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(54) **Unlocking aid**

Enriegelungsmechanismus
Mécanisme de déverrouillage

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Description

[0001] The invention relates to an electrical connector with an unlocking aid for unlocking contacts which are attached to a line and retained in a housing by a primary latch mechanism.

[0002] Primary latch mechanisms are typically constructed on the contacts in the form of outwardly protruding latching springs which reach behind an edge in the housing of the plug. Such primary latch mechanisms can typically only be released using sharp objects which bend the latching springs downwards, insofar as they are accessible from the outside at all. In so doing, however, the latching springs are usually plastically deformed so that either they subsequently have to be bent back again or the contacts cannot be re-used.

[0003] US 4,635,355 discloses a method and apparatus for extracting an electrical terminal having a cantilevered locking lance from a first housing, and preparing the locking lance of the terminal for insertion in the same or a second similar housing. The connector housing includes an outer wall having a window formed therein for receiving a free end of the locking lance. The lance free end engages an edge of the window when the terminal is fully inserted in the connector housing, thereby preventing withdrawal of the terminal from the housing. A tool is provided with first and second lance engaging portions, the first lance engaging portion including a projection of predetermined dimensions receivable in the window to depress and deform the locking lance, allowing extraction of the terminal from the connector housing. Deformation of the lance is limited to a repairable amount. The second lance engaging portion of the tool includes a hook-like lance reforming member insertable beneath the lance and a floor of the terminal. The hook-like member includes an external rocking surface for engaging the terminal floor. Upon rocking of the hook-like member, the lance is wedged away from the floor so that the deformation thereof is removed, and its original operating performance restored.

[0004] If a plurality of contacts are connected to a line and retained in a housing using primary latching mechanisms, then in order to separate the housing from the line or to separate the contacts from the housing all of the primary latching mechanisms have to be unlocked at the same time. Using a single object, this is only possible if the primary latching mechanisms are destroyed or the latching springs are plastically deformed.

[0005] A special tool for unlocking the contacts is therefore necessary, this special tool making it possible to release all the primary latching mechanisms at the same time. Since there are a plurality of housings and the contacts are not always arranged at the same spacing from one another, there is no universal tool which can be used to unlock the contacts. Thus, a separate unlocking tool is required for each type of housing. Since the assembly engineer seldom has the appropriate unlocking tool at hand, the contacts are usually damaged.

[0006] The object of this invention is therefore to provide an unlocking aid for unlocking contacts which are attached to a line and which are each received in the housing with a primary latching mechanism such that the assembly engineer always has an unlocking aid to hand and damage to the contacts is avoided.

[0007] This object is achieved with an electrical connector with the features of claim 1.

[0008] As a result of arranging the unlocking aid in the housing, the assembly engineer always has the appropriate unlocking aid available. Thus, the assembly engineer will not use any auxiliary tool, which always entails a risk of damaging the contacts. Because all the primary latching mechanisms of the contacts can be released at the same time using the unlocking aid, the housing can easily be separated from the line with the contacts attached.

[0009] The primary latching mechanisms are constructed in the form of latching springs on the contacts, and windows through which the unlocking aid presses the latching springs down to unlock them are provided in the housing at the locations of the primary latching mechanisms.

[0010] In accordance with a preferred embodiment, the unlocking aid is constructed in the form of a part which is separable from the plug, such as the secondary locking member for the contacts.

[0011] Similarly, it is also possible to construct the unlocking aid in one piece with the housing and to release the primary latching mechanisms of the contacts only by way of a pivotal mechanism.

[0012] Advantageous embodiments of the invention are disclosed in the sub-claims.

[0013] The invention will be explained in more detail below with reference to an example embodiment illustrated in the drawings, in which:

Figure 1 shows an oblique view of a plugging connection with an integrated unlocking aid;

Figure 2 shows- the plugging connection according to Figure 1 in an exploded view;

Figure 3 shows the view according to Figure 2 of the unlocking aid as used to release the primary latching mechanisms; and

Figures 4 to 6 show the unlocking procedure, in each case in a sectional illustration.

[0014] Figure 1 illustrates a plugging connection having the unlocking aid 1 according to the invention. The plugging connection comprises a housing 2 and a mating plug 3, each of which is connected to a line 5 by way of contacts 4 (not illustrated in Figure 1). In this example embodiment, the line 5 is constructed in the form of a flexible line, but could equally well be a low-profile (flat) line with a plurality of cores (leads) arranged next to one another.

[0015] Figure 2 shows the plugging connection according to Figure 1 in an exploded illustration. In this

illustration, the contacts 4 attached to the line 5 are visible. Constructed on the contacts 4, in the form of a primary latching mechanism 6, is a latching spring which latches into the corresponding windows 7 when the contacts 4 are inserted into the housing 2 (see also Figure 4 in this connection). The unlocking aid 1 is constructed to be separable from the housing 2 and may be pushed onto the housing 2 as illustrated in Figure 1, from the terminal side, that is to say from the side on which the line 5 is brought up to the housing 2. The unlocking aid is substantially U-shaped in cross-section and comprises a base wall 8, a rear wall 9 and a top wall 10. Arranged on the rear wall 9 are two protrusions 11 which are spaced from one another by the same amount as the windows 7 are in the housing 2. The protrusions 11 are dimensioned such that they may be inserted through the windows 7 from above.

[0016] To unlock the primary latching mechanism 6, the unlocking aid 1 as illustrated in Figure 2 is drawn off the housing 2 and placed on the housing 2 from above as illustrated in Figure 3 such that the protrusions 11 release the primary latching mechanism 6 through the windows 7. Figures 4 to 6 illustrate the three phases of release of the primary latching mechanism, with the housing 2, the unlocking aid 1 and the line 5 each being illustrated in section.

[0017] In Figure 4, the unlocking aid 1 is placed on the housing 2 with the protrusions 11 being inserted into the windows 7. The primary latching mechanism 6 of the contacts 4, which is constructed in the form of a latching spring, is still latched in the windows 7 in the state illustrated in Figure 4.

[0018] In Figure 5, the unlocking aid 1 already presses down on the housing 2, as a result of which the primary latching mechanism 6 is pressed into the contact 4 by means of the protrusions 11 and the contact 4 can be withdrawn from the housing 2, as illustrated in Figure 6.

[0019] The unlocking aid 1 abuts by means of its rear wall laterally with respect to the protrusions 11 against the upper side of the housing 2, as illustrated in Figures 5 and 6. This ensures that the primary latching mechanism 6 is only pressed down by an amount equivalent to the height of the protrusions 11 and thus the possibility of over-bending of the primary latching mechanism 6 is eliminated. Over-bending would carry a risk of the primary latching mechanism 6 being plastically deformed and the contacts 4 no longer being securely fixed when they are re-inserted into the housing 2.

[0020] In the example embodiment illustrated, the unlocking aid 1 is at the same time constructed to form a secondary securing means. For this purpose, the unlocking aid 1 has a continuous rib 12 on the underside of the top wall 10, and this continuous rib 12 is inserted into a corresponding recess 13 in the housing 2 in order to lock the contacts 4 in the housing 2 and hence (see Figures 4 and 5) reaches form-fittingly (in an interlocking manner) behind the contacts 4. As illustrated in Figure 1, the housing 2 is inserted into the mating plug 3 of box-

shaped construction with the unlocking aid 1 pushed on, so that it is no longer possible to lift off the unlocking aid upwards, and thus the secondary securing means also cannot be separated when the plugging connection is made.

[0021] The invention is not restricted to the example embodiment illustrated. For example, it is also possible to mount the unlocking means on a further part separable from the housing 2, or to leave the unlocking aid connected to the housing 2, so that for example the protrusions on the unlocking aid are pressed into the windows 7 in order to release the primary latching mechanism 6 only by way of a flap-type mechanism.

Claims

1. An electrical connector with an unlocking aid (1) for unlocking a plurality of contacts (4) that are attached to a line (5), the connector comprising a housing (2) and contacts (4) that are received in the housing (2) and latched thereto by way of a respective primary latching mechanism (6), the primary latching mechanism (6) being constructed in the form of a latching spring on each of the contacts (4), the housing (2) having windows (7), through which the unlocking aid (1) acts from the outside on the primary latching mechanism (6), the windows (7) being provided at those locations in the housing (2) where the primary latching mechanisms (6) of the contacts (4) are arranged, **characterised in that** the unlocking aid (1) is integrated in the housing (2) and provides protrusions (11), and that these are arranged in the same grid spacing as the windows (7) in the housing (2), so that all the primary latching mechanisms (6) of the contacts (4) can be released at the same time using the unlocking aid (1).
2. The electrical connector with the unlocking aid (1) according to claim 1, **characterised in that** the unlocking aid (1) is separable from the connector housing (2).
3. The electrical connector with the unlocking aid (1) according to claim 1 or 2, **characterised in that** the unlocking aid (1) is at the same time constructed to form a secondary securing means for the contacts (4).
4. The electrical connector with the unlocking aid (1) according to any one of claims 1 to 3, **characterised in that** the line (5) is constructed in the form of a flexible line (5).

Patentansprüche

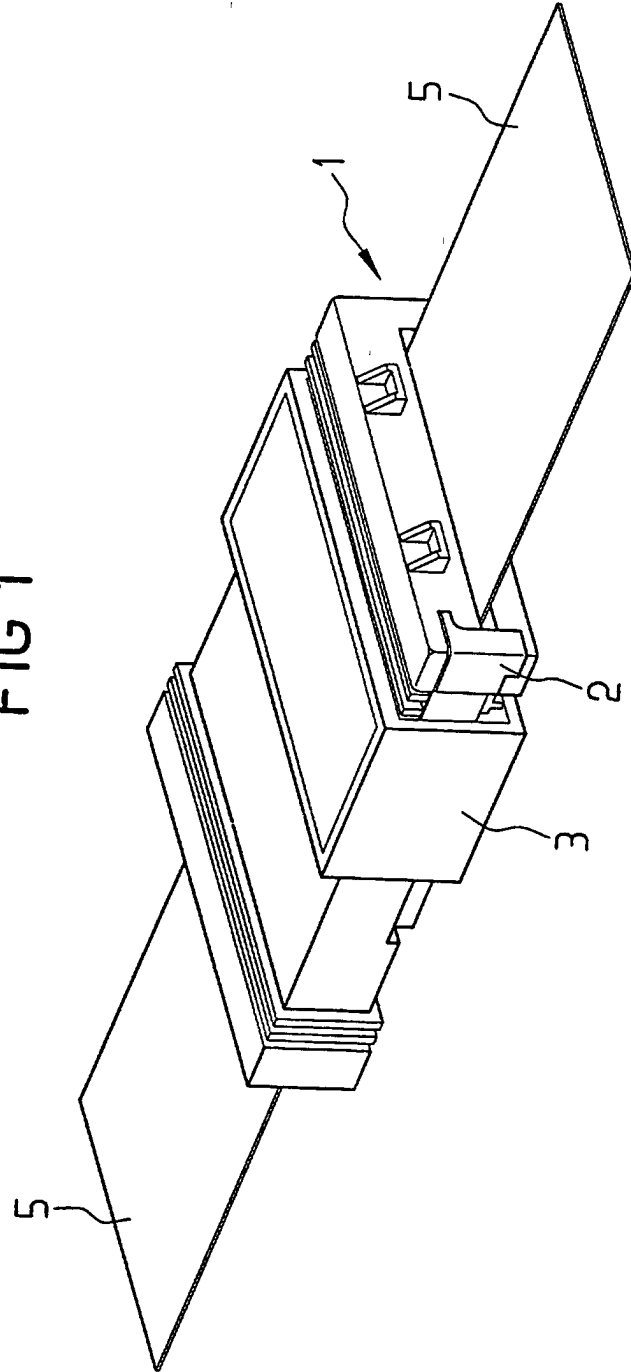
1. Elektrischer Verbinder mit einer Entriegelungshilfs-

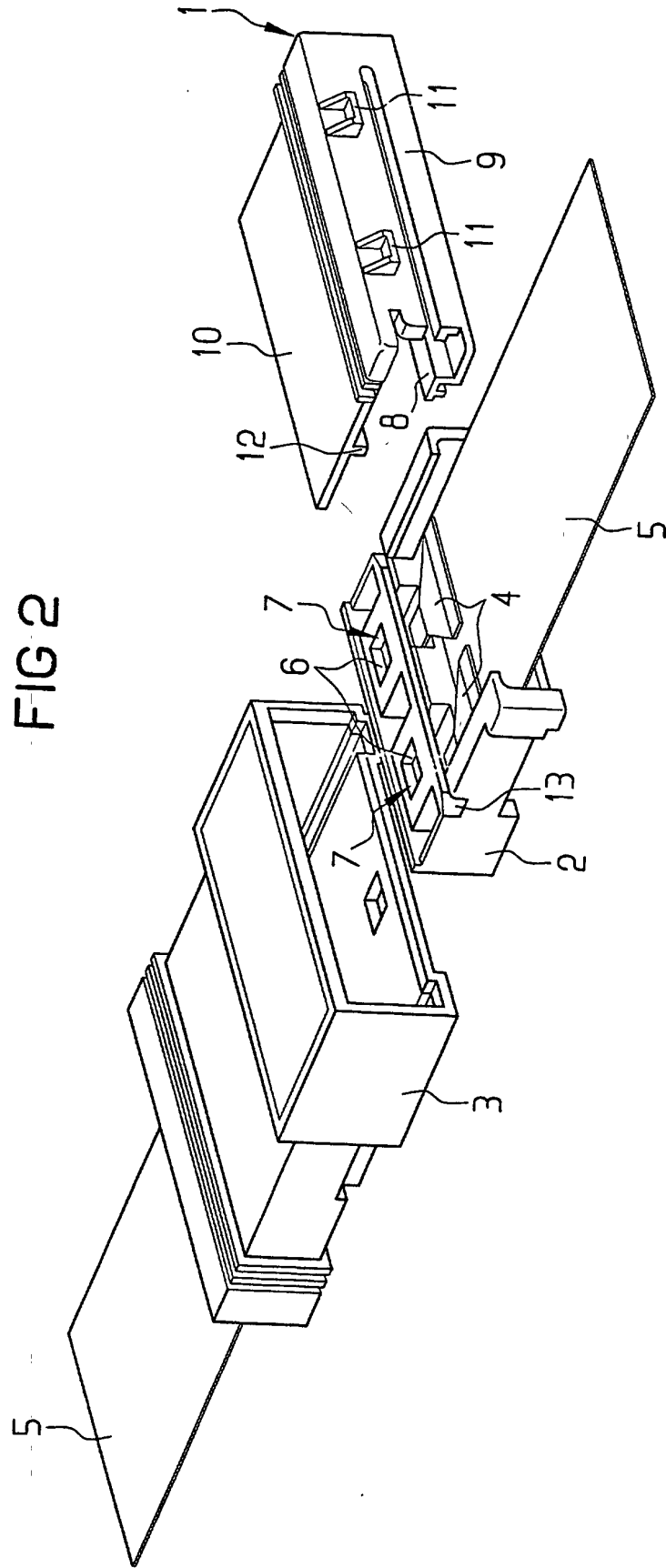
- einrichtung (1) für das Entriegeln einer Vielzahl von Kontakten (4), die an einer Leitung (5) befestigt sind, wobei der Verbinder ein Gehäuse (2) und Kontakte (4) aufweist, die im Gehäuse (2) aufgenommen werden und daran mittels eines entsprechenden primären Einklinkmechanismus (6) eingeklinkt werden, wobei der primäre Einklinkmechanismus (6) in der Form einer Einklinkfeder an jedem der Kontakte (4) konstruiert ist, wobei das Gehäuse (2) Fenster (7) aufweist, durch die die Entriegelungshilfseinrichtung (1) von außen auf den primären Einklinkmechanismus (6) wirkt, wobei die Fenster (7) an jenen Stellen im Gehäuse (2) vorhanden sind, wo die primären Einklinkmechanismen (6) der Kontakte (4) angeordnet sind, **dadurch gekennzeichnet, daß** die Entriegelungshilfseinrichtung (1) im Gehäuse (2) integriert ist und Vorsprünge (11) bereitstellt, und daß diese im gleichen Gitterabstand wie die Fenster (7) im Gehäuse (2) angeordnet sind, so daß alle primären Einklinkmechanismen (6) der Kontakte (4) gleichzeitig bei Benutzung der Entriegelungshilfseinrichtung (1) freigegeben werden können.
2. Elektrischer Verbinder mit der Entriegelungshilfseinrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, daß** die Entriegelungshilfseinrichtung (1) vom Verbindergehäuse (2) trennbar ist.
3. Elektrischer Verbinder mit der Entriegelungshilfseinrichtung (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** die Entriegelungshilfseinrichtung (1) gleichzeitig so konstruiert ist, daß sie eine sekundäre Sicherungseinrichtung für die Kontakte (4) bildet.
4. Elektrischer Verbinder mit der Entriegelungshilfseinrichtung (1) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** die Leitung (5) in der Form einer elastischen Leitung (5) konstruiert ist.
- l'agencement des mécanismes de verrouillage primaires (6) des contacts (4), **caractérisé en ce que** le moyen de déverrouillage (1) est intégré dans le boîtier (2) et forme des saillies (11), celles-ci étant agencées au même espacement de quadrillage que les fenêtres (7) dans le boîtier (2), de sorte que tous les mécanismes de verrouillage primaires (6) des contacts (4) peuvent être dégagés en même temps par l'intermédiaire du moyen de déverrouillage (1).
2. Connecteur électrique comportant un moyen de déverrouillage (1) selon la revendication 1, **caractérisé en ce que** le moyen de déverrouillage (1) peut être séparé du boîtier du connecteur (2).
3. Connecteur électrique comportant un moyen de déverrouillage (1) selon les revendications 1 ou 2, **caractérisé en ce que** le moyen de déverrouillage (1) est en même temps destiné à former un moyen de fixation secondaire des contacts (4).
4. Connecteur électrique comportant un moyen de déverrouillage (1) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la ligne (5) est constituée par une ligne flexible (5).

Revendications

1. Connecteur électrique comportant un moyen de déverrouillage (1) pour déverrouiller plusieurs contacts (4) fixés sur une ligne (5), le connecteur comprenant un boîtier (2) et des contacts (4) reçus dans le boîtier (2) et verrouillés sur celui-ci par un mécanisme de verrouillage primaire respectif (6), le mécanisme de verrouillage primaire (6) ayant la forme d'un ressort de verrouillage sur chacun des contacts (4), le boîtier (2) comportant des fenêtres (7), à travers lesquelles le moyen de déverrouillage (1) agit de l'extérieur sur le mécanisme de verrouillage primaire (6), les fenêtres (7) étant agencées dans le boîtier (2) au niveau des emplacements de

FIG 1





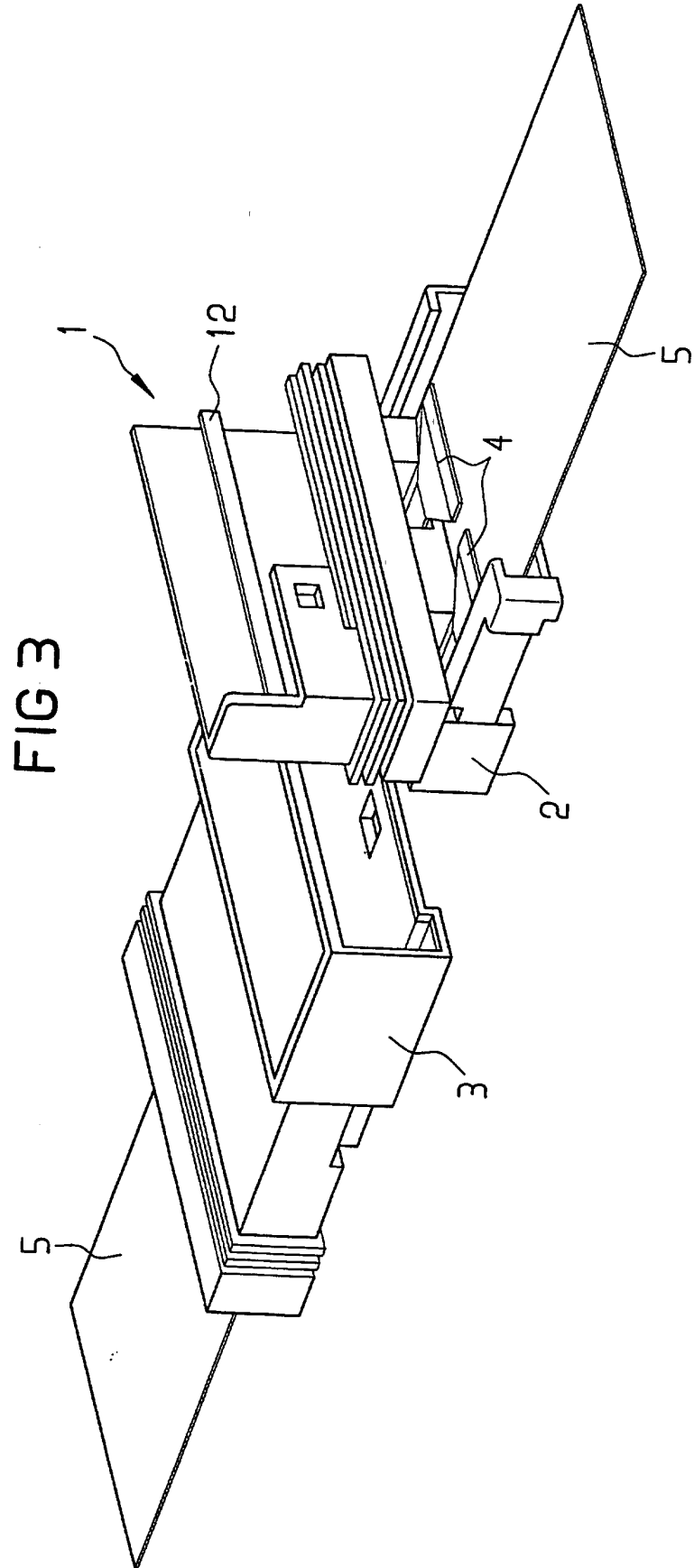


FIG 4

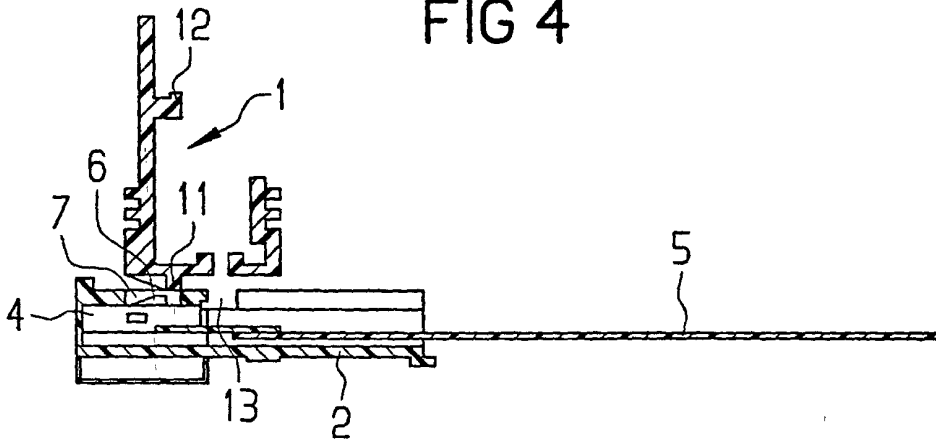


FIG 5

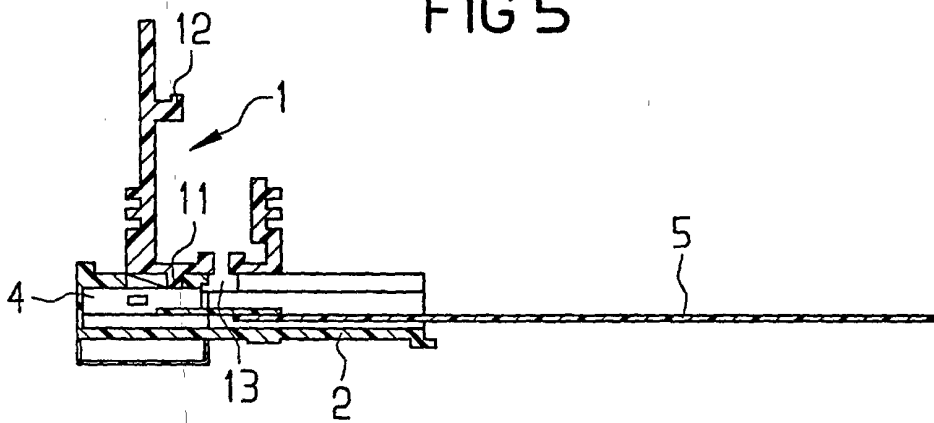


FIG 6

