(19) Europäisches Patentamt
European Patent Office
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(11) EP 2 615 702 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
17.07.2013 Bulletin 2013/29

(51) Int Cl.:
H01R 43/01 *(2006.01)*

(21) Application number: **12151082.0**

(22) Date of filing: **13.01.2012**

(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

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(54) Termination tool

(57) A termination tool (10) for telecommunication copper wires, namely for connecting unconnected telecommunication copper wires with contacts of a distribution element and for disconnecting connected telecommunication copper wires from contacts of a distribution element, comprising a basic body (11) having a first end (12) and a second end (13), where a first connecting element (14), adapted to connect unconnected telecommunication copper wires with a first kind of distribution element contacts, is attached to the first end (12) of the basic body (11), and where a second connecting element (22), adapted to connect unconnected telecommunication copper wires with a second kind of distribution element contacts, and a third connecting element (23), adapted to connect unconnected telecommunication copper wires with a third kind of distribution element contacts, are both attached to the second end (13) of the basic body (11).

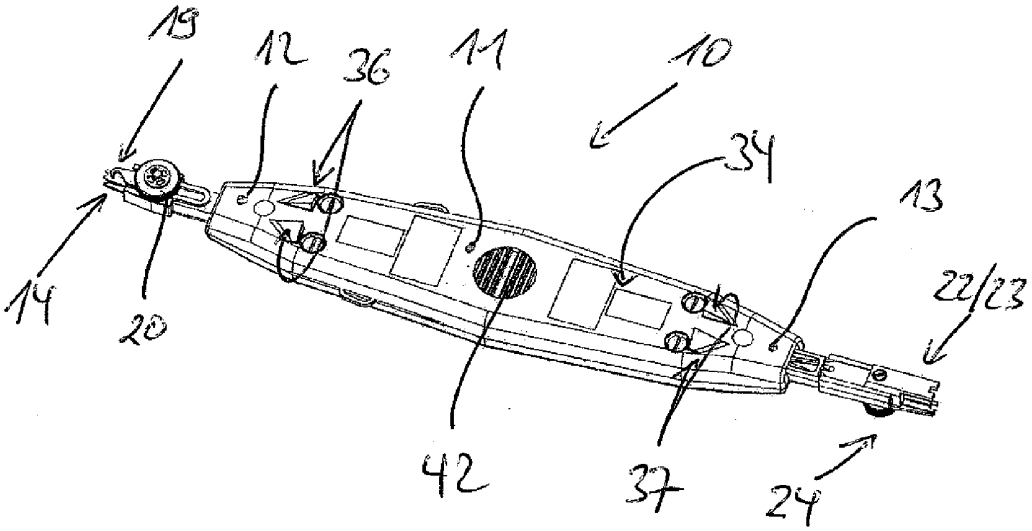

Fig. 1

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Description

[0001] The present patent application relates to a termination tool for telecommunication copper wires.

[0002] The product catalogue "Accessories for Copper Communication Networks, Page 71, Corning Cable Systems, Edition 1, year 2000" discloses a termination tool for telecommunication copper wires. This termination tool comprises a basic body having a first end and a second end. To the first end of the basic body there is attached a connecting element for connecting unconnected telecommunication copper wires with contacts of a distribution element by punching the copper wires into distribution element contacts. Further on, a hook-like disconnecting element is attached to the first end of the basic body for disconnecting connected telecommunication copper wires from contacts of a distribution element by removing the copper wires from the distribution element contacts. The second end of the basic body serves as a handle.

[0003] Another termination tool is known from the product leaflet "ComProtect 2/1 CP ASU2410 A1, Installation Instructions, Page 5, ADC Telecommunications, ADCP-81-601, Issue 1, Year 2005". This termination tool also comprises a basic body having a first end and a second end, where the connecting element is attached to the first end of the basic body and where the disconnecting element is attached to the second end of the basic body. The disconnecting element is pivotably attached to the second end of the basic body so that, in a first relative position of the same relative the basic body, the disconnecting element can be used for the disconnection function of the termination tool and that, in a second position of the same relative the basic body, the second end of the basic body serves as a handle.

[0004] The termination tools known from the prior art can only be used to establish a connection of unconnected telecommunication copper wires with a defined kind of distribution element contacts, especially with a defined kind of IDC (Insulation Displacement Contacts) contacts. Due to the fact that different manufactures of distribution elements use different kinds of IDC contacts and that the known termination tools can only be used to establish connections of unconnected telecommunication copper wires with one kind of IDC contacts, installers need a huge number of different termination tools for their installation work in the field. When using a wrong termination tool, namely when using a termination tool having a connecting element being adapted to a defined kind of IDC contacts to establish connections of copper wires with a different kind of IDC contacts, the IDC contacts can be damaged or destroyed.

[0005] The present application is based on the problem of providing a novel termination tool being suitable for establishing connections of unconnected telecommunication copper wires with different kinds of contacts of a distribution element so that the number of termination tools needed by installers can be decreased.

[0006] The termination tool according to the present patent application comprises a basic body having a first end and a second end. A first connecting element, adapted for connecting unconnected telecommunication copper wires with a first kind of distribution element contacts, is attached to the first end of the basic body. A second connecting element, adapted for connecting unconnected telecommunication copper wires with a second kind of distribution element contacts, and a third connecting element, adapted for connecting unconnected telecommunication copper wires with a third kind of distribution element contacts, are both attached to the second end of the basic body. The termination tool can be used to establish connections of unconnected telecommunication copper wires with at least three different kinds distribution element contacts so that the number of termination tools needed by installers can be decreased. Preferably, the first connecting element is fixedly attached to the first end of the basic body. The first connecting element is designed in such a way that the same is adapted for establishing connections of unconnected telecommunication copper wires with the majority of distribution element contacts installed in the field. The second connecting element and the third connecting element are both provided by a common head being turnably attached to the second end of the basic body, where, in a first relative position of the common head relative to the basic body, the same provides the second connecting element, and where, in a second relative position of the common head relative to the basic body, the same provides the third connecting element. The second connecting element and the third connecting element are designed in such a way that the same are adapted for establishing connections of unconnected telecommunication copper wires with two other kinds of distribution element contacts installed in the field. Preferably, the termination tool comprises a cover being attachable to the first end of the basic body and to the second end of the basic body, where when the cover is attached to the first end of the basic body, the cover covers the first connecting element so that the first end of the basic body serves as handle, and where when the cover is attached to the second end of the basic body, the cover covers the second and third connecting elements so that the second end of the basic body serves as handle. This provides easy handling of the termination tool by installers in the field.

[0007] Preferred embodiments of the termination tool are given in the dependent claims and the description below. An exemplary embodiment will be explained in more detail with reference to the drawing, in which:

Figure 1	shows a top view of a termination tool according to a preferred embodiment;
Figure 2	shows a bottom view of the termination tool according to Figure 1;
Figure 3	shows a detail of a first end of the termination tool according to Fig-

ures 1 and 2;

Figure 4a and 4b show a detail of a second end of the termination tool according to Figures 1 and 2;

Figure 5 shows a cover of the termination tool;

Figure 6 shows the termination tool according to Figures 1 and 2 with the cover according to Figure 5 being attached to the first end of the termination tool; and

Figure 7 shows the termination tool according to Figures 1 and 2 with the cover according to Figure 5 being attached to the second end of the termination tool.

[0008] The present patent application relates to a termination tool 10 for telecommunication copper wires, namely for connecting unconnected telecommunication copper wires with contacts, especially with IDC contacts, of a distribution element and for disconnecting connected telecommunication copper wires from contacts of a distribution elements.

[0009] The termination tool 10 comprises a basic body 11 having a first end 12 and a second end 13. A first connecting element 14 being adapted to connect unconnected telecommunication copper wires with a first kind distribution element contacts is attached to the first end 12 of the basic body 11. The first connecting element 14 is preferably fixedly attached to the first end 12 of the basic body 11. The first connecting element 14 is adapted for establishing connections of unconnected telecommunication copper wires with the majority of distribution element contacts installed in the field by punching the respective copper wires into respective distribution element contacts.

[0010] The first connecting element 14 comprises two contacting legs 15 and 16 (see Figure 3). The contacting legs 15 16 have recesses 17, 18 receiving copper wires when punching the copper wires into respective distribution element contacts. Both contacting legs 15 and 16 are fixedly attached to the first end 12 of the basic body 11.

[0011] Preferably, to the first end 12 of the basic body 11 to which the first connecting element 14 is attached, there is also attached a hook-like disconnecting element 19 for disconnecting connected telecommunication copper wires from contacts of a distribution element by removing the copper wires from the distribution element contacts.

[0012] The hook-like disconnecting element 19 is moveably attached to the first end 12 of the basic body 11. The hook-like disconnecting element 19 is moveable in linear direction relative to the basic body 11. The relative position of the hook-like disconnecting element 19 relative to the basic body 11 can be secured by a screw-like securing element 20.

[0013] In a first status of the screw-like securing element 20, the hook-like disconnecting element 19 is moveable relative to the basic body 11, and in a second status of the screw-like securing element 20, the relative position of the hook-like disconnecting element 19 is fixed.

[0014] The relative movement of the hook-like disconnecting element 19 in linear direction of the basic body 11 relative to the same is defined by an oblong hole 21 within the hook-like disconnecting element 19 into which the screw-like securing element 20 is projecting.

[0015] Preferably, to the first end 12 of the basic body 11 to which the first connecting element 14 is attached, there is also attached a first cutting element 38. The cutting element 38 can be used to cut excess wire length of the copper wires.

[0016] A second connecting element 22 being adapted to connect unconnected telecommunication copper wires with a second kind of distribution element contacts is attached the second end 13 of the basic body 11. Further on, and a third connecting element 23 being adapted to connect unconnected telecommunication copper wires with a third kind of distribution element contacts is attached to the second end 13 of the basic body 11.

[0017] The second connecting element 22 and the third connecting element 23 are both provided by a common head 24. In a first relative position of the common head 24 (see Figure 4a), the same provides the second connecting element 22. In a second relative position of the common head 24 (see Figure 4b), the same provides the third connecting element 23.

[0018] The common head 24 comprises a first contacting leg 25 being fixedly attached to the second end 13 of the basic body 11 and a second contacting leg 26 being turnably attached to the second end 13 of the basic body 11. In a first relative position of the second contacting leg 26 (see Figure 4a), a first end 27 of the same provides, together with the first contacting leg 25, the second connecting element 22. In a second relative position of the second contacting leg 26 (see Figure 4b), a second end 28 of the same provides, together with the first contacting leg 25, the third connecting element 23. Both ends of the second contacting leg 26 and the first contacting leg 26 have recesses 29, 30, 31 for receiving copper wires when punching the copper wires into respective distribution element contacts.

[0019] The relative position of the second contacting leg 26 relative to the basic body 11 can be secured by a screw-like securing element 32. In a first status of the screw-like securing element 32, the second contacting leg 26 is turnable relative to the first contacting leg 25, and in a second status of the screw-like securing element 32, the relative position of the second contacting leg 26 is fixed.

[0020] As can be best seen in Figures 4a and 4b, the common head 24 comprises, in addition to the turnable second contacting leg 26, resting elements 40, 41 being turnable together with the second contacting leg 26. The resting elements 40, 41 support the copper wires when

punching the same into respective distribution element contacts.

[0021] The resting element 40 is I-shaped and the resting elements 41 are T-shaped. The shape of the resting elements 40, 41 is adapted to the respective distribution element contacts.

[0022] Preferably, there is also attached a second cutting element 39 to the second end 13 of the basic body 11 to which the second and third connecting elements 22, 23 are attached. The cutting element 39 can also be used to cut excess wire length of the copper wires.

[0023] The termination tool 10 further comprises a cover 33 (see Figure 5) being attachable to the first end 12 of the basic body 11 and to the second end 13 of the basic body 11.

[0024] When the cover 33 is attached to the first end 12 of the basic body 11 (see Figure 7), the cover 33 covers the first connecting element 14 so that the first end 12 of the basic body 11 serves as a handle or a smooth, continuous gripping surface, providing leverage for operating the features of the second end 13, without exposing the operator's hand to the features of the first end 12. When the cover 33 is attached to the first end 12 of the basic body 11, the same also covers the hook-like disconnecting element 19 and the first cutting element 38.

[0025] When the cover 33 is attached to the second end 13 of the basic body 11 (see Figure 6), the cover 33 covers the second connecting element 22 and third connecting element 23 so that the second end 13 of the basic body 11 serves as the handle or the smooth, continuous gripping surface. When the cover 33 is attached to the second end 13 of the basic body 11, the same covers also the second cutting element 39.

[0026] This feature provides an easy handling of the termination tool 10 by installers in the field.

[0027] The basic body 11 has two opposite sides extending between the first end 12 and the second end 13 of the same. A first side 34 provides an upper side and a second side 35 provides a lower side of the basic body 11.

[0028] Latching hooks 36 and 37 are assigned both said sides 34 and 35 of the basic body 11 adjacent to the first end 12 of the basic body 11 and to the second end 13 of the basic body 11. The latching hooks 36 and 37 hold the cover 33 to the basic body 11 when the same is attached to the first end 12 of the basic body 11 (see Figure 7) or to the second end 13 of the basic body 11 (see Figure 6).

[0029] The termination tool 10 further comprises a turnable knob 42. In a first relative position of the knob 42 (see Figures 1, 2, 6 and 7), the same blocks linear movement of the respective connecting element 14, 22, 23 relative to the respective cutting element 38, 39 when punching the copper wires into respective distribution element contacts. In the first relative position of the knob 42, the respective connecting element 14, 22, 23 is active and the respective cutting element 38, 39 is inactive.

[0030] In a second relative position of the knob 42 (not shown), in which the same is rotated by approximately 90° relative to the first relative position, the same allows a linear movement of the respective connecting element 14, 22, 23 relative to the respective cutting element 38, 39 so that the respective connecting element 14, 22, 23 is inactive and the respective cutting element 38, 39 is active. This linear movement of the respective connecting element 14, 22, 23 is directed inwardly into the basic body 11. This inwardly directed relative movement of the respective connecting element 14, 22, 23 relative to the respective cutting element 38, 39 has to overcome a spring force of a spring element (not shown) positioned inside the basic body. The spring force tends to press the respective connecting element 14, 22, 23 outwardly out of the basic body 11. In the second relative position of the knob 42, it is not possible to punch the copper wires into respective distribution element contacts. However, it is possible to cut excess wire length of the copper wires.

List of reference numerals

[0031]

10	termination tool
11	basic body
12	first end
13	second end
14	first connecting element
15	contacting leg
16	contacting leg
17	recess
18	recess
19	hook-like disconnecting element
20	screw-like securing element
21	oblong hole
22	second connecting element
23	third connecting element
24	head
25	contacting leg
26	contacting leg
27	first end

28 first end

29 recess

30 recess

31 recess

32 screw-like securing element

33 cover

34 first side

35 second side

36 latching hook

37 latching hook

38 cutting element

39 cutting element

40 resting element

41 resting element

42 knob

Claims

1. A termination tool (10) for telecommunication copper wires, namely for connecting unconnected telecommunication copper wires with contacts of a distribution element and for disconnecting connected telecommunication copper wires from contacts of a distribution element, comprising a basic body (11) having a first end (12) and a second end (13), wherein a first connecting element (14), adapted to connect unconnected telecommunication copper wires with a first kind of distribution element contacts, is attached to the first end (12) of the basic body (11), **characterised in that** a second connecting element (22), adapted to connect unconnected telecommunication copper wires with a second kind of distribution element contacts, and a third connecting element (23), adapted to connect unconnected telecommunication copper wires with a third kind of distribution element contacts, are both attached to the second end (13) of the basic body (11).

2. The termination tool as claimed in claim 1, **characterised in that** the second connecting element (22) and the third connecting element (23) are both provided by a common head (24), wherein in a first relative position of the common head (24) the same provides the second connecting element (22), and wherein a second relative position of the common head (24) the same provides the third connecting element (23).

3. The termination tool as claimed in claim 2, **characterised in that** the common head (24) comprises a first contacting leg (25) fixedly attached to the second end (13) of the basic body (11) and a second contacting leg (26) turnably attached to the second end (13) of the basic body (11).

4. The termination tool as claimed in claim 3, **characterised in that** in a first relative position of the second contacting leg (26) the same provides, together with the first contacting leg (25), the second connecting element (22), and that in a second relative position of the second contacting leg (26) the same provides, together with the first contacting leg (25), the third connecting element (23).

5. The termination tool as claimed in one of claims 1 to 4, **characterised in that** the first connecting element (14) is fixedly attached to the first end (12) of the basic body (11).

6. The termination tool as claimed in one of claims 1 to 5, **characterised in that** a hook-like disconnecting element (19) for disconnecting connected telecommunication copper wires from contacts of a distribution element is attached to the first end (12) of the basic body (11).

7. The termination tool as claimed in claim 6, **characterised in that** the disconnecting element (19) is moveably attached to the first end (12) of the basic body (11).

8. The termination tool as claimed in one of claims 1 to 7, **characterised by** a cover (33) being separately attachable to both the first end (12) and the second end (13) of the basic body (11).

9. The termination tool as claimed in claim 8, **characterised in that** when the cover (33) is attached to the first end (12) of the basic body (11), the cover (33) covers the first connecting element (14) so that the first end (12) of the basic body (11) serves as a handle, and that when the cover (33) is attached to the second end (13) of the basic body (11), the cover (33) covers the second and third connecting elements (22, 23) so that the second end (13) of the basic body (11) serves as the handle.

10. The termination tool as claimed in one of claims 1 to 9, **characterised by** cutting elements (38, 39) attached to both ends (12, 13) of the basic body (11).

11. The termination tool as claimed in claim 10, **characterised in that** a first cutting element (38) is attached to the first end (12) of the basic body (11), wherein the first cutting element (38) is covered when the cover (33) is attached to the first end (12) of the basic body (11).

12. The termination tool as claimed in claim 10 or 11, **characterised in that** a second cutting element (39) is provided adjacent to the second end (13) of the basic body (11), wherein the second cutting element (39) is covered when the cover (33) is attached to the second end (13) of the basic body (11).

13. The termination tool as claimed in one of claims 7 to 12, **characterised by** a turnable knob (42), wherein in a first relative position of the knob (42) the same blocks a linear movement of the connecting elements (14, 22, 23) relative to the cutting elements (38, 39), and wherein in a second relative position of the knob (42) the same allows a linear movement of the connecting elements (14, 22, 23) relative to the cutting elements (38, 39).

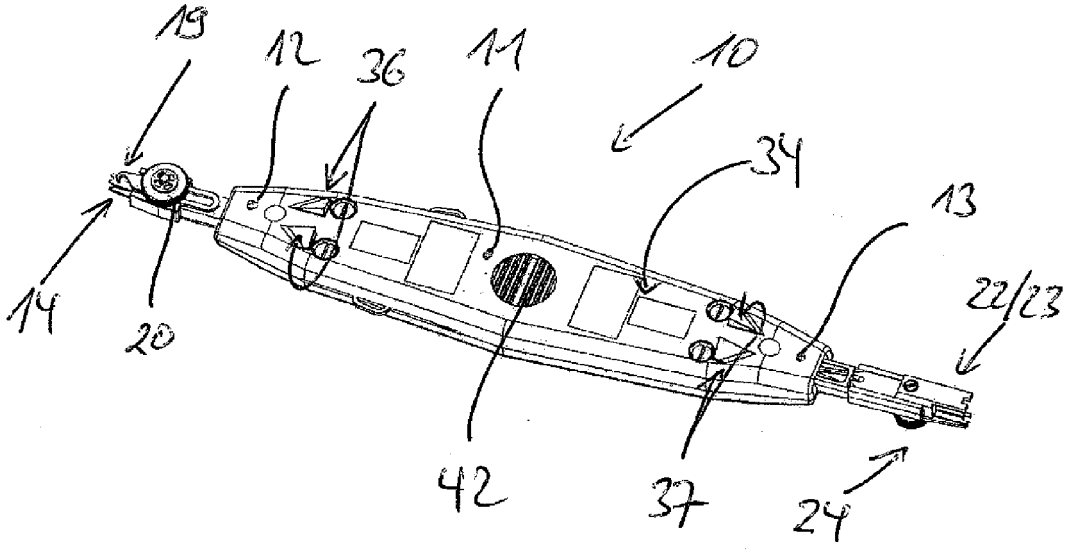
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Fig. 1

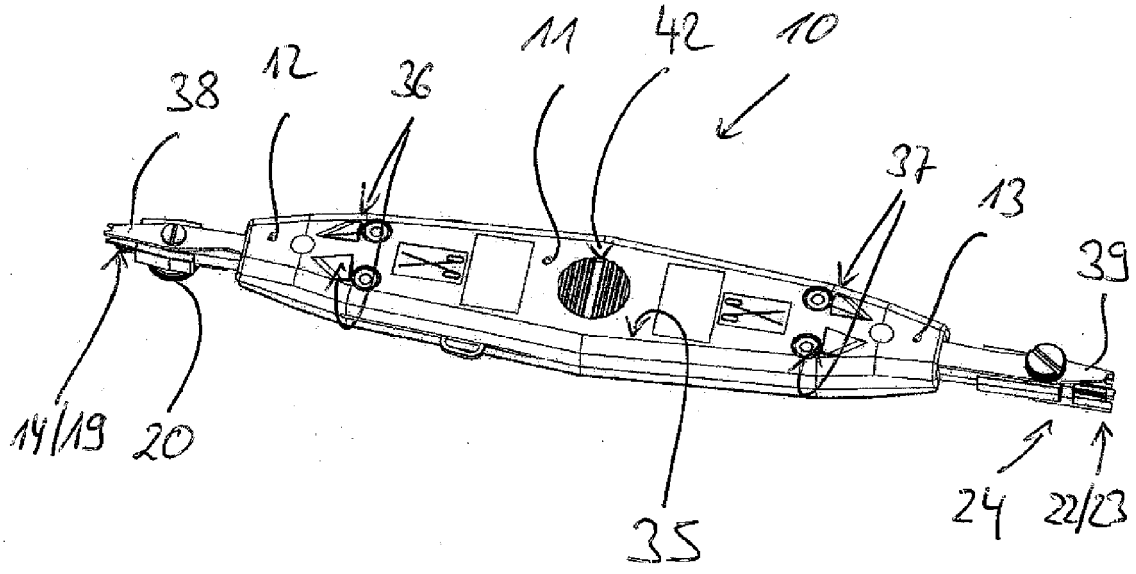
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Fig. 2

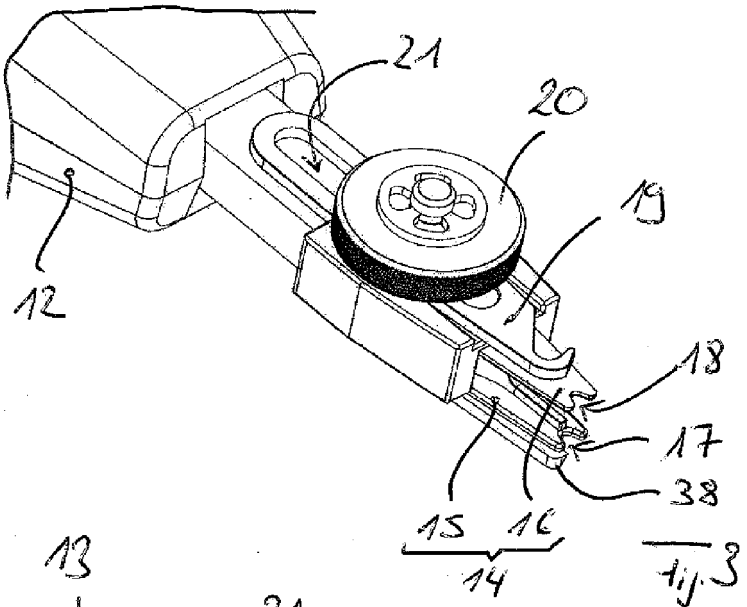

Fig. 3

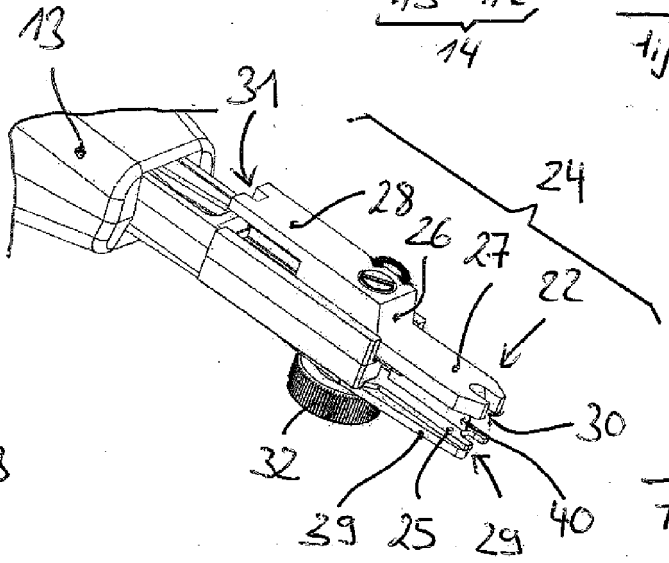

Fig. 4a

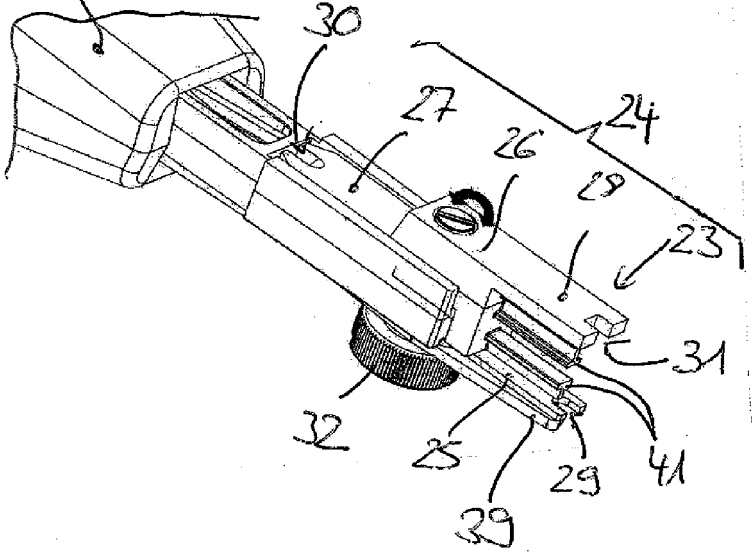

Fig. 4b

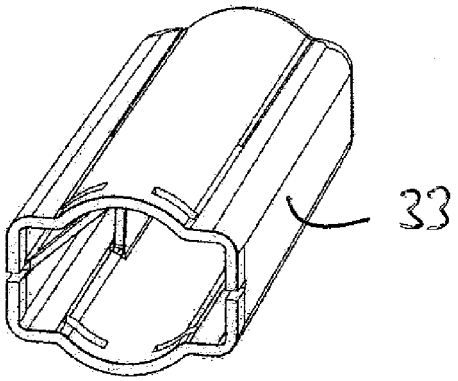

Fig.5

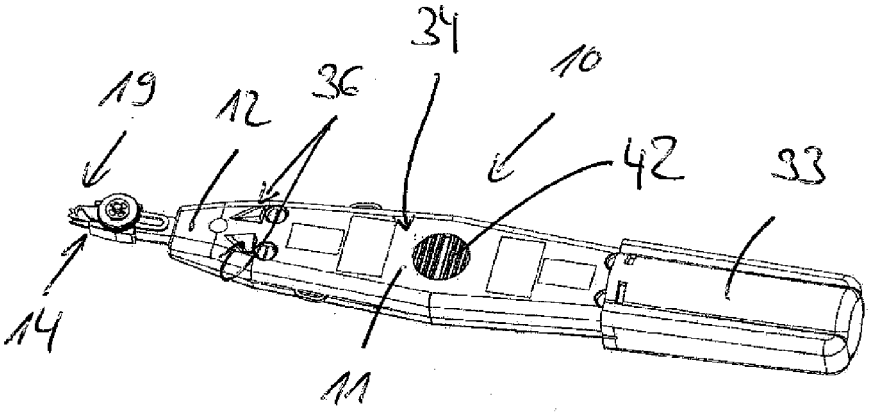

Fig.6

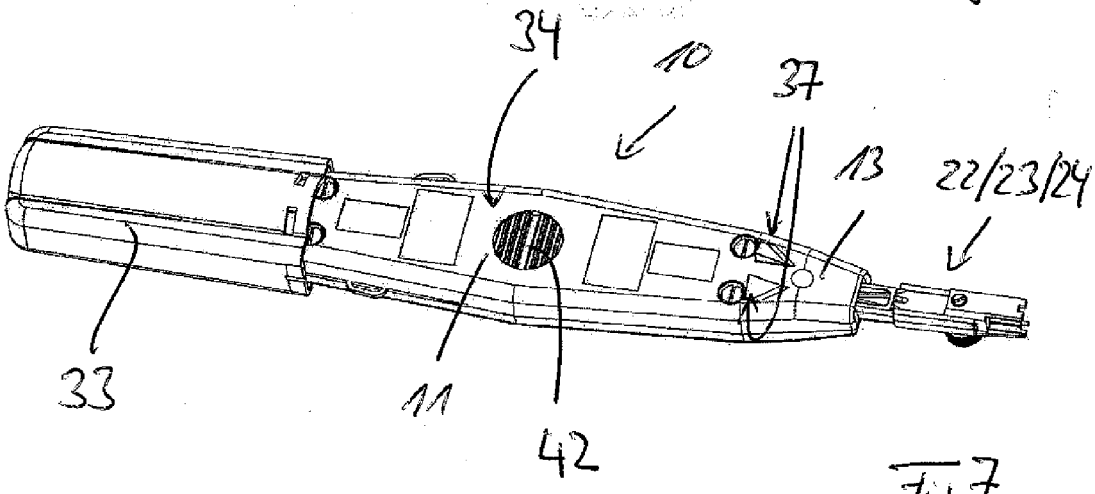

Fig.7

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EUROPEAN SEARCH REPORT

Application Number
EP 12 15 1082

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 Y	US 4 241 496 A (GREGSON DONALD L [US]) 30 December 1980 (1980-12-30) * column 2 - column 5; figures 1,2 *	1,5 2-4,6-13	INV. H01R43/01
A	US 2006/032345 A1 (CRAWLEY TIMOTHY M [US]) 16 February 2006 (2006-02-16) * figures 10-13 * * paragraphs [0048] - [0049] *	1-13	
A	US 3 883 316 A (MASON JOHN R) 13 May 1975 (1975-05-13) * figures 1-6 *	1	
A	GB 2 177 952 A (SIEMON CO SIEMON CO [US]) 4 February 1987 (1987-02-04) * figures 1-5 *	1	
A	US 4 920 637 A (MEYERHOEFER CARL [US] ET AL) 1 May 1990 (1990-05-01) * figures 1,2 *	1	
A	EP 0 040 307 A1 (KRONE GMBH [DE]) 25 November 1981 (1981-11-25) * figure 1 *	1	TECHNICAL FIELDS SEARCHED (IPC) H01R
Y	DE 28 40 912 A1 (SIEMENS AG) 17 April 1980 (1980-04-17) * figures 2-3 * * page 11, lines 6-8 * * page 10, lines 6-9 *	6,7, 10-13	
Y	US 4 306 349 A (KNICKERBOCKER ROBERT H) 22 December 1981 (1981-12-22) * figures 1-6 *	2-4,8,9	
A	GB 2 139 925 A (SIEMON CO) 21 November 1984 (1984-11-21) * figures 1-6 *	1	
	-/--		

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 June 2012	Hugueny, Bertrand

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EUROPEAN SEARCH REPORT

Application Number
EP 12 15 1082

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	"Accessories for Copper Communication Networks", , 31 December 2000 (2000-12-31), XP55029193, Retrieved from the Internet: URL:http://www.gnet.co.rs/corning/kupfer_carrier_katalog_en.pdf [retrieved on 2012-06-07] * page 71 * -----	1	
A,D	"ComProtect 2/1 CP ASU2410 A1, Installation Instructions", , 1 February 2005 (2005-02-01), XP55029196, Retrieved from the Internet: URL:http://www.te.com/commerce/DocumentDelivery/DDEController?Action=showdoc&DocId=Specification+Or+Standard%7F1316090%7FA%7Fpdf%7FEnglish%7FENG_SS_1316090_A.pdf%7F1316090 [retrieved on 2012-06-07] * page 5 * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 June 2012	Hugueny, Bertrand

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D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

1 EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 15 1082

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08-06-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4241496 A	30-12-1980	NONE	
US 2006032345 A1	16-02-2006	NONE	
US 3883316 A	13-05-1975	NONE	
GB 2177952 A	04-02-1987	CA 1257077 A1	11-07-1989
		DE 3623258 A1	15-01-1987
		FR 2584875 A1	16-01-1987
		GB 2177952 A	04-02-1987
		JP 62019385 A	28-01-1987
		US 4656725 A	14-04-1987
US 4920637 A	01-05-1990	NONE	
EP 0040307 A1	25-11-1981	AR 224819 A1	15-01-1982
		AU 547489 B2	24-10-1985
		AU 7082881 A	26-11-1981
		CA 1176041 A1	16-10-1984
		DE 8013494 U1	21-08-1980
		EP 0040307 A1	25-11-1981
		GB 2075903 A	25-11-1981
		HK 52986 A	18-07-1986
		JP 1275872 C	31-07-1985
		JP 56163884 A	16-12-1981
		JP 60000189 B	07-01-1985
		MY 8500463 A	31-12-1985
		US 4434542 A	06-03-1984
DE 2840912 A1	17-04-1980	NONE	
US 4306349 A	22-12-1981	NONE	
GB 2139925 A	21-11-1984	CA 1183333 A1	05-03-1985
		DE 3203751 A1	19-08-1982
		FR 2520941 A1	05-08-1983
		GB 2092485 A	18-08-1982
		GB 2139925 A	21-11-1984
		JP 57168876 A	18-10-1982
		US 4408391 A	11-10-1983

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Non-patent literature cited in the description

- Accessories for Copper Communication Networks. Corning Cable Systems. 2000, 71 **[0002]**
- ComProtect 2/1 CP ASU2410 A1, Installation Instructions. *ADC Telecommunications,* 2005, 5 **[0003]**