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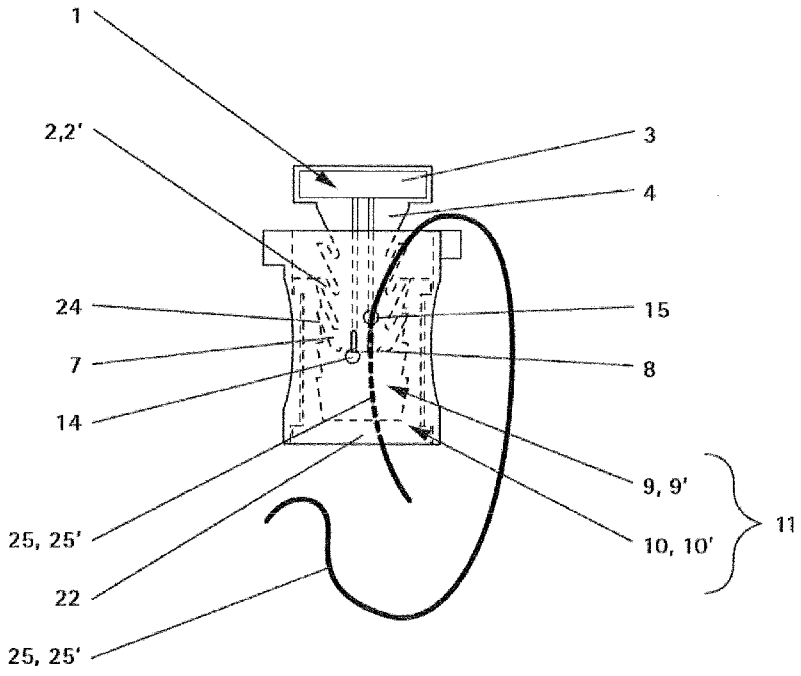
(54) Title: CABLE SEAL ASSEMBLY

Fig. 3



(57) Abstract: The present invention relates to a cable seal assembly comprising a box-shaped housing (11), a slide (1) with lachting means (2) being mounted therein in slidable and in interlockable manner, and a cable (25) being insertable in unlocked state via openings into the housing (11). Furthermore, the housing (11) comprises two parts (9; 10). The first part (9) is a female member (9') being open at its endings and comprising two openings (14; 15) in each of its side walls and wherein the second part (10) is a male member (10') which is mounted with the aid of clamping means to the inside of the female member (9').

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Cable seal assembly

The present invention relates to a cable seal assembly according the preamble of claim 1.

Such cable seal assemblies are generally known and widely used. Such cable seal assemblies include a security insert to help prevent tampering with the internal components of the cable seal. Prior art cable seal assemblies include a box-shaped housing, a slide which is mounted therein in a manner that enables it to be displaced and arrested, and an entry and exit opening for the cable, i.e. stranded wire is disclosed in WO 2005/086121.

An object of the present invention was to provide tamper proof cable seal assembly.

This object will be inventively solved by a cable seal assembly with features given in claim 1. Further embodiments according to the present invention are given in the features of the dependant claims.

A cable seal assembly according to the present invention comprises a box-shaped housing, a slide with lachting means being mounted therein in slidable and in interlockable manner, and a cable being insertable in unlocked state via openings into the housing. Furthermore, the housing comprises two parts. The first part is a female member being open at its endings and comprising two openings in each of its side walls and wherein the second part is a male member which is mounted with the aid of clamping means to the inside of the female member. Thus, the present

invention provides a tamper proof cable seal assembly, since any unauthorized manipulation will immediately be apparent. Furthermore, a complete closure of the cable seal assembly according to the present invention can be achieved in its completely assembled or sealed state, respectively, due to the multi-part implementation of the cable seal assembly. Thereby, any fraudulent attempt to manipulate the cable seal assembly according to the present invention will be brought into light.

In an embodiment of the present invention the female member comprises at each of its narrow sides a clamping shoulder wherein the corresponding clamping means of the male member are clamped into. Thereby, the housing can be pre-assembled before dispatch to the end user.

In another embodiment of the present invention the male member is U-shaped with two legs and has a bottom bar, each of its legs carrying the clamping mean at its end and the bottom bar is dimensioned such that it covers the bottom ending of the female part. Thereby, unauthorized access is prevented, once the male member is inserted into the female member.

In another embodiment of the present invention each of the legs comprises latching recesses for receiving the corresponding latching means. In another embodiment of the present invention the latching means of the slide are at least one pair of cams being interlockable into the corresponding at least one pair of latching recesses. Thereby, a secure interlocking connection can be provided,

since the slide cannot be removed anymore, once it fully has been inserted into the female member.

Another embodiment of the present invention is that the cams are teeth-like. Thereby, a form-locking connection is achieved.

A further embodiment of the present invention is that the slide comprises a bottom part and a tongue, wherein the tongue comprises cuts at its head. Thereby, the cable is retained securely in complete interlocked position of the cable seal assembly according to the present invention.

Another embodiment of the present invention is that the slide is coniferous tree shaped and comprises two canals running in longitudinal direction an axis. Thereby, the latching means can engage easily into the corresponding latching recesses by inserting the slide completely into the first part.

Another embodiment of the present invention is that the housing and the slide are out of transparent material. Thereby, any fraudulent attempt to manipulate the cable seal assembly according to the present invention will immediately be brought into light.

Another embodiment of the present invention is that the cable is a stranded wire.

A further embodiment of the present invention is that the cable is out of metal or out of another material.

An example of the present invention will be described in more details with reference to the drawings, in which is shown in

Fig. 1 schematically, an example of a front view of a cable seal assembly according to the present invention in its unmounted state;

Fig. 2 schematically, an example of a front view of a cable seal assembly according to the present invention in its partly mounted state; and

Fig. 3 schematically, an example of a front view of a cable seal assembly according to the present invention in its pre-assembled state.

Herewith, it is noted that same reference signs used in different figures refer to the same technical features.

Figure 1 schematically, shows an example of a front view of a cable seal assembly according to the present invention in its unmounted state. The cable seal assembly comprises a slide 1 with latching means 2 being three pair of cams 2'. The slide 2 has a bar-like shaped bottom part 3 from which a tongue 4 protrudes comprising the latching means 2. The tongue 4 comprises two canals 5, 6 arranged in a longitudinal direction of an axis A. A head 7 of the tongue 4 comprises cuts 8. The shape of the slide 2 is coniferous tree-like. Furthermore, figure 1 shows a first part 9 being a female member 9' and a second part 10 being a male member 10'. The first and the second parts 9, 10 together form a box-shaped housing 11. The female member 9' comprises wide side walls 12, 12'. The first side wall 12 is the front side wall and the second side wall 12' is the rear side wall as depicted in figure 1. Each of the side walls 12, 12' has two openings 14, 14', 15, 15'. The openings 14, 14' are arranged in offset manner to the further openings 15,

15', i.e. in diagonally offset manner for example. The female member 9' is a hollow body with open endings 16, 17. The female member 9' comprises at its narrow sides 18, 19 respectively a clamping shoulder 20 to the inside. The clamping shoulder 20 serves to receive one of the corresponding clamping means 21 of the male member 10'. The U-shaped male member 10' comprises a bottom bar 22 and two legs 23 with latching recesses 24 for receiving the corresponding latching means 2 in closed state of the cable seal assembly according to the present invention. The latching recesses 24 are teeth-like shaped.

Figure 2 schematically, shows an example of a front view of a cable seal assembly according to the present invention in its partly mounted state. The male member 10' is inserted into the female member 9' such that the clamping means 21 engage into the corresponding clamping shoulder 20. The lower ending 17 of the female member 9' is covered by the bottom bar 22 such that the inside of the housing 11 is not accessible anymore via the ending 17. In this view, only the openings 14, 15 of the front wall are depicted, since the other openings of the rear wall lie behind in congruent manner.

Figure 3 schematically, shows an example of a front view of a cable seal assembly according to the present invention in its pre-assembled state. The slide 1 is partly inserted to the housing 11 and a cable 25 being a stranded wire 25' is inserted into the opening 15, i.e. being an entry opening. Herewith, the cable seal assembly according to the invention in its pre-assembled state, i.e. partly

interlocked state, is ready for dispatch to the end user. The partly interlocked state is defined in that the slide 1 is inserted into the female member 9' until the first pair of latching means 2 engage into the corresponding first pair of the latching recesses 24. The end user will utilize the cable seal assembly according to the present invention for sealing current meters for example. In order to interlock the cable assembly according to the present invention, the cable 25 is inserted into the further opening 14, i.e. being an exit opening. After that the slide 1 can be brought into complete interlocked state in sliding the slide 1 completely into the female member 9', i.e. until the head 7 of the tongue 4 reaches the bottom bar 22 of the male member 10'. Therewith, the three pairs of latching means 2 engage into the corresponding latching recesses 24. It is also conceivable that there are arranged less or more than three pairs of latching means 2 and corresponding latching recesses 24. The cable 25 is hold in its position, once the cable 25 is clamped between the head 7 of the tongue 4 and the bottom bar 22 of the male member 9', the cable 25 cannot be removed without manipulating the housing 11. Furthermore, the cable 25 particularly engages into the cuts 8 in complete interlocked state of the cable seal assembly according to the present invention. The cable 25 can be out of metal or out of another material, e.g. out of a resin or alike. The housing 11 and the slide 1 are out of a transparent material. These parts can be injection-moulded parts. Almost no weak points for a fraudulent manipulation attempt, i.e. openings or grooves for example are accessible in a complete closure state of the cable

seal assembly according to the present invention due to the multi-part implementation of the cable seal assembly.

Claims

1. Cable seal assembly comprising a box-shaped housing (11), a slide (1) with lachting means (2) being mounted therein in slidable and in interlockable manner, and a cable (25) being insertable in unlocked state via openings (14, 14'; 15, 15') into the housing (11), characterized in that the housing (11) comprises two parts (9; 10), wherein the first part (9) is a female member (9') being open at its endings (16; 17) and comprising two openings (14, 14'; 15; 15') in each of its side walls (12; 12') and wherein the second part (10) is a male member (10') which is mounted with the aid of clamping means (21) to the inside of the female member (9').

2. Cable seal assembly according to claim 1, characterized in that the female member (9') comprises at each of its narrow sides (18; 19) a clamping shoulder (20) wherein the corresponding clamping means (21) of the male member (10') are clamped into.

3. Cable seal assembly according to claim 1 or 2, characterized in that the male member (10') is U-shaped with two legs (23) and has a bottom bar (22), each of its legs (23) carrying the clamping mean (21) at its end and the bottom bar (22) is dimensioned such that it covers the bottom ending (17) of the female part (9').

4. Cable seal assembly according to claim 3, characterized in that each of the legs (23) comprises latching recesses (24) for receiving the corresponding latching means (2).

5. Cable seal assembly according to one of the claims 1 to 4, characterized in that the latching means (2) of the slide (1) are at least one pair of cams (2') being interlockable into the corresponding at least one pair of latching recesses (24).

6. Cable seal assembly according to claim 5, characterized in that the cams (2') are teeth-like.

7. Cable seal according to one of the claims 1 to 6, characterized in that the slide (1) comprises a bottom part (3) and a tongue (4), wherein the tongue (4) comprises cuts (8) at its head (7).

8. Cable seal assembly according to one of the claims 1 to 7, characterized in that the slide (1) is coniferous tree shaped and comprises two canals (5; 6) running in longitudinal direction a an axis (A).

9. Cable seal assembly according to one of the claims 1 to 8, characterized in that the housing (11) and the slide (1) are out of transparent material.

10. Cable seal assembly according to one of the claims 1 to 9, characterized in that the cable (25) is a stranded wire (25').

11. Cable seal assembly according to claim 1 or claim 10, characterized in that the cable (25) is out of metal or out of another material.

Fig. 1

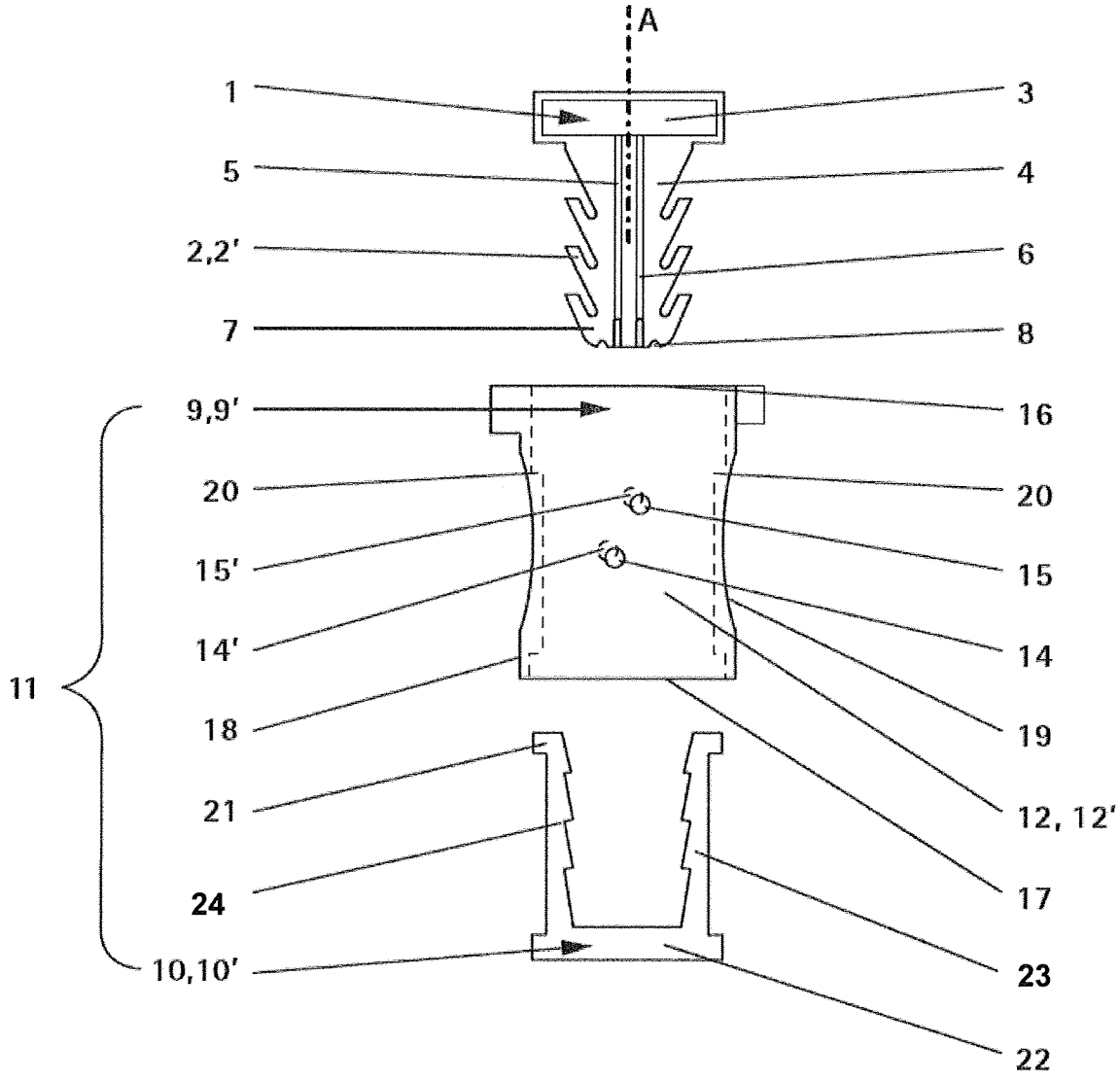
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Fig. 2

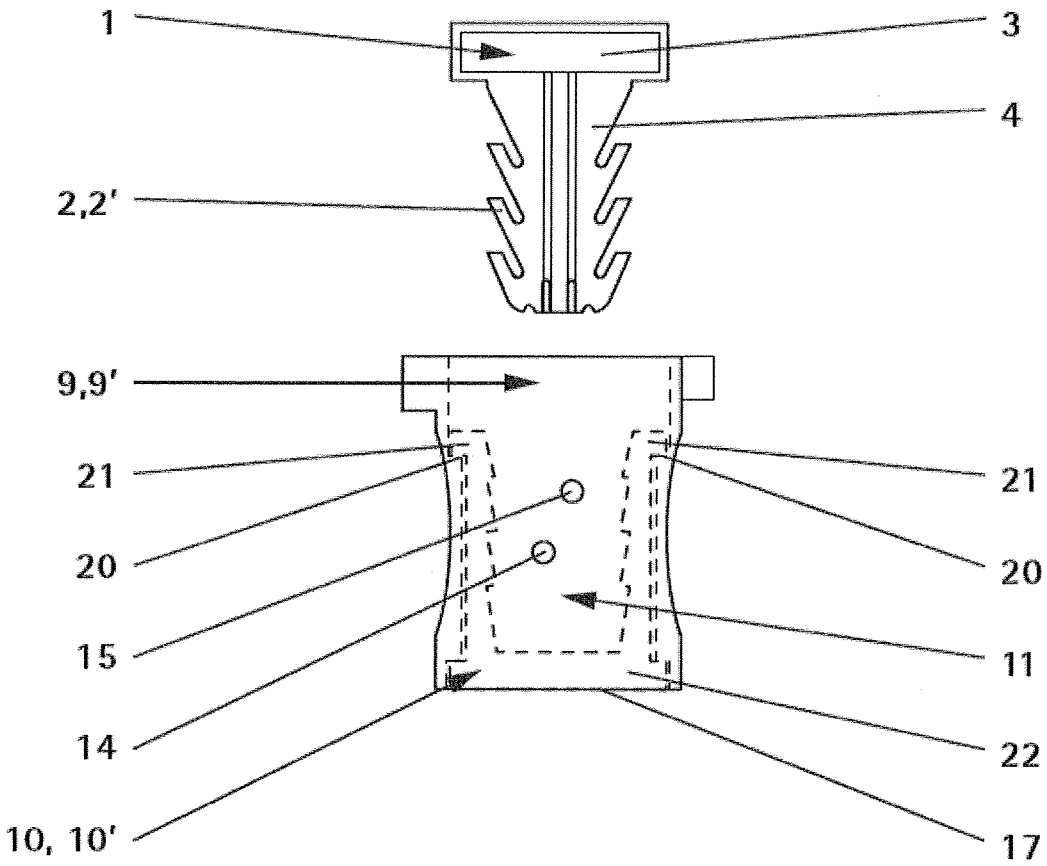
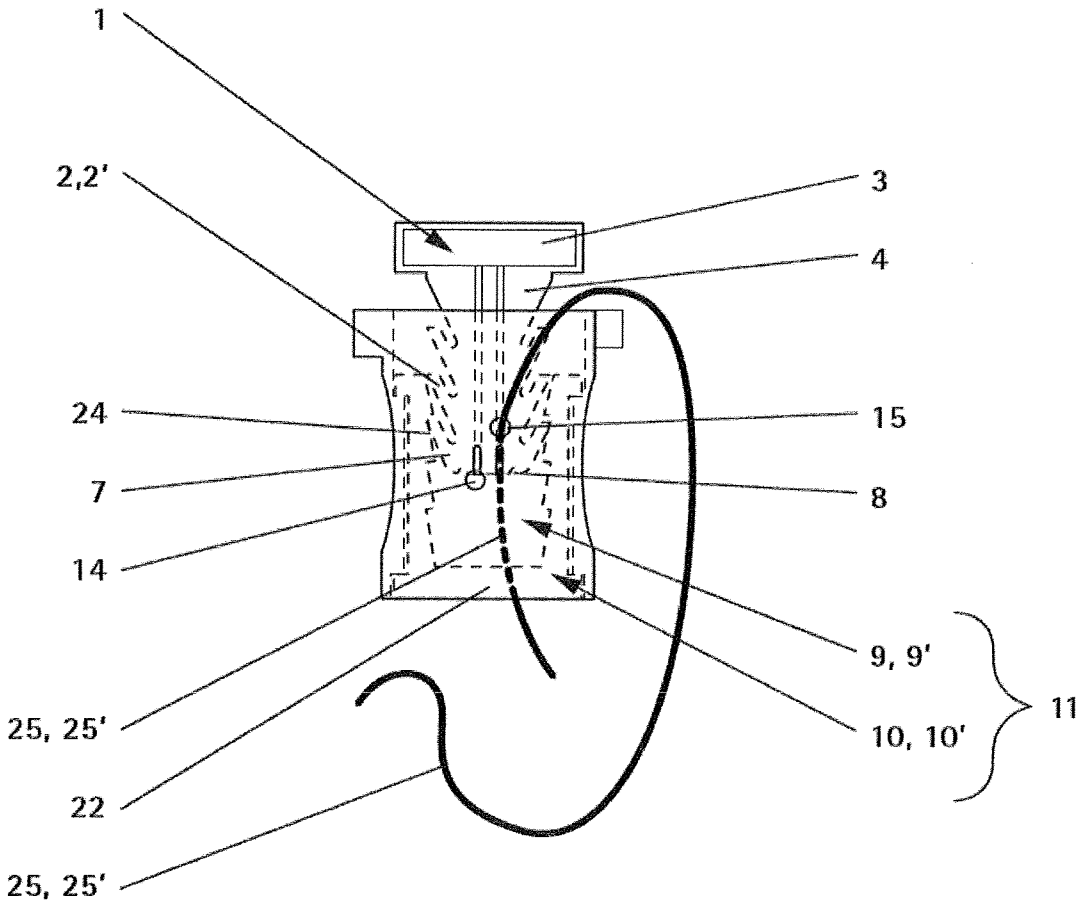


Fig. 3



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/057263

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16G11/04
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F16G A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 649 340 A (IDA KAZUO [JP]) 22 July 1997 (1997-07-22) figures 1-3 column 4, line 64 - column 6, line 6	1-11
A	WO 02/087415 A2 (POLY 4 MEDICAL INC [US]) 7 November 2002 (2002-11-07) figure 10	1,5,6,8, 10,11
A	WO 2005/124187 A2 (KINAMED INC [US]; MATTCHEN TERRY M [US]) 29 December 2005 (2005-12-29) figures 1,2	1,8,10, 11

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 February 2011	11/02/2011

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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