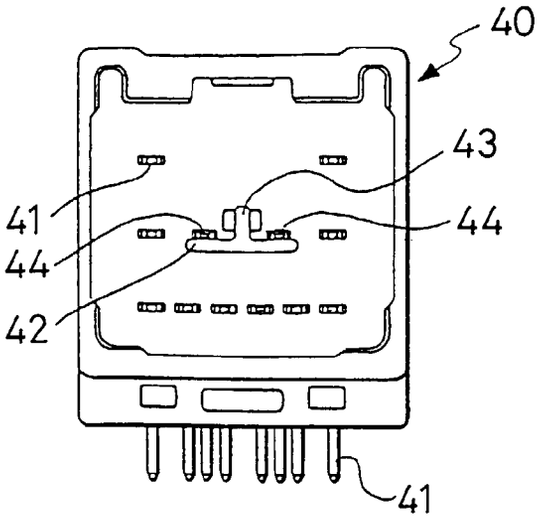

FIG. 6

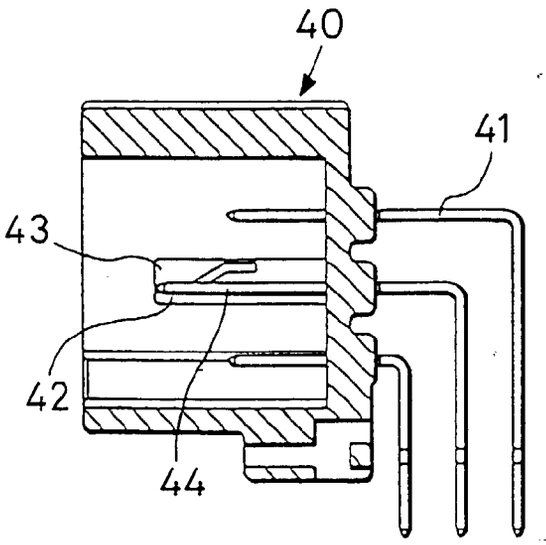

FIG. 7

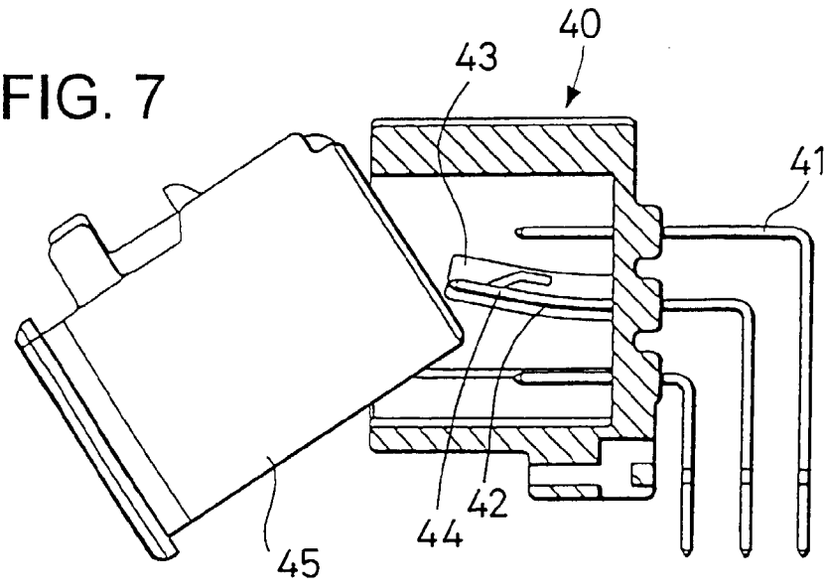

FIG. 8

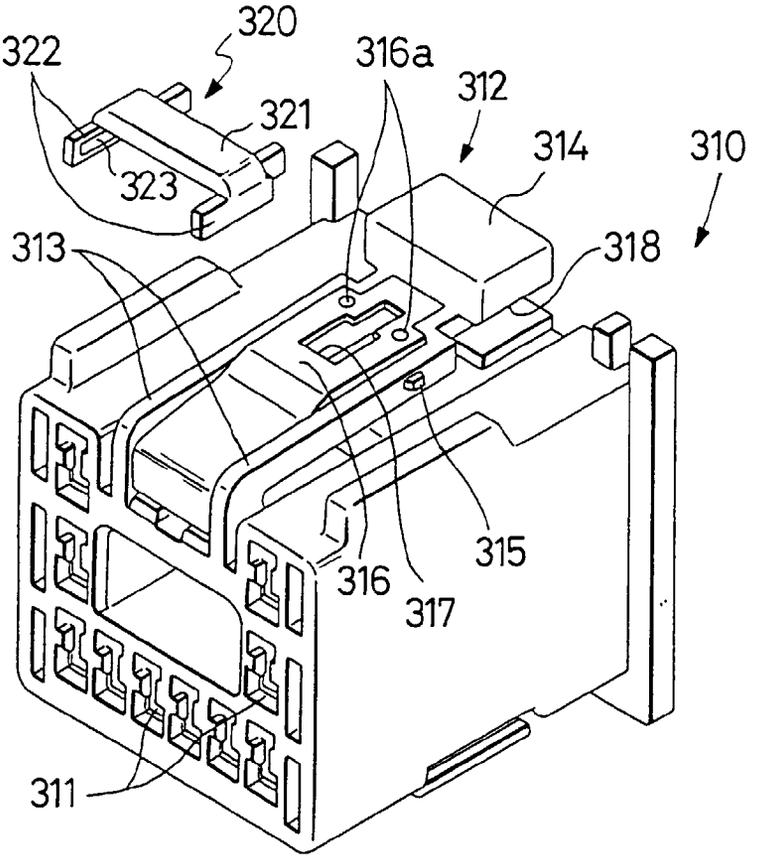
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FIG. 9

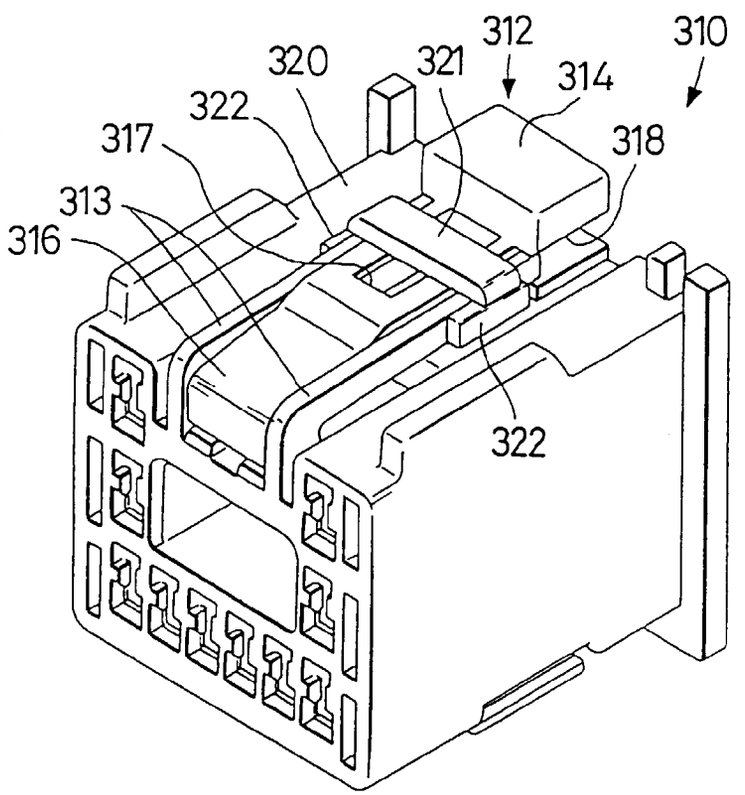
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FIG. 10

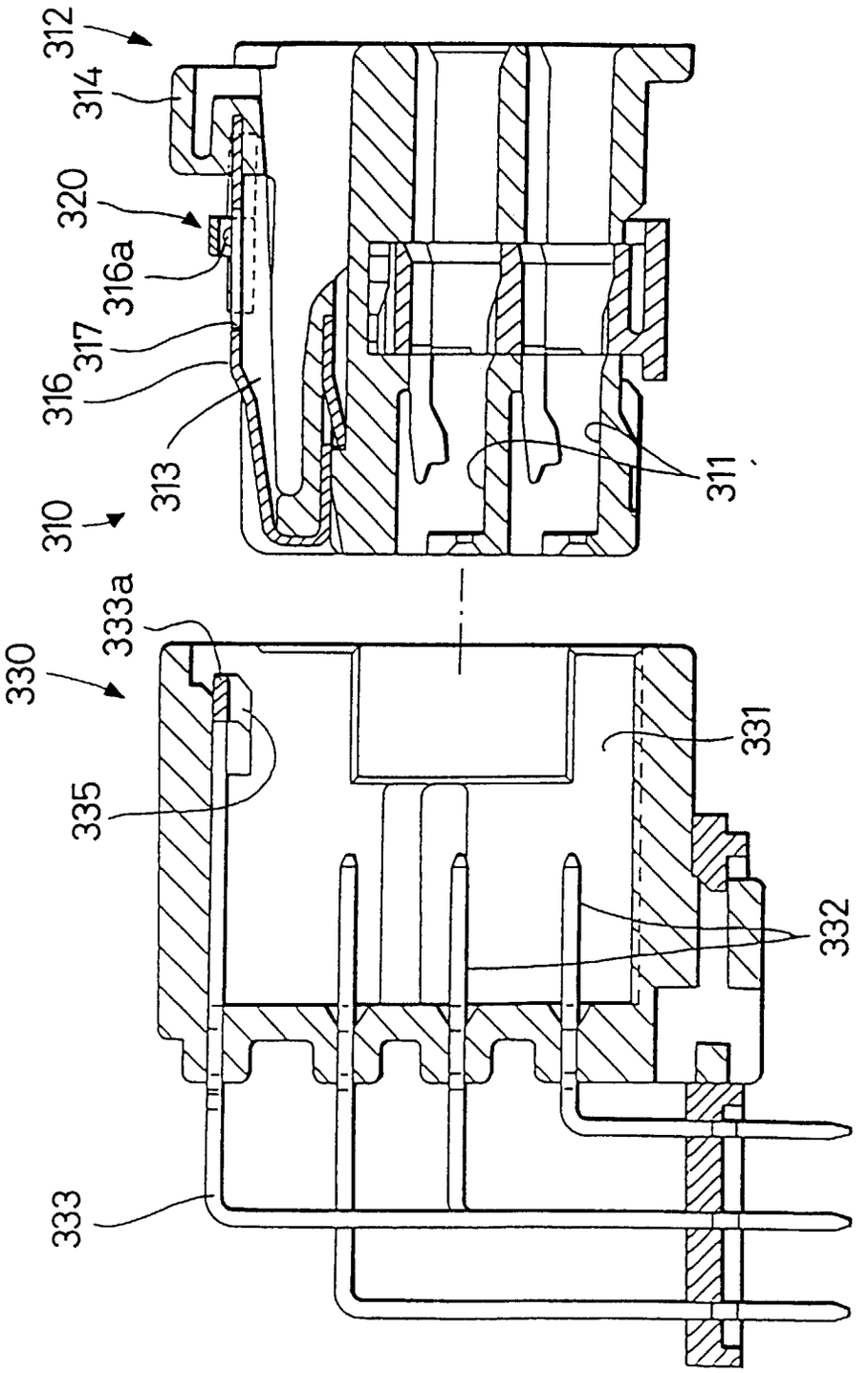

FIG. 11

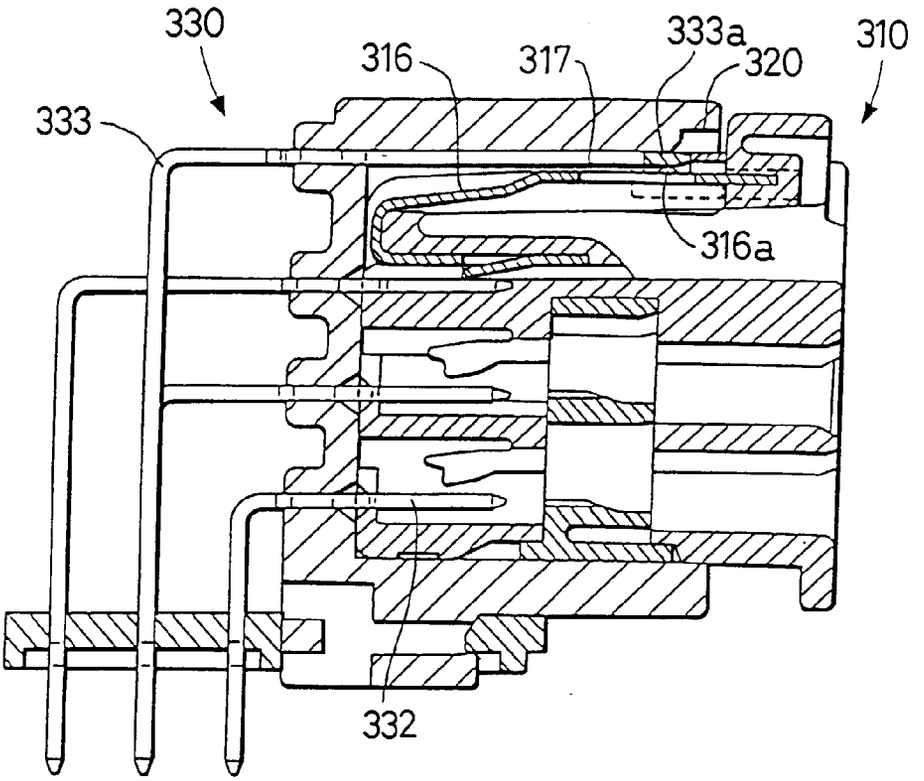
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FIG. 12

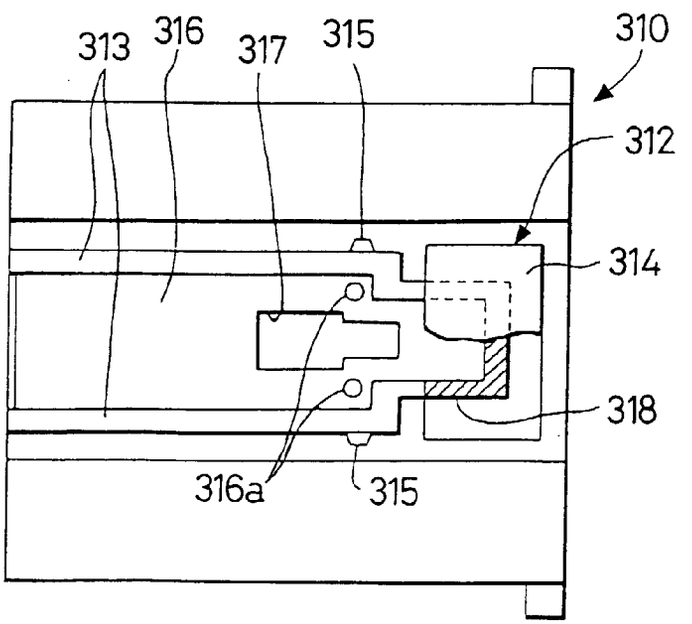
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FIG. 13

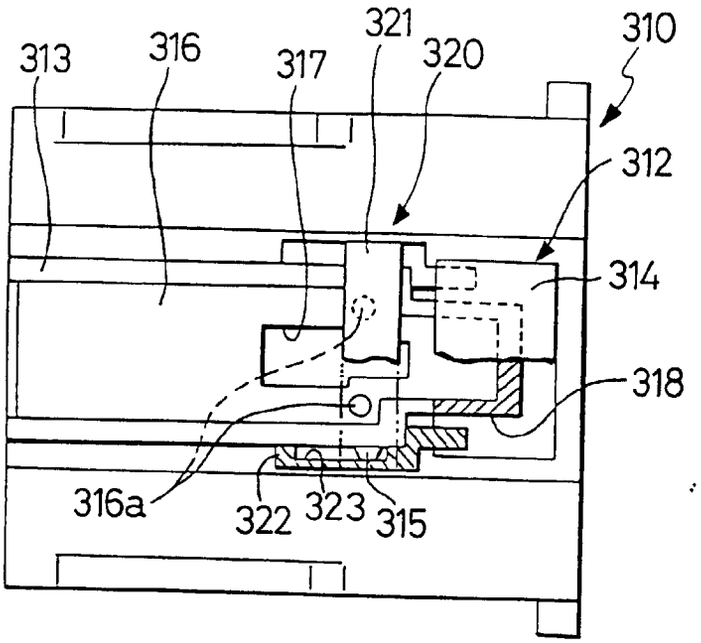
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FIG. 14

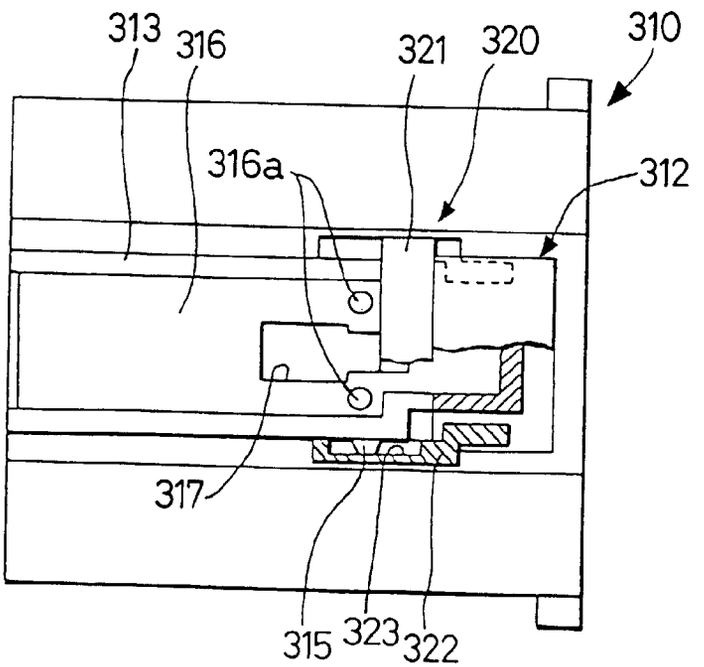
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FIG. 15

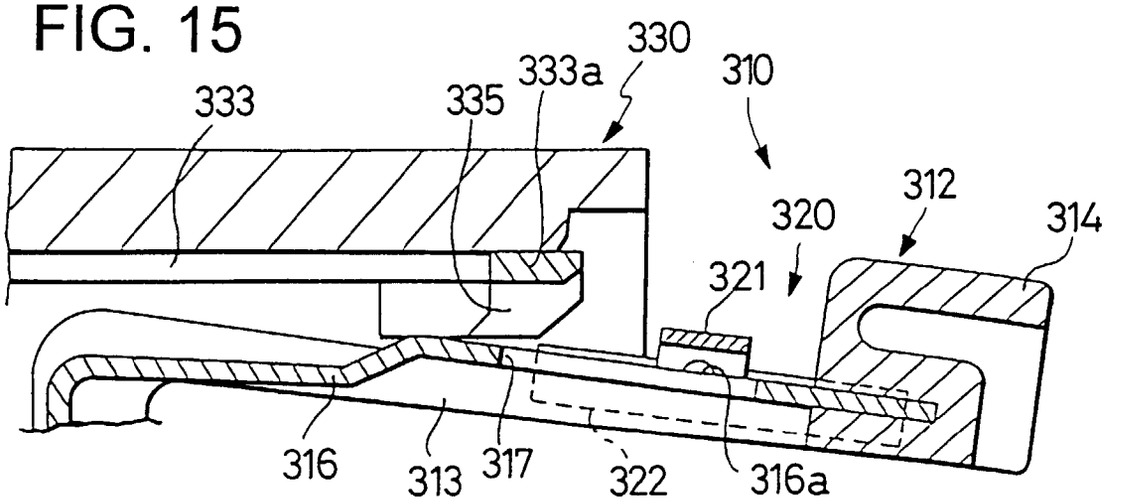

FIG. 16

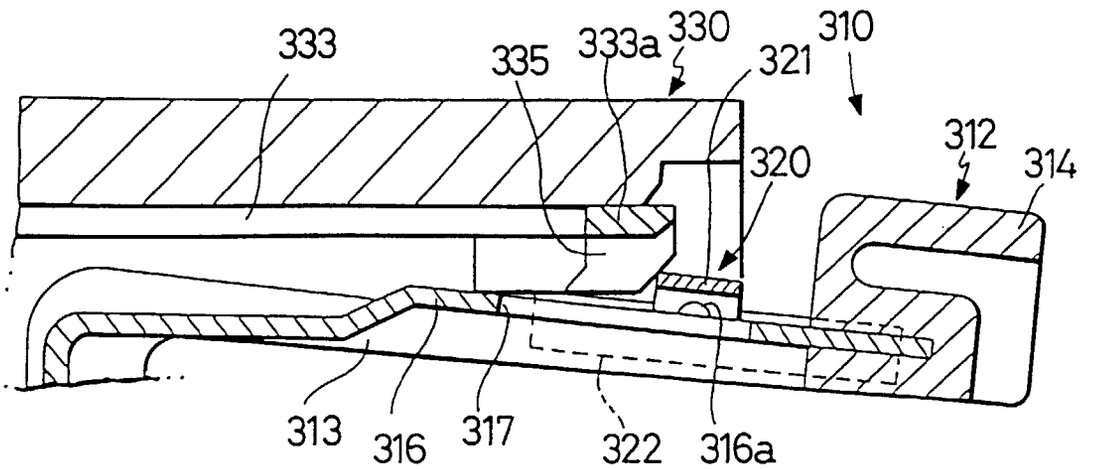

FIG. 17