COMMONWEALTH of AUSTRALIA 602739

**PATENTS ACT 1952**

APPLICATION FOR A STANDARD PATENT

I
We KRONE AKTIENGESELLSCHAFT
Of Beeskowdamm 3-11,
D-1000 Berlin 37,
Federal Republic of Germany.

hereby apply for the grant of a Standard Patent for an invention entitled:

"DEVICE FOR CONNECTING CABLE WIRES TO CUTTING/CLAMPING CONTACTS OF DROPWIRE CONNECTOR BANKS OF TELECOMMUNICATION SYSTEMS"

which is described in the accompanying ~~provisional~~ complete specification.

Details of basic application(s):—

| Number | Convention Country | Date |
|---|---|---|
| P 36 41 367.4-34 | FEDERAL REPUBLIC OF GERMANY | 3rd December 1986 |
| P 36 41 366.6-34 | FEDERAL REPUBLIC OF GERMANY | 3rd December 1986 |

APPLICATION ACCEPTED AND AMENDMENTS ALLOWED 30-7-90

LODGED AT SUB-OFFICE
2 DEC 1987
Melbourne

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

Dated this 2nd day of December 19 87

To: THE COMMISSIONER OF PATENTS

K. A. Rimington
(a member of the firm of DAVIES & COLLISON for and on behalf of the Applicant).

Davies & Collison, Melbourne and Canberra.

# COMMONWEALTH OF AUSTRALIA

## PATENTS ACT 1952

## DECLARATION IN SUPPORT OF CONVENTION OR NON-CONVENTION APPLICATION FOR A PATENT

Insert title of invention.

In support of the Application made for a patent for an invention entitled: "Device for connecting cable wires to cutting/clamping contacts of dropwire connector banks of telecommunication systems"

Insert full name(s) and address(es) of declarant(s) being the applicant(s) or person(s) authorized to sign on behalf of an applicant company.

We Ralf Huth Dr. Josef Spieler
Of Krone Aktiengesellschaft
Of Beeskowdamm 3-11,
D-1000 Berlin 37,
Federal Republic of Germany.

do solemnly and sincerely declare as follows :-

Cross out whichever of paragraphs 1(a) or 1(b) does not apply

1(a) relates to application made by individual(s)
1(b) relates to application made by company; insert name of applicant company.

1. (a) ~~I am~~ We are ~~the applicant for the patent~~

or (b) I am authorized by

KRONE AKTIENGESELLSCHAFT

the applicant..... for the patent to make this declaration on ~~my~~ its behalf.

Cross out whichever of paragraphs 2(a) or 2(b) does not apply

2(a) relates to application made by inventor(s)
2(b) relates to application made by company(s) or person(s) who are not inventor(s); insert full name(s) and address(es) of inventor.

2. (a) ~~I am~~ We are ~~the actual inventor~~

or (b) Dieter GERKE Of Allmendeweg 107, 1000 Berlin 27, and
Lutz BIEDERSTEDT Of Breisgauerstr. 35, 1000 Berlin 38 and
Eberhard KLAIBER Of Hauptstr. 134, 1000 Berlin 62, all of Federal Republic of Germany.

~~I~~ are the actual inventor.....S..... of the invention and the facts upon which the applicant..... ~~I am~~ is ~~not~~ entitled to make the application are as follows :-

State manner in which applicant(s) derive title from inventor(s)

whereby the applicant would if a patent were granted on an application made by the said inventors be entitled to have the patent assigned to it.

Cross out paragraphs 3 and 4 for non-convention applications. For convention applications, insert basic country(s) followed by date(s) and basic applicant(s).

3. The basic application....S..... as defined by Section 141 of the Act ~~was~~ were made
in Federal Republic of Germany on the 3rd December 1986
by Krone Aktiengesellschaft (2)
in ..... on the .....
by .....
in ..... on the .....
by .....

4. The basic application....S... referred to in paragraph 3 of this Declaration ~~was~~ were the first application.....S... made in a Convention country in respect of the invention the subject of the application.

Insert place and date of signature.

Declared at Berlin this 16. day of December 1987

Signature of declarant(s) (no attestation required)

KRONE Aktiengesellschaft
Executive Secretaries: Ralf Huth / Dr. Josef Spieler

Note: Initial all alterations.

DAVIES & COLLISON, MELBOURNE and CANBERRA.

(12) PATENT ABRIDGMENT (11) Document No. AU-B-81998/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 602739

(54) Title
DROPWIRE CONNECTOR DEVICE

International Patent Classification(s)
(51)[4] H01R 043/01 H01R 004/24

(21) Application No. : 81998/87 (22) Application Date : 02.12.87

(30) Priority Data

| (31) Number | (32) Date | (33) Country |
|---|---|---|
| 3641366 | 03.12.86 | DE FEDERAL REPUBLIC OF GERMANY |
| 3641367 | 03.12.86 | DE FEDERAL REPUBLIC OF GERMANY |

(43) Publication Date : 09.06.88

(44) Publication Date of Accepted Application : 25.10.90

(71) Applicant(s)
KRONE AKTIENGESELLSCHAFT

(72) Inventor(s)
DIETER GERKE; LUTZ BIEDERSTEDT; EBERHARD KLAIBER

(74) Attorney or Agent
DAVIES & COLLISON, 1 Little Collins Street, MELBOURNE VIC 3000

(56) Prior Art Documents
US 4822300
EP 270480

(57) Claim

1. Apparatus for connecting a cable conductor to a cutting-fastening contact mounted in a chamber of a line-connecting block, for use in communications, said apparatus comprising a pressing-in tool, said tool having a guide portion and a pressing-in portion respectively adapted in shape to the form of the chamber and the cutting-fastening contact, and a driving face, said driving face being connected directly with said guide portion and said pressing-in portion and adapted to be applied with a force to press said pressing-in tool into said block.

COMMONWEALTH OF AUSTRALIA

PATENT ACT 1952

602739

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

CLASS INT. CLASS

Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

---

NAME OF APPLICANT: KRONE AKTIENGESELLSCHAFT

This document contains the amendments made under Section 49 and is correct for printing

ADDRESS OF APPLICANT: Beeskowdamm 3-11,
D-1000 Berlin 37,
Federal Republic of Germany.

NAME(S) OF INVENTOR(S) Dieter GERKE
Lutz BIEDERSTEDT
Eberhard KLAIBER

ADDRESS FOR SERVICE: **DAVIES & COLLISON**, Patent Attorneys
1 Little Collins Street, Melbourne, 3000.

**COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:**

"DEVICE FOR CONNECTING CABLE WIRES TO CUTTING/CLAMPING CONTACTS OF DROPWIRE CONNECTOR BANKS OF TELECOMMUNICATION SYSTEMS"

**The following statement is a full description of this invention, including the best method of performing it known to** us :-

# Device for connecting cable wires to cutting/clamping contacts of dropwire connector banks of telecommunication systems

The invention relates to a device for connecting cable conductors to cutting/~~clamping~~ fastening contacts of ~~dropwire connector banks of~~ line-connecting blocks in ~~tele~~communication systems.

From DE-PS 35 22 131, a press-in tool of said species is known. It consists of a shaft with a handle section as actuating face on one end and with guide and press-in pieces on the other end for pressing-in the cable wires into the cutting/~~clamping~~ fastening (alternatively referred to as cutting/clamping) contacts of the dropwire connector bank. For dropwire cable wires having thick insulation jackets causing, thus, high press-in forces when pressing-in the dropwire cable wires into the cutting/clamping contacts of the dropwire connector bank, a pre-cutting device is arranged at the shaft of the press-in tool, said pre-cutting device consisting of a U-shaped tool and of two curved cutting knives disposed at the inner sides of its two side faces. Prior to be pressed-in into the cutting/clamping contacts, the dropwire cable wires are cut by means of the curved cutting knives at two opposed positions in the intended contacting area, and only after said cutting process, they are inserted into the respective cutting/clamping contacts of the dropwire connector bank. Pressing-in is achieved, then, by means of the press-in pieces being adapted to the shape of the cutting/clamping contact. When using said known press-in tool for dropwire cable wires, two operation steps are required, in order to reduce the high press-in forces. Furthermore, the known press-in tool is expensive in design and, thus, in manufacture.

The dropwire connector banks mentioned above are known from DE-GM 8121 721. Hereby, the spacings of the clamping ribs are designed to meet the thick insulation jackets of the dropwire cables. Therefore, the clamping ribs cannot hold safely thin cable wires being pressed-in by means of the press-in tool into the cutting/clamping contacts of the dropwire connector bank. It has proven, thus, that the thin cable wires can be loosened from the cutting/clamping contacts of the dropwire connector bank due to vibrations acting on the dropwire connector banks, as the relatively thin insulation jacket of the thin cable wires are not held safely by the clamping ribs of the dropwire connector bank.

The present invention is based on the object of providing a technically simple device by use of which cable conductors can be connected to cutting-fastening contacts arranged in a line-connecting block in a single operation step.

Embodiments of the invention further allow thin cable conductors to be fixed with improved security.

In accordance with the invention there is provided apparatus for connecting a cable conductor to a cutting-fastening contact mounted in a chamber of a line-connecting block, for use in communications, said apparatus comprising a pressing-in tool, said tool having a guide portion and a pressing-in portion respectively adapted in shape to the form of the chamber and the cutting-fastening contact, and a driving face, said driving face being connected directly with said guide portion and said pressing-in portion and adapted to be applied with a force to press said pressing-in tool into said block.

A pressing-in tool according to embodiments of the invention can be a simple and economic component, in particular of plastic, allowing the connection of dropwire cable wires with the cutting/clamping contacts of a dropwire connector

bank in one single operation step and securing further the fixation of thin cable wires in dropwire connector banks. When using the pressing-in tool for connecting dropwire cable wires to dropwire connector banks, the high press-in forces existing due to the thick insulation jackets of the dropwire cables are overcome by easily applicable striking or lever forces being exerted on the application body being immediately adjacent to the guide and press-in portion of the pressing-in, or press-in, tool.

In particularly preferred manner, the press-in tool exhibits on its driving face a guide groove for the lever tool, in particular a screwdriver. The tip of the screwdriver can engage under for instance a support edge of support means associated with the dropwire connector bank said edge extending in a small distance above the switch side of the dropwire connector bank and transversely with respect to the guide groove of the press-in tool. By a lever motion of the screwdriver, the press-in tool is pressed-in into the connector bank, whereby, simultaneously, in one single operation step the dropwire cable wire is inserted into the cutting/clamping contact. After pressing-in the press-in tool into the dropwire connector bank, the upper side of the press-in tool is disposed below the support edge of the support means. In spite of the small height of the press-in tool, the high press-in forces can be overcome, said press-in forces arising when wiring dropwire connector banks with dropwire cable wires with the particularly thick insulation jacket.

The press-in tool may consist in particular of an economically mouldable, impact-resistant plastic. Thus, at each dropwire connector bank, a press-in tool can permanently be present by fastening it by means of a cord or the like to the dropwire connector bank.

A press-in tool of embodiments of the invention can also

serve as a closing plug for holding thin cable wires in dropwire connector banks. By using a press-in tool of plastic forming a closing plug according to claim 5, thin cable wires can be pressed-in into the cutting/clamping contacts of dropwire connector banks and can, on the other hand, be held safely in the dropwire connector banks, as the press-in tool remains as closing plug in the dropwire connector bank. As accommodation sections for the thin cable wires, holding ribs are provided on the underside of the press-in portions of the press-in tool. In particularly preferred manner, the press-in portions of the press-in tool are formed, however, by two snap-in half-shells connected by a film hinge, on the inner side of said half-shells one groove-type insertion channel each being provided for accommodation of the thin cable wire. The thin cable wire is inserted into the two fold-out half-shells, and when folding back, it is fixed between the half-shells. After

pressing-in the thus constructed press-in tool into the dropwire connector bank, the thin cable wire is fixed safely.

A particularly important advantage of the press-in tool forming a closing plug according to an embodiment of the invention is that the thin cable wire is centered by the press-in tool when inserted into the dropwire connector bank, such that a safe contact connection between the thin cable wire and the cutting/clamping contact of the dropwire connector bank is secured. It is particularly advantageous, too, that the thin cable wire is also pulled out, when the closing plug is pulled out.

In the following, embodiments of the invention are described in more detail, by way of example only, based on an embodiment shown in the drawings of a device for connecting cable wires to dropwire connector banks and based on several press-in tools applicable in connection with said device.

There are:

Fig. 1 a perspective view of the device of a dropwire connector bank with inserted press-in tool,

Fig. 2 a side view of the device,

Fig. 3 a perspective representation of the press-in tool in a first embodiment,

Fig. 4 a view of the underside of the press-in tool formed as closing plug in the second embodiment, and

Fig. 5 a view of the press-in tool formed as closing plug in a third embodiment with opened-up half shells.

The device according to Fig. 1 serves for connecting cable

wires 8, 29 to cutting/clamping contacts of dropwire connector banks 2 of telecommunication systems. The cable wires 8 form so-called dropwire cable wires together with an insulation jacket being relatively thick as compared to the wire cross section. The cable wires 29 are so-called thin cable wires, which are intended to be connected to dropwire connector banks 2 provided for dropwire cable wires 8.

The device comprises a support plate 1 with a connector bank 2 fixed on it by means of screw or snap-in connections, a press-in tool 3, 20, 21 and a lever tool in form of a screwdriver 4. The support plate 1 of metal material or a high-strength plastic comprises a base plate 5, on which the dropwire connector bank is mounted, and a rear wall 6 adjacent to one side of the dropwire connector bank 2, the longitudinal side of said rear wall 6 extending upward being bent in U-shaped manner for forming a support edge 7 extending along the longitudinal axis of the dropwire connector bank 2 above its switch side.

The dropwire connector bank 2 shown in Fig. 1 comprises ten slot chambers 18 arranged in a row, in said slot chambers 18 not-shown cutting/clamping contacts being arranged. Each slot chamber 18 is provided on the front of the dropwire connector bank 2 with a V-shaped clamping slot 17, the sides of which are formed by clamping ribs 17 provided with oblique clamping faces.

In the slot chambers 18 of the connector bank 2, cutting/clamping contacts are arranged, said cutting/clamping contacts being not shown in more detail and being known from DE 34 15 369, and to which dropwire cable wires 8 with particularly thick insulation jacket or thin cable wires 29 are intended to be connected. For pressing-in the cable wires 8, 29 into the cutting/clamping contacts, the press-in tool 3 shown in Fig. 3 is provided. It consists of guide and press-in pieces 9, 10 adapted to the shape of the cutting/clamping contacts and to the slot chambers 18, and an

application body 11 being immediately adjacent above, in particular for a striking or lever tool, in particular for a screwdriver 4. The outer shape of the press-in and guide pieces 9, 10 corresponds to the inner shape of the slot chambers 18 provided in the dropwire connector bank 2, in the slot chambers 18 cutting/clamping contacts being arranged. In particular, a slot 12 is provided between the press-in pieces 10, into which engages the cutting/clamping contact when pressing-in the cable wire 8, 29. The application body 11 exhibits on two opposed front faces several handle grooves 13 assisting in pulling-out the press-in tool 3 from the connector bank 2 by hand or serving for pressing-in the press-in tool 20, 21 when connecting thin cable wires 29. Laterally to the application body 11, a through-hole 14 is arranged for fastening the press-in tool 3 by means of a cord 15 or the like to the dropwire connector bank 2.

On the upper side of the application body 11, a guide groove 16 for the lever tool in form of a screwdriver 4 is provided.

For connecting a dropwire cable wire 8 to a cutting/clamping contact of the dropwire connector bank 2, the dropwire cable wire 8 is placed above the clamping slot 17 of a slot chamber 18 with associated cuttting/clamping contact. The press-in tool 3 is brought into the slot chamber 18 of the clamping slot 17. Now, the dropwire cable wire 8 is ready to be pressed-in into the slot chamber 18 above the clamping slot 17. The screwdriver is inserted as lever tool according to Fig. 2 with its shaft into the guide groove 16 of the press-in tool 3, whereby the screwdriver 4 rests with its tip on the support edge 7 of the support plate 1. With the screwdriver 4 acting as lever, the dropwire cable wire 8 is, thus, pressed through the slot chamber 18 into the clamping slot 17 of the cutting/clamping contact of the connector bank 2 in one single operation step. Subsequently, the press-in tool 3 is pulled out again by hand, in order to be used for connecting another dropwire cable wire 8.

The spacing of the clamping rib 19 of a clamping slot 17 of the dropwire connector bank 2 is designed for holding dropwire cables 8 being provided with a relatively thick insulation jacket around the the cable wire. For connecting the thin cable wires 29 to such a dropwire connector bank 2, the press-in tool 3 is designed as closing plug 20, 21 of plastic.

The underside of such a closing plug 20 is shown in more detail in Fig. 4 in the second embodiment of the press-in tool according to Fig. 3. The closing plug 20 comprises the guide piece 9 for engaging into the T-shaped slot chamber 18 of the dropwire connector bank 2 and two press-in pieces 10, between which the slot 12 for accommodation of the cutting/clamping contact not shown in more detail is recessed when pressing-in the closing plug 20 into the slot chamber 18 of the connector bank 2. The closing plug 20 is provided on the underside of its press-in pieces 10 with an accommodation section for a thin cable wire 29, the accommodation section being formed by holding ribs 28, between which the thin cable wire 29 is pressed-in when wiring, such that the thin cable wire 29 is centered when pressing-in the closing plug 20 into the slot chamber 18 of the dropwire connector bank 2. For wiring with a thin cable wire 29, the closing plug 20 can be pressed-in by hand into the slot chamber 18 of the dropwire connector bank 2 and remains in the chamber 18.

Fig. 5 shows the third embodiment of the press-in tool 3 shown in Fig. 3 and being here formed as closing plug 21. In this closing plug 21, the two press-in pieces 30 enclosing the slot 12 for the cutting/clamping contact are formed by two half-shells 32 connected by a film hinge 31, one half-shell 32 being rigidly connected with the guide piece 9. On the inner sides of the half-shells 32, one groove-type insertion channel 33 each for accommodation of the thin cable wire 29 is provided. The thin cable wire 29 is placed with opened-up half-shells 32 into a groove of the insertion channel 33, and is fixed after closing the half-shells 32 in

the insertion channel 33. When closing the half-shells 32, notches 34 and latches 35 provided on them engage with each other for locking. Then, the closing plug 21 is pressed-in into the desired chamber 18 of the dropwire connector bank 2, the thin cable wire 29 being safely contacted by the cutting/clamping contact, as when pressing-in , centering by means of the closing plug 21 is effected. The closing plug 21 insertable by hand remains in the dropwire connector bank 2. When pulling the closing plug 21 out from the dropwire connector bank 2, simultaneously the thin cable wire 29 is pulled out.

The reference numerals in the following claims do not in any way limit the scope of the respective claims.

## List of references

1 support plate
2 dropwire connector bank
3 press-in tool
4 screwdriver
5 base plate
6 rear wall
7 support edge
8 cable wire (thick dropwire cable wire)
9 guide piece
10 press-in piece
11 application body
12 slot
13 handle groove
14 through-hole
15 cord
16 guide groove
17 clamping slot
18 chamber
19 clamping rib
20 closing plug
21 closing plug
22 press-in piece
23 press-in piece
28 holding rib
29 cable wire (thin)
30 press-in rib
31 film hinge
32 half-shell
33 insertion channel
34 notch
35 latch

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Apparatus for connecting a cable conductor to a cutting-fastening contact mounted in a chamber of a line-connecting block, for use in communications, said apparatus comprising a pressing-in tool, said tool having a guide portion and a pressing-in portion respectively adapted in shape to the form of the chamber and the cutting-fastening contact, and a driving face, said driving face being connected directly with said guide portion and said pressing-in portion and adapted to be applied with a force to press said pressing-in tool into said block.

2. Apparatus according to claim 1,
characterised in that the driving face is provided with a guide groove for application of a lever tool, and that there is associated with the line-connecting block, support means having a support edge for supporting the lever tool in applying leverage to said pressing-in tool.

3. Apparatus according to either one of claims 1 or 2,
characterised in that the pressing-in tool exhibits a through-hole for connecting the pressing-in tool with the line-connecting block by means of a cord or the like.

4. Apparatus according to any one of claims 1 to 3,
characterised in that the pressing-in tool is made of impact-resistant plastic.

5. Apparatus according to any one of claims 1 to 4,
characterised in that the pressing-in tool is adapted for connecting a thin cable conductor to the cutting-fastening contacts of the line-connecting block by being formed as a closing plug, being insertable into a chamber and being provided with accommodation means for said thin cable conductor.

6. Apparatus according to claim 5, characterised in that as accommodation means for the thin cable conductor, holding ribs are provided on the underside of the pressing-in portion of the closing plug.

7. Apparatus according to claim 5, characterised in that the pressing-in portion of the closing plug is formed by two snap-in half-shells connected by a film hinge, on the inner side of said half-shells one groove-type insertion channel each being provided, forming the accommodation means for the thin cable conductor.

8. Apparatus according to any one of the preceding claims wherein said guide portion comprises a web.

9. Apparatus according to any one of the preceding claims wherein said pressing-in portion comprises a web.

10. A device for connecting cable wires to cutting-fastening contacts substantially as hereinbefore described with reference to the drawings.

DATED this 23rd day of July, 1990.

KRONE AKTIENGESELLSCHAFT
By its Patent Attorneys
DAVIES & COLLISON

FIG.1

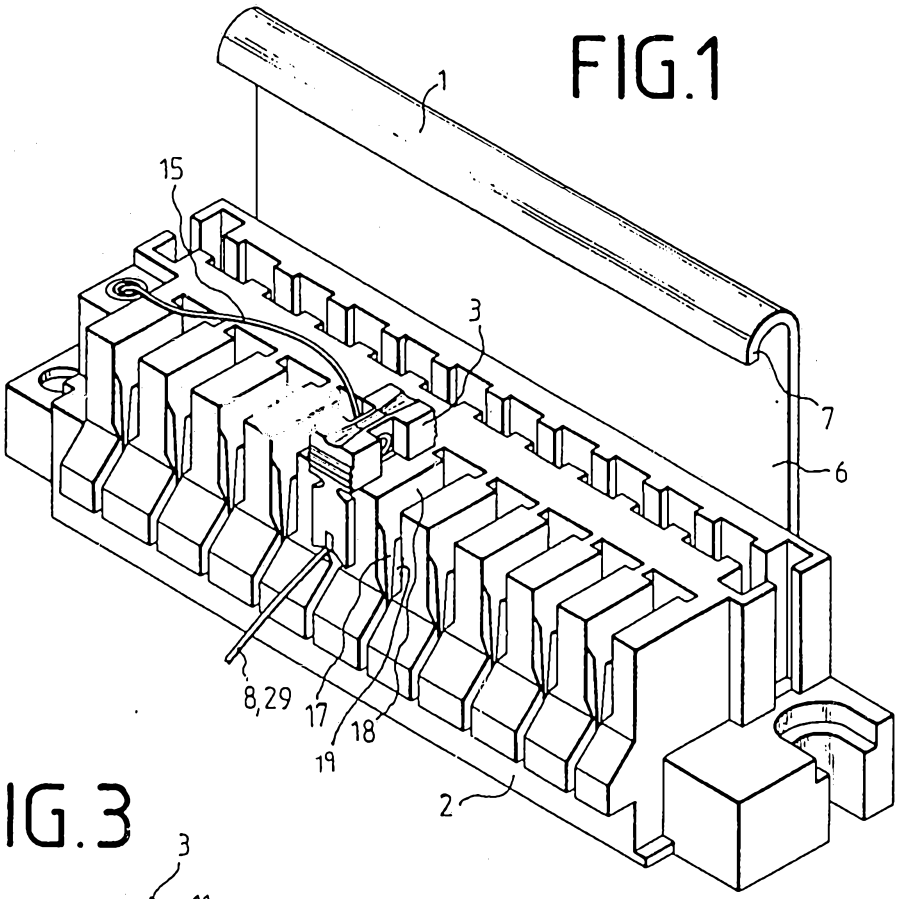



FIG.3

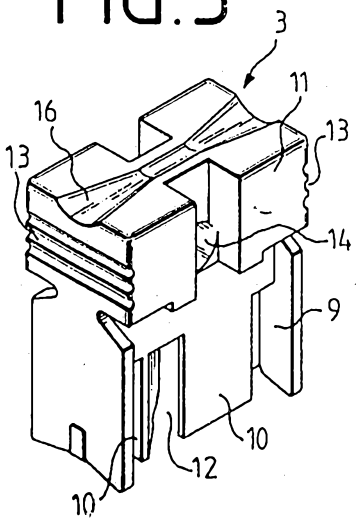
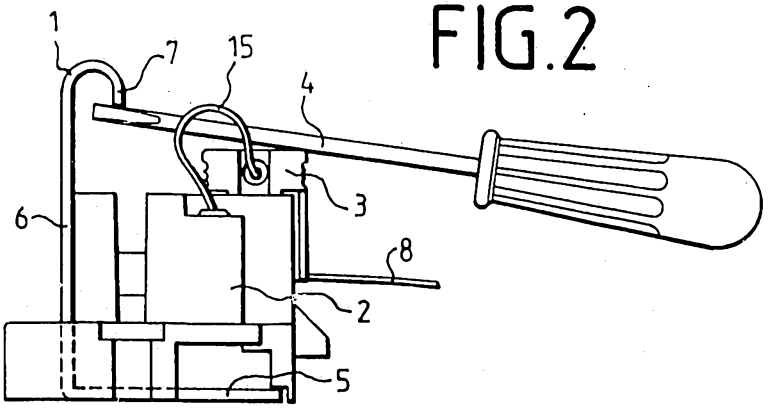



FIG.2



81 998/87

FIG.4

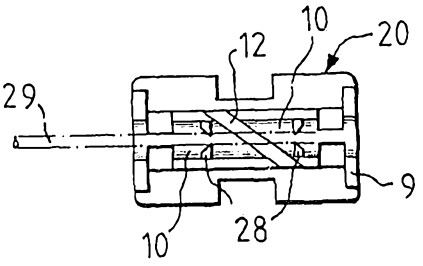



FIG.5