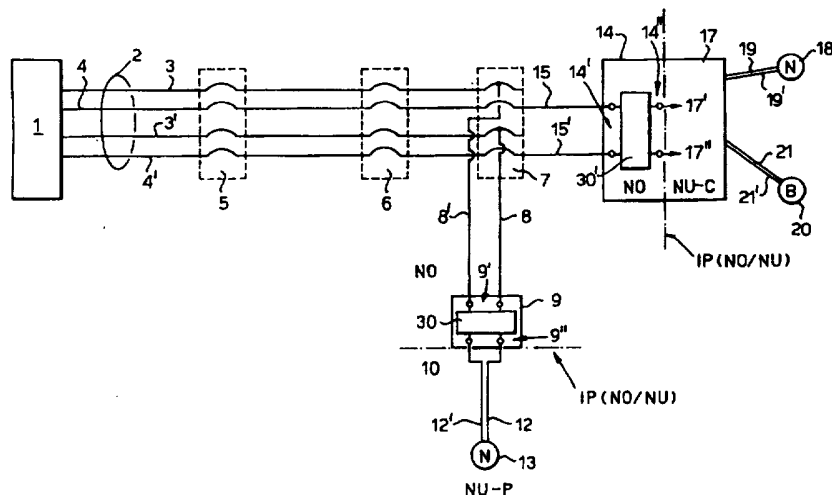




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**(54) Title:** METHOD AND DEVICE FOR NETWORK TERMINATION**(57) Abstract**

A method and device for providing a juncture between the network owner side (NO) and the network user side (NU) which defines a measurable interface in a telecommunications network for telephony and data, wherein the juncture is formed by a terminal block (14). Between the incoming side (14') and the outgoing side (14'') of the terminal block there is provided for at least one set of wire pairs (8, 8', 12, 12', 15, 15', 17, 17'') an electronic component (30, 30'), e.g., an integrated circuit. The terminal block is provided with a seal (49; 50), wherein the sealing is preferably carried out by placing a potting compound on the terminal block (14), so that the potting compound at least partly envelops the positioned component (30; 30') and optionally surrounds a lower portion of the contacts (23, 23', 39) in the block (14).

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**METHOD AND DEVICE FOR NETWORK TERMINATION**

The present application relates to a method and a device for providing a juncture  
5 between the network owner side and the network user side in a telecommunications  
network for telephony and data, as is disclosed in the preambles of attached claims 1 to  
4 and 9 to 12.

Today it is customary to connect the network owner cable to a terminal block and allow  
10 the network user cable to extend from one of the output terminals thereof. Such  
terminal blocks have contacts where certain parts thereof are susceptible to corrosion  
and deterioration, which in some cases can result in galvanic breaks and loss of signal  
connection, or that the resistance in the cable connection increases. It has therefore long  
been a great wish, not least on the part of network owners to be able to avoid these  
15 problems.

Furthermore, it is known that the high ohmic resistor termination of the network owner  
cable is often made at the first user apparatus located on the network user's premises.  
This is especially so in connection with installation in private homes.

20

This means that it is relatively easy to operate fraudulent traffic on telephone lines in  
that the person doing this connects himself to the network owner's connection boxes at  
some point on the line network, preferably relatively close to the network owner's  
property. In practice, this means that it is relatively difficult automatically to discover  
25 such manipulation or fraudulent traffic, and the network user who is ignorant of this  
fraudulent traffic receives surprising and, for him, incomprehensible bills for services  
used.

As the technique has developed and the tendency towards this type of fraudulent traffic  
30 has grown, especially in connection with extended telecommunications services, the  
number of complaints concerning incomprehensible "units" and suspicions of fraudulent  
traffic have increased considerably.

For the network owners this is a major problem, since investigations are both time-  
35 consuming and complicated, and also because it is not always easy to discover where  
the fraudulent connection has been made on the telecommunications cable.

Discussions are constantly arising with regard to who is really responsible for the fraudulent traffic on the telecommunications cable, and the network user is often a losing party.

- 5 An objective of the present invention is therefore to provide in a simple manner a method and a device of the type mentioned by way of introduction, and where the said problems are resolved in an extremely simple manner by in reality providing a well-defined interface (area of responsibility) between network owner and network user, whether the network user is a private customer or a corporate customer.

10

The method and the device are characterised as set forth in the attached patent claims.

The invention shall now be described in more detail with reference to the attached drawings, wherein:

15

Fig. 1 is a schematic illustration of a typical telecommunications network between a central exchange and subscribers;

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Fig. 2 shows a typical terminal block wherein the device according to the invention is incorporated;

Fig. 3 is an enlarged cross-section of a terminal block made in accordance with the principles of the present invention;

- 25 Fig. 4 is a schematic illustration of a modification of the telecommunications network as shown in Fig. 1;

Fig. 5 is a skeleton diagram of a possible electronic component which forms a part of the terminal block according to the invention;

30

Fig. 6 is an enlarged cross-section of a modified terminal block wherein the electronic component is fixed;

Fig. 7 shows an alternative embodiment of an interface;

35

Fig. 8 shows wiring for an interface as shown in fig. 7;

Fig. 9 shows the section IX-IX in Fig. 7.

Fig. 1 illustrates a central exchange 1 wherein, as an example, there is shown exiting the exchange 1 a cable 2 consisting of two pairs of wires 3, 3' and 4, 4'. In the illustrated example, these wire pairs are passed through connection boxes 5 and 6 before branching takes place in another connection box 7. The wire pair 3, 3' branches off from the box 7 with the aid of a further wire pair 8, 8', and is fed into the inlet 9' on a network owner terminal block 9, wherein the outlet 9'' forms interface IP (NO/NU) for a private customer NU-P. The wire pair 8, 8'' terminates on the side 9' of the interface 9 by means of a high ohmic resistor 10. Connections 11 and 11' between the input side 9' and the output side 9'' symbolise in reality the many connection possibilities that are present in a terminal block, i.e., fixed, permanent connection, connection via an isolating switch or via a switching component, e.g., a fuse or an electronic component, e.g., an integrated circuit. Outgoing side 9'' forms further connection via a wire pair 12, 12' by mean of a normal attachment N, indicated by the reference numeral 13, e.g., a telephone set.

From the wire pair 4, 4' a branch is led to a terminal block 14 with the aid of a wire pair 15, 15'. The wire pair 15, 15' is terminated on the input side 14' of the terminal block 14. The output side 14'' of the terminal block functions as an interface between network owner NO and network user NU, and where, in the chosen example, the network user is a corporate customer NU-C. The wire pair 15, 15' is terminated on the output side 14'' of the terminal block by means of a high ohmic resistor 16. There is a connection from the wire pair 15, 15' over to the network user side 17 by means of connections 17, 17' for further connection to, for instance, an ordinary telecommunications connection user apparatus N indicated by means of the reference numeral 18, the connection between the user side 17 (e.g., a private exchange) and the user apparatus 18, e.g., a telephone set, being provided by means of wire pair 19, 19'. If the user side 17 is, e.g., a network user exchange, subsidiary apparatuses B can be connected by means of wire pair 21, 21'.

Although wire connections are shown consisting of typical wire pairs, it will immediately be appreciated that it is conceivable to use cable connections containing more than two wires to each network user, i.e., that the connection to the network owner side of a terminal block likewise may have several wires or wire pairs per course in use.

Fig. 1 shall thus merely serve to elucidate the inventive idea without in any way being deemed limiting therefor.

Furthermore, it will be understood that in addition to the resistors 10, 16, other  
5 electronic or electric components may optionally be connected, depending on the need in question, or be replaced by electronic components, e.g., integrated circuit.

Fig. 2 is a lateral view of a typical terminal block, here for the sake of simplicity, designated by means of the reference numeral 22. The terminal block in Fig. 2 is seen  
10 from the output side. The terminal block consists of a box part 22' and a lid part 22'', the lid part being capable of being guided down over the box part 22' and being snapped into place there or secured in another manner. The terminal block is provided with knife-contacts 23 and 23' for each length of wire as is seen more clearly from Fig. 3. In the example in Fig. 3 the knife-contacts 23 and 23' merge at the bottom into respective  
15 jumper elements 24 and 24'. The type of terminal block which is shown in Fig. 3 is a typical "cut-off block", e.g., manufactured by Krone AS, Oslo, Norway, under the name LSA-PLUS®.

The jumper parts 24, 24' cause the two knife-contacts 23 and 23' to be in galvanic  
20 contact with each other, and the jumper parts 24, 24' thus represent, e.g., the connection 11 in Fig. 1.

The jumper contacts 24, 24' may optionally be forced apart by means of a cut-off pin (not shown) which can be inserted through an aperture 25 in the cover 22'. If the  
25 jumper parts 24 and 24' are spaced apart, the block 22 is called an "isolating block". If the parts 24 and 24' optionally consist of a single part, which means to say that the knives 23 and 23' are also a single unit, the block is called a "connector block". Such further variants are known per se to the skilled person and are marketed *inter alia* by Krone AS, Oslo, Norway.

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The hatched area in Fig. 3 designated 26 is normally intended for fixing to retaining bars or the like.

As shown in Fig. 2, two wire pairs, e.g., on the terminal block 22, for instance, the wire  
35 pairs 1A, B and 2A, B are terminated in a resistor, respectively 27 and 28. If there is little space available in the block box 22', the resistors 27, 28 may optionally be so-called surface-mounted devices (SMD). A considerable depth of the box-shaped part

22' of the block 22 is filled with a potting compound 29, e.g., an epoxy which fills a substantial part of the available space in the box 22', in particular the lower part of the knife-contacts 23, 23' being covered by this potting compound, in addition to a part of the contact part 24, 24' being covered at the bottom. Moreover, as shown in Fig. 3 and  
5 indicated by means of the hatching in Fig. 2, the resistor 27 (and 28) is also covered by this potting compound 29. Firstly, this provides the advantage that the block 22 has electric and/or electronic components which, because of the potting, are protected against external stress, such as condensation, damp, vibrations, dust, dirt or contaminants, but not least important is that such components cannot be removed, e.g.,  
10 the component 27 (and optionally 28).

As shown and described in connection with Figs. 1 to 3, the components 10, 16 as shown in Fig. 1, or the components 27, 28 as indicated in Fig. 2 and in part in Fig. 3, may be either an electric component, e.g., a high-ohmic resistor or an electronic  
15 component, e.g., an integrated circuit. However, a combination of an electric and electronic circuit is also conceivable.

However, if there is a desire to use an electronic circuit with a switch function encapsulated in the terminal block, it will be necessary to modify the method and the  
20 device according to the present invention, as is shown in more detail in Figs. 4 to 6. In this case, the electronic component, here indicated by respectively the reference numeral 30 for use in the block is intended for the private user, and that indicated by reference numeral 30' for use in the block 9 is intended for private user NU-P, and that indicated by reference numeral 30' for use in the block 14 is intended for corporate customer NU-  
25 C.

The electronic component 30, 30', e.g., an integrated circuit, is located between incoming side 9';14' and outgoing side 9''; 14'' on respectively the terminal block 9 and 14 for at least one set of wire pairs 8; 15 and 8'; 15' and associated wire pairs on  
30 the output side 12; 17' and 12'; 17''. In the integrated circuit 30; 30' there may be a detector 31 which typically has terminal pairs A, B, C and D. The terminal pair A may typically provide current to the detector 31, as there will normally be a DC-voltage of 48 Volts on the line 8; 15 and 8'; 15' from the network owner's exchange 1. Terminal B of the detector will typically be for receiving an actuating signal from the network  
35 owner's telephone exchange 1. Terminal C will typically be an output terminal for transmission of a signal to the telephone exchange 1. Terminal D will be an inlet which is typically adapted for receiving a signal from the network user's telephone set.

Furthermore, in the integrated circuit there is incorporated an electronic switch function, symbolised by the switches SW1 and SW2 which are both shown in a closed position and by means of the broken line in an open position. Furthermore, a terminating resistor RT, preferably a high ohmic resistor, is included in the integrated circuit. This resistor is connected between the wires in the wire pair 8; 15 and 8'; 15', respectively  
5 between the wires in the wire pair 12; 17' and 12'; 17'' via the switches SW1 and SW2. Naturally it should be understood that the illustrated switches are electronic switches.

When the detector 31 receives an actuating signal from the network user's telephone set  
10 via the wires 12; 17' and 12'; 17'' and the terminals 33, 33' of the electronic component in through inlet D of the detector, the detector will be actuated to transmit to the telephone exchange 1 of the network owner's side an optionally pre-coded dialling tone request signal via the wire pair 8; 15 and 8'; 15'. The exchange 1 will be adapted to transmit, on receiving such a request signal, a dialling tone back on said wire pair via  
15 the terminal block 9; 14 to the network user side of the terminal block. The actuating signal from the network user's telephone set may, e.g., be a signal which is emitted from the telephone set when the handset is lifted off the base of the set. This means that it will not be possible to go into the wire pair 8; 15 and 8'; 15' on the network owner side in order to operate fraudulent traffic on a telephone line there, as no dialling tone will be  
20 available on the line pair before the central exchange has put out a dialling tone on this line pair. If it is an objective to have best possible security in the system, the actuating signal from the network user's telephone set may optionally be a pre-coded signal which is capable of being detected by the detector 31. The dialling tone request signal which is transmitted from the detector 31 exits the detector via outlet B.

25

In the cases where the network user reports a fault on the telephone line, the normal practice will be that the telephone company comes out to check the telephone line by manually disconnecting the terminal block, so that the network user's equipment is not in the line network.

30

In certain cases this can be a laborious, time-consuming and therefore expensive operation, and with the solution shown in Figs. 4-6 it is envisaged that the electronic component, which is equipped with said line switch function via the switches SW1 and SW2, will be able to reduce significantly the work required in connection with line  
35 checking. On the receipt of a signal from the telephone exchange 1 on network owner's side via the inlet C, the detector 31 will selectively cause the switches SW1 and SW2 to operate in order to connect the network user side to or disconnect it from the network



owner side at the said interface IP (NO-NU). If the telephone company ascertains that the telecommunications line is not encumbered with a fault on the network owner side, the subscriber will immediately be notified that the fault has been checked and it has been ascertained that it lies on the network user side. The network owner can then offer

5 to repair the fault on the network user side, or the network user may ensure that the fault is repaired himself. The terminals of the integrated circuit on the network owner side are indicated by means of the reference numerals 32, 32' and on the network user side by means of 33, 33'. In order to be able to place the electronic component 30; 30' in the terminal block 22 it is proposed, according to the invention, to place the integrated

10 circuit between the knife-contacts of the terminal block 22, in Fig. 6 exemplified by the knife-contacts 23, 23' for, e.g., one of the wires 8; 15 and 12; 17 on one of the conductive courses in the wire pair. Thus, it will be natural to connect the integrated circuit to the opposing knife contact pair of the terminal block via connections 32, 32' on the network owner's side and 33, 33' on the network user's side. The integrated

15 circuit is preferably attached by soldering. Although this is not shown clearly on the drawing, a person versed in the art would immediately understand that it would be most expedient first to solder in place a holder for the integrated circuit, and then put the circuit in place in the holder. Once the integrated circuit is thus in galvanic connection with the knife-contacts of the terminal block, here exemplified by the contacts 23 and

20 23', at least a section of the lower part 22' of the block, is filled with a sealing material. Alternatively, it will be theoretically possible to allow the potting compound in the lower part 22' to constitute an integral part of the terminal block box, so that the potting compound at least surrounds a lower portion of the contact in the block, thereby completely enveloping any positioned component. The advantages of this potting

25 compound in the terminal block are described in more detail in connection with Fig. 3 and will not be repeated here.

Although the invention has a special application in connection with a telephone set on the user side, it will immediately be appreciated that the invention is as applicable for

30 use in connection with other telecommunications apparatus, e.g., fax machines, data transfer and so forth. Of course, the invention is also useful for transferring both analog and digital signals in an access network, e.g., a PSTN (Public Switched Telephone Network). The solution that is apparent from Figs. 1 to 6, with accompanying description, enables the network owner to test the telephone line up to the interface

35 between the network owner and the network user. Such testing of the network owner side of the telephone or telecommunications line 8; 15 and 8'; 15' could be carried out

without the network user having reported any fault, as this testing will be able to take place quickly and as a matter of routine.

Although here it is illustrated and described that the potting compound is preferably  
5 added to the box part of the terminal block as a after-sealing, it is nevertheless conceivable that by means of a suitable technique direct potting could take place in the body of the actual box 22'.

The potting also has the advantage that it provides effective protection of the curved  
10 portion at the bottom of the knife-contacts 23, 23' against typical corrosion.

In Fig. 7 an alternative embodiment of an interface is shown, where this can be mounted in a connection box. The cable from the central exchange is here indicated by means of the reference numeral 34. This may, e.g., consist of four wire pairs, of which only two  
15 are shown for the sake of simplicity, indicated by means of reference numerals 35, 36 and 37, 38. These wire pairs are shown connected to the input side 39 of the terminal block. The output side 40 of the block forms a connection with a cable 41 to the network user, and here is shown having only two wire pairs 42, 43 and 44, 45, although it is to be understood that that the cable 41 may have more wire pairs, e.g., four.

20

The jack socket for the network user's telecommunications equipment or for connection of the network owner's checking equipment is indicated by means of the reference numeral 46. This jack socket may be of a type that is known per se. Between the input side 39 of the block and said jack socket and output side 40 there is connected an  
25 electronic component 47, e.g., an integrated circuit. The circuit 47 may, e.g., be of the type that has been described in connection with Fig. 5.

Fig. 8 shows, although only as an example, a section of a conductive pattern for a printed circuit board 48 where the input side 39 and output side 40 of the block, the jack  
30 socket 46 and the component 47 can be mounted. To ensure that the component 47 cannot easily be removed, and at the same time preventing corrosion and any short-circuiting in the terminal block, it is preferred to provide the block with a seal 49 which wholly or partly covers the component 47 and optionally a lower portion of the contacts of the block on the input side 39 and the output side 40, and optionally also around the  
35 jack socket 46. With reference to Fig. 9, it will be understood that if soldering of the input side 39, the output side 40, the jack socket 46 and the component 47 takes place on the back of the circuit board, it may be sensible to provide also the back of the board

with a seal 50. If the board 48 is only designed for surface mounted components (SMD), the seal 50 may of course be forgone.

It will be understood that the component 47 will not necessarily make use of all the  
5 inlets, but that internal onward connections without electronic function are conceivable.

Once wires have been mounted in the block, it will be possible from the central exchange 1 via, e.g., wire pair 3, 3' to take measurements on the line to define its characteristic resistance value, whereby later it can easily be seen whether any  
10 fraudulent traffic or manipulation is being carried out on the telecommunications line. Such after-checking of the impedance of the telecommunications line may optionally take place automatically or in another regular fashion, so that any deterioration or manipulation of the cable exiting the exchange 1 is easily discovered. In this way, the network owner will have a good opportunity to repair any faults or act on attempts to  
15 swindle long before the customer notices anything, if at all. Any fraudulent traffic on the line of the user side will be of little significance to the impedance of the telecommunications line as it is seen from the network owner's exchange 1, whereas fraudulent traffic on the network owner side of the interface gives immediate and easily registrable change in the impedance.

20

If the interface is located inside the user's property, e.g., on a house wall or just inside a house wall, maximum security will be achieved.

It is also conceivable that the central exchange 1 has a memory for measured impedance  
25 values or is provided with a means which keeps continuous or intermittent contact with the interface, e.g., contact with the electronic circuit, or that it maintains contact with the electronic circuit, or that it maintains contact with a customer-specific contact or block. A customer-specific contact or block of this kind could, e.g., contain an electronic circuit which on receipt of an actuating signal from the exchange sends back an  
30 identification signal. The electronic circuit may optionally be adapted in such a way that if an attempt is made to operate fraudulent traffic on the line between the exchange and the interface, the exchange will register that an unidentified circuit is on the network. A circuit of this kind can, e.g., be coded with a secret code decided by the exchange when the line is established. A new circuit will not be given the same code  
35 and a code will only be established when the line is established by the telephone company's personnel.

In this way the network owner will be able to offer his customers maximum service and a secure network, thereby attaining the greater confidence of the customers.

5 An important point with respect to the present invention is that the network owner will be able to have total monitoring of his lines up to the interface with the user, as on the network user side of the interface there is in reality free competition and it is possible to operate with many different suppliers, even for one and the same customer.

Patent claims

1.
  - 5 A method for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture is provided in a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network user in the telecommunications network,
  - 10 characterised in that on said outgoing side of the terminal block there is provided at least between one set of wire pair contacts an electric component, e.g., a high ohmic resistor, and/or an electronic component, e.g., an integrated circuit, and/or that the terminal block is provided with a seal, wherein the sealing is preferably carried out by placing a potting compound in the box of the terminal block or allowing the potting compound to
  - 15 constitute an integral part of the box, so that the potting compound at least surrounds a lower portion of the contacts in the block and completely envelops any positioned component.
2.
  - 20 A method for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture is provided in a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network user in the telecommunications network,
  - 25 characterised in that between the incoming and outgoing side of the terminal block there is provided for at least one set of wire pairs an electronic component, e.g., an integrated circuit, and/or that the terminal block is provided with a seal, wherein the sealing is preferably carried out by placing a potting compound in the box of the terminal block or allowing the potting compound to constitute an integral part of the box, so that the
  - 30 potting compound at least surrounds a lower portion of the contacts in the block and completely envelops any positioned component.
3.
  - 35 A method for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture is provided in a terminal block, and where the outgoing side of the network owner part

of the terminal block defines an interface between the network owner and the network user in the telecommunications network,  
characterised in that on said outgoing side of the terminal block there is provided at least between one set of wire pair contacts an electric component, e.g., a high ohmic resistor,  
5 and/or an electronic component, e.g., an integrated circuit, and that the terminal block is provided with a seal in the form of a potting compound on the terminal block, so that the potting compound at least partly envelops the positioned component, and optionally surrounds a lower portion of the contacts in the block.

10 4.

A method for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture is provided in a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network  
15 user in the telecommunications network,  
characterised in that between the incoming and outgoing side of the terminal block there is provided for at least one set of wire pairs an electronic component, e.g., an integrated circuit, and that the terminal block is provided with a seal in the form of a potting compound on the terminal block, so that the potting compound at least partly envelops  
20 the positioned component, and optionally surrounds a lower portion of the contacts in the block.

5.

The method as disclosed in Claim 1, 2, 3 or 4, wherein the terminal block has at least  
25 two conductive courses, characterised in that some but not all of the sets of the conductive course are provided with said electric or electronic component.

6.

The method as disclosed in Claim 1, 2, 3, 4 or 5,  
30 characterised in that the electronic component is actuated on receipt of an actuating signal from the network user's apparatus, whereby an optionally pre-coded dialling tone request signal is transmitted from the component to the network owner side's exchange, and that the exchange, on receipt of the request signal, transmits a dialling tone to the network user side of the terminal block.

35

7.

A method as disclosed in Claim 1, 2, 3, 4, 5 or 6, characterised in that the electronic component is actuated on receipt of an actuating signal from the network owner side's exchange to connect the network user side to or disconnect it from the network owner side via a switch function in the component.

8.

A method as disclosed in one or more of Claims 1 to 7, characterised in that the sealed, optionally component-equipped, terminal block is brought into connection with the cable inlet for the network user's property.

9.

A device for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture consists of a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network user in the telecommunications network, characterised in that on said outgoing side of the terminal block there is provided at least between one set of wire pair contacts an electric component, e.g., a high ohmic resistor, and/or an electronic component, e.g., an integrated circuit, and/or that the terminal block is provided with a seal, wherein the sealing is preferably carried out by placing a potting compound in the box of the terminal block or allowing the potting compound to constitute an integral part of the box, so that the potting compound at least surrounds a lower portion of the contacts in the block and completely envelops any positioned component.

10.

A device for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture consists of a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network user in the telecommunications network, characterised in that between the incoming and outgoing side of the terminal block there is provided for at least one set of wire pairs an electronic component, e.g., an integrated circuit, and/or that the terminal block is provided with a seal, wherein the sealing is preferably carried out by placing a potting compound in the box of the terminal block or allowing the potting compound to constitute an integral part of the box, so that the

potting compound at least surrounds a lower portion of the contacts in the block and completely envelops any positioned component.

11.

- 5 A device for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture consists of a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network user in the telecommunications network,
- 10 characterised in that on said outgoing side of the terminal block there is provided at least between one set of wire pair contacts an electric component, e.g., a high ohmic resistor, and/or an electronic component, e.g., an integrated circuit, and that the terminal block is provided with a seal in the form of a potting compound on the terminal block, so that the potting compound at least partly envelops the positioned component, and optionally
- 15 surrounds a lower portion of the contacts in the block.

12..

- A device for providing a juncture between the network owner side and the network user side in a telecommunications network for telephony and data, wherein the juncture
- 20 consists of a terminal block, and where the outgoing side of the network owner part of the terminal block defines an interface between the network owner and the network user in the telecommunications network,
- characterised in that between the incoming and outgoing side of the terminal block there is provided for at least one set of wire pairs an electronic component, e.g., an integrated
- 25 circuit, and that the terminal block is provided with a seal in the form of a potting compound on the terminal block, so that the potting compound at least partly envelops the positioned component, and optionally surrounds a lower portion of the contacts in the block.

30 13.

The device as disclosed in one of Claims 9 to 12, wherein the terminal block has at least two sets of cable courses, characterised in that some, but not all, of the sets of the conductive part are provided with said electric or electronic component.



14.

The device as disclosed in one or more of Claims 9 to 13,  
characterised in that the electronic component is equipped with a detector which on  
receipt of an actuating signal from the network user's apparatus is actuated to transmit  
5 an optionally pre-coded dialling tone request signal to the network owner side's  
exchange, and that the exchange is adapted to transmit, on receipt of the request signal,  
a dialling tone to the network user side of the terminal block.

15.

10 A device as disclosed in one or more of Claims 9 to 14,  
characterised in that the electronic component is equipped with a line switch function  
which, on receipt of an actuating signal from the network owner side's exchange,  
selectively connects the network user side to or disconnects it from the network owner  
side at said interface.

15

16.

A device as disclosed in one or more of Claims 9 to 15,  
characterised in that the sealed, optionally component-equipped, terminal block is  
brought into connection with the cable inlet for the network user's property.

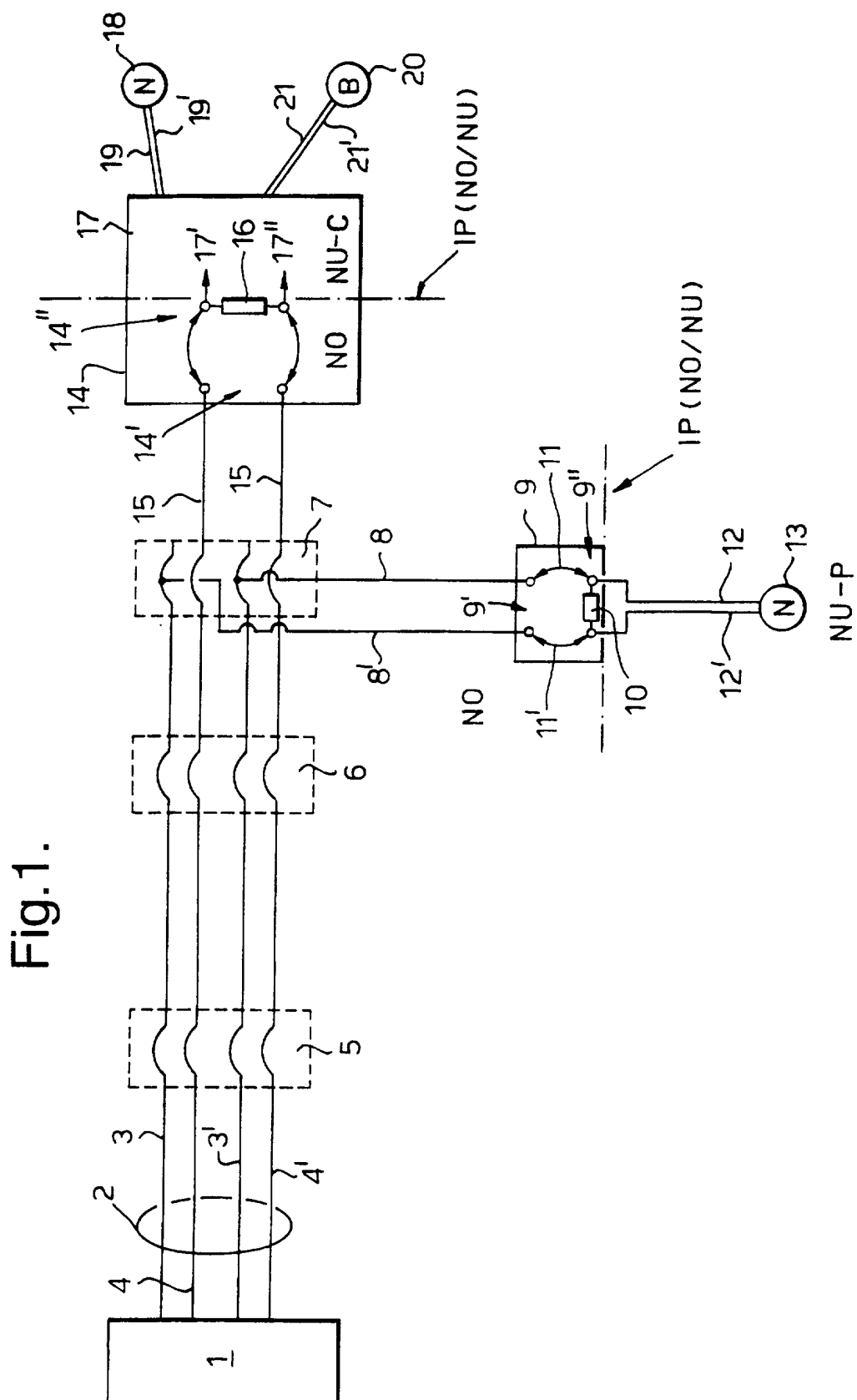
20

17.

A device as disclosed in one or more of Claims 9 to 16,  
characterised in that the contacts of the terminal block preferably are knife-contacts, and  
that the contacts in each conductive course, i.e., respectively on the cable side (in-side)  
25 of the block and on the distribution side (out-side), either are permanently connected or  
are separable, e.g., with the aid of a cut-off pin or are in contact with one another via an  
interconnecting component, e.g., a fuse or said electronic component.

18.

30 The device as disclosed in one or more of Claims 9 to 17,  
characterised in that the said potting compound is a curable plastic material.



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Fig.2.

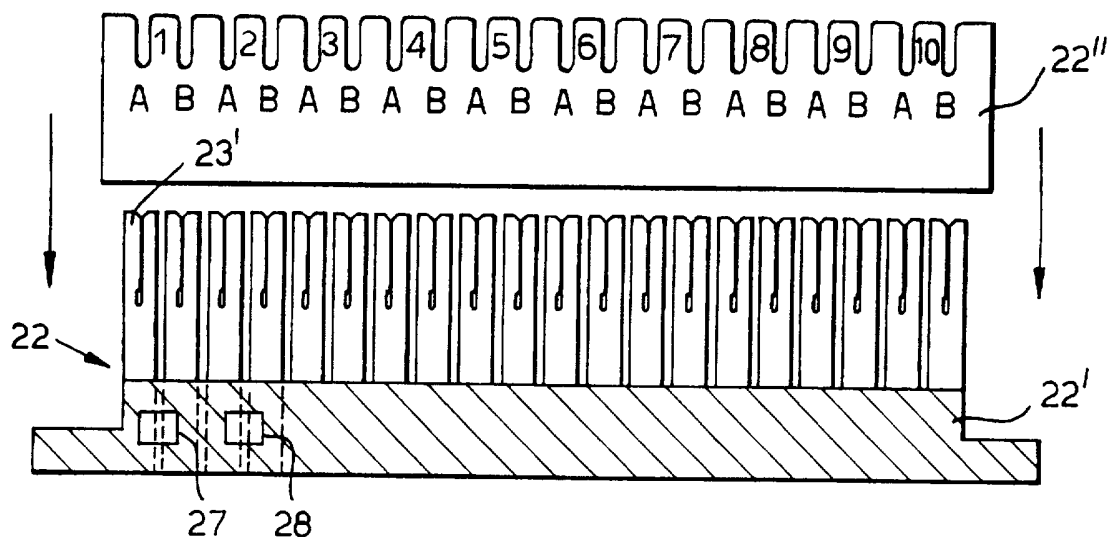
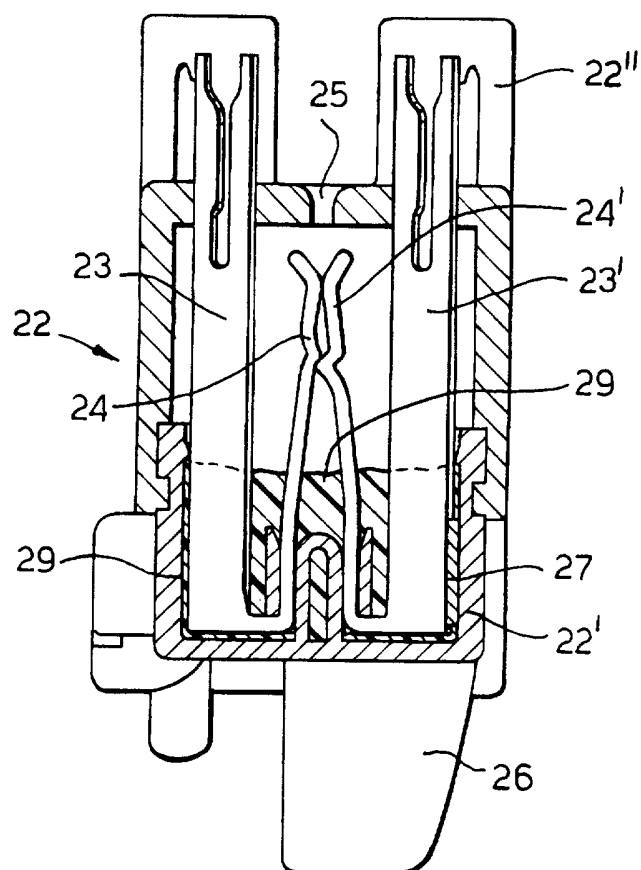
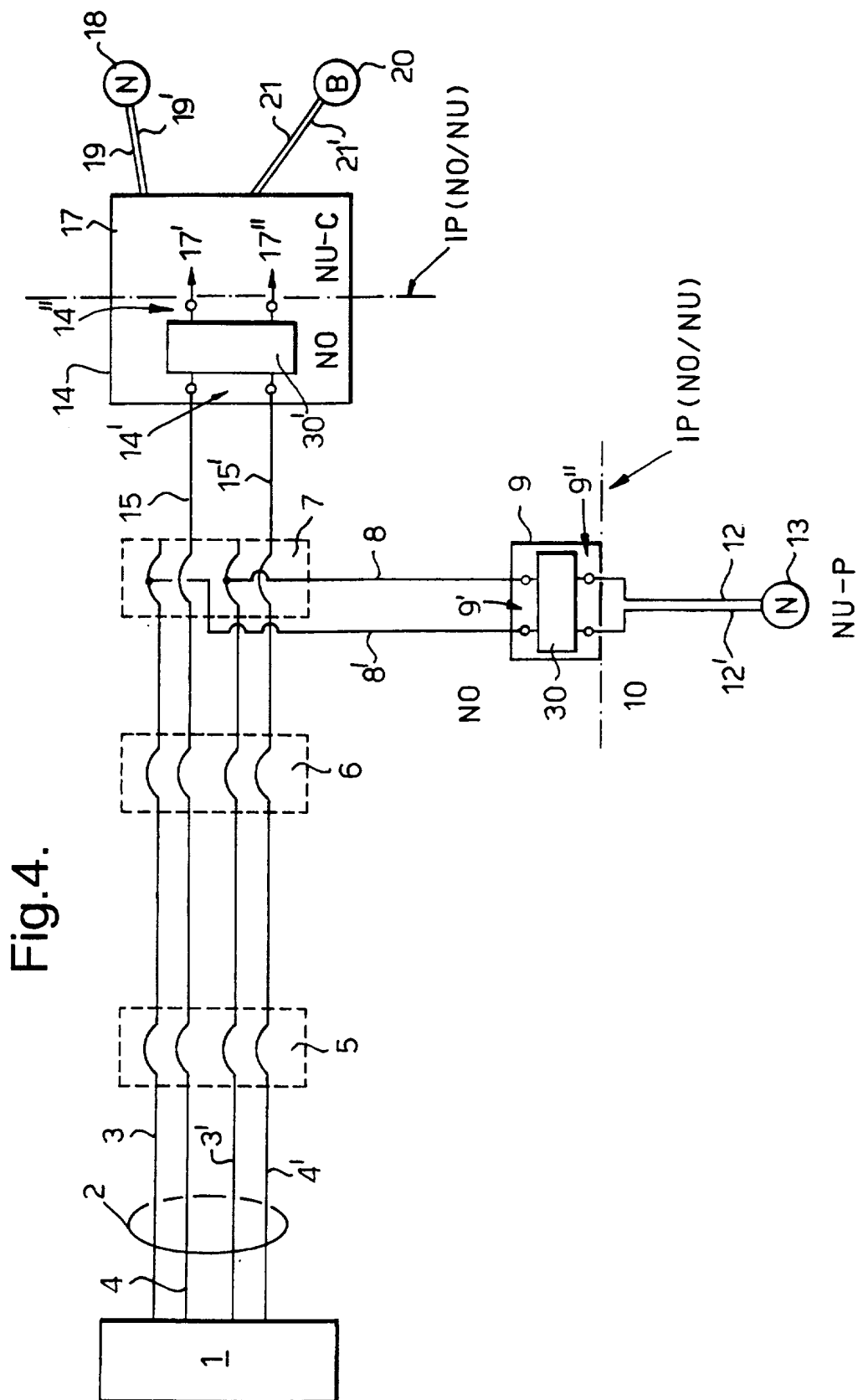


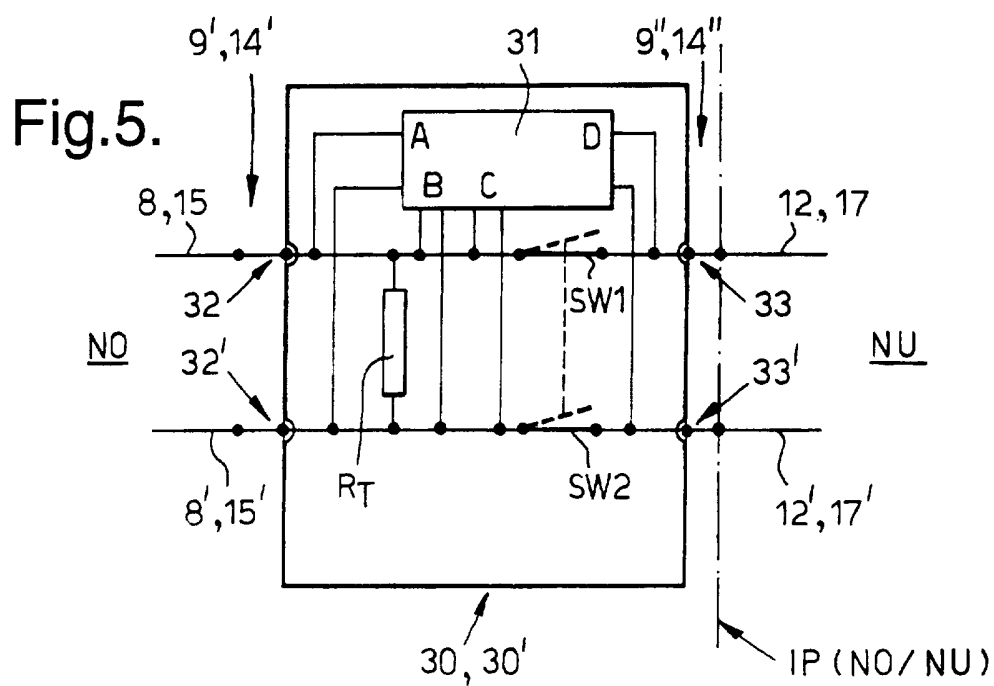
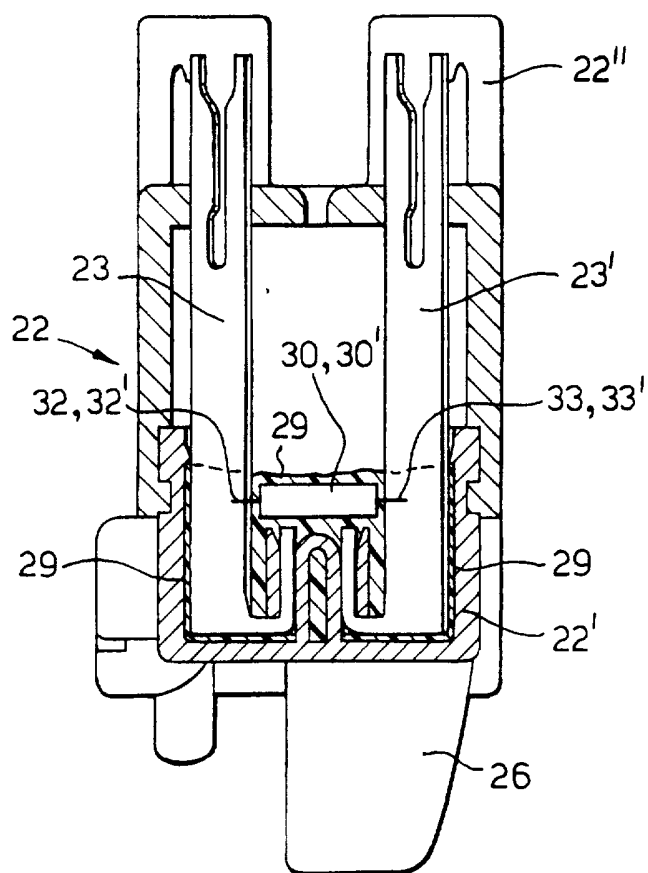
Fig.3.



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**Fig.6.**

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Fig.7.

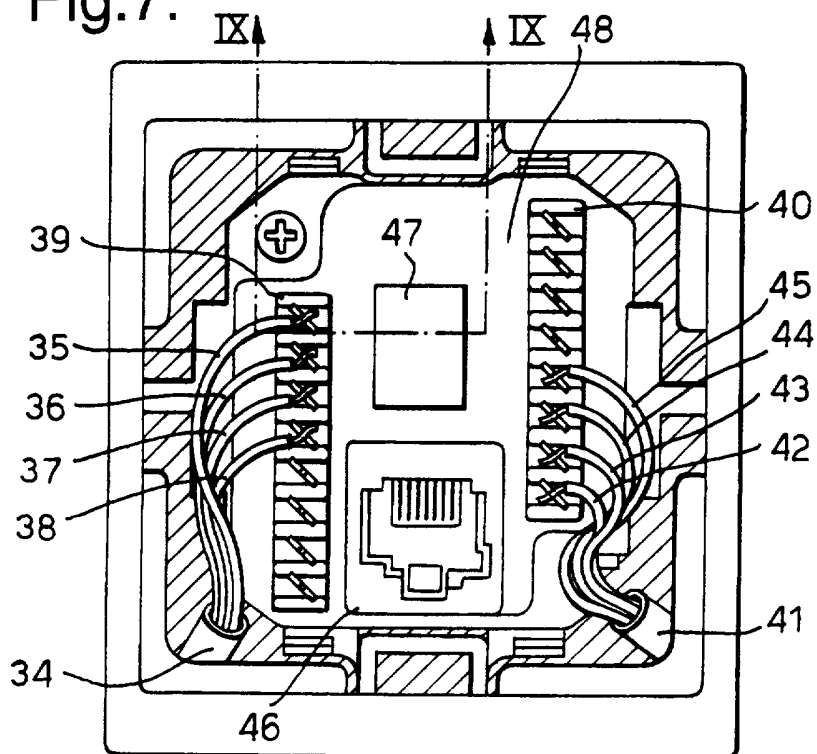


Fig.8.

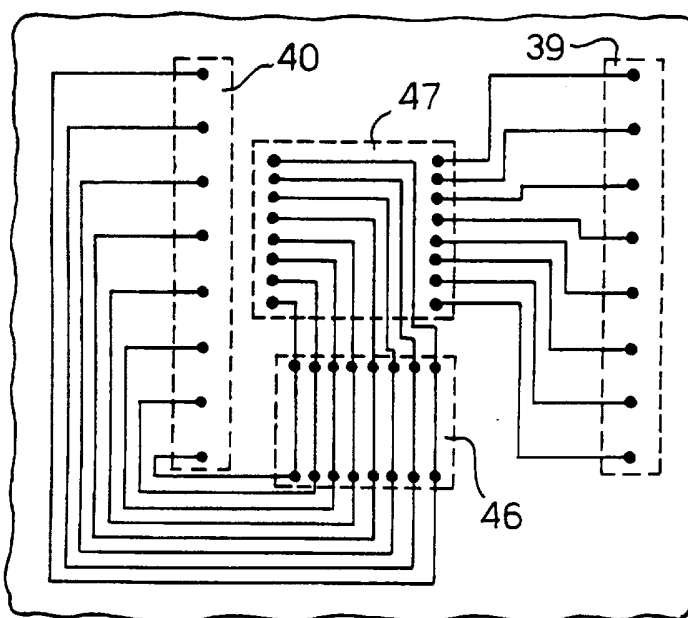
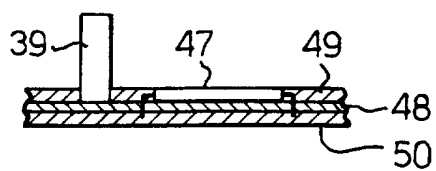


Fig.9.



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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 97/00003

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04M 1/24, H04M 1/66, H04M 1/02, H01R 13/66  
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)

IPC6: H04M, H04Q

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

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SE 469705 B (TELI AB), 23 August 1993 (23.08.93), page 4, line 12 - line 14, abstract --	1-5,8-13, 16-18
X	WO 9535617 A1 (VIEHMANN), 28 December 1995 (28.12.95), page 5, line 24 - page 6, line 7, figures 1-2, abstract --	1-6,8-14, 16-18
X	EP 0564063 A1 (GPT LIMITED), 6 October 1993 (06.10.93), figure 1, abstract --	1-5,7-13, 15-18
X	US 4764950 A (DICKEY ET AL), 16 August 1988 (16.08.88), column 2, line 13 - line 16, figures 1-17 --	8,18

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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"&amp;" document member of the same patent family

Date of the actual completion of the international search

15 April 1997

Date of mailing of the international search report

26 -04- 1997

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 97/00003

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	GB 2237912 A (MERCURY COMMUNICATIONS LIMITED), 15 May 1991 (15.05.91), figures 1-2, abstract  -- -----	1-18



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

PCT/NO 97/00003

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GB	2237912	A	15/05/91	NONE	