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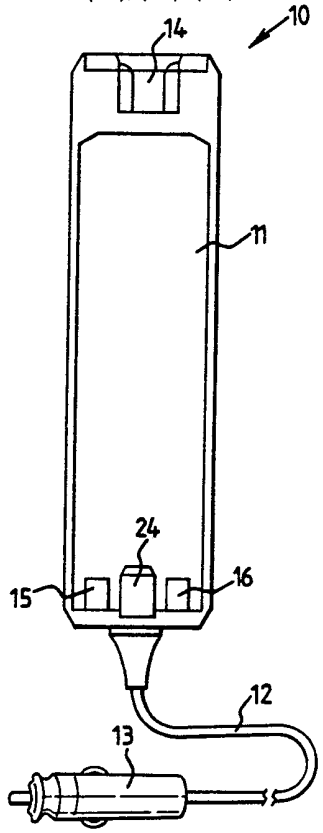
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(54) **Power supply for energising a portable telephone from a vehicle battery**

(57) The supply has a housing 11 which has a similar size and configuration to an external battery pack normally used with the phone so that the housing 11, with power output contacts 15, 16, can be plugged on to the phone in place of the battery pack. The supply circuit within the housing 11 is connected to the vehicle battery via a plug 13 to fit a cigarette lighter socket, and the circuit includes means for protection against wrong polarity connection (as with a positive earth vehicle) and a regulator to reduce the voltage to that required for the phone. The housing 11 also carries touch responsive power ON and OFF contacts (20), (21), (Fig 1) and LED's (17), (18), (19) to indicate power ON, OFF and LOW.

FIG.2



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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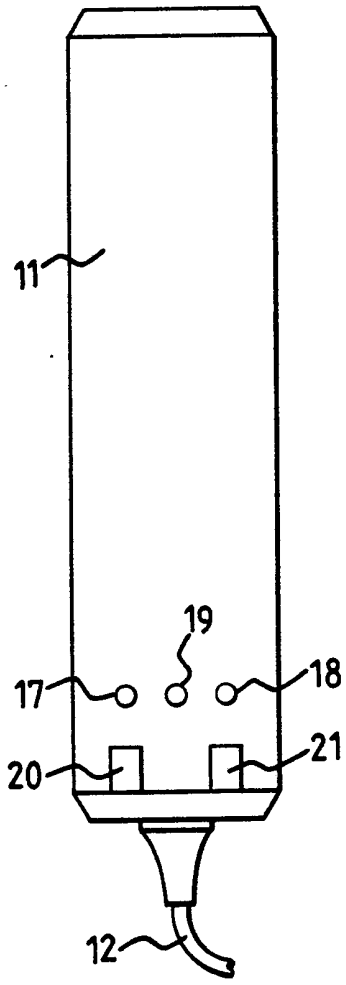


FIG.1

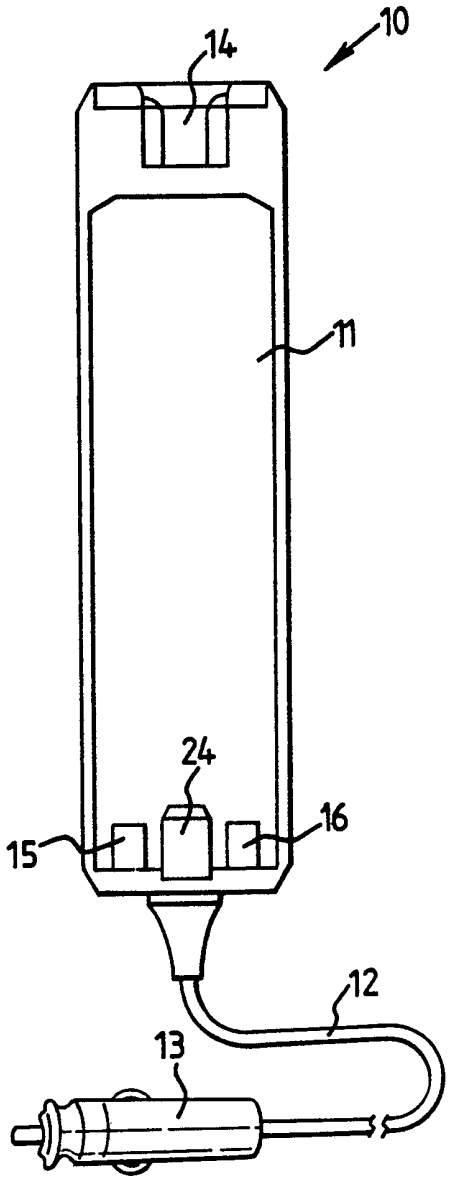


FIG.2

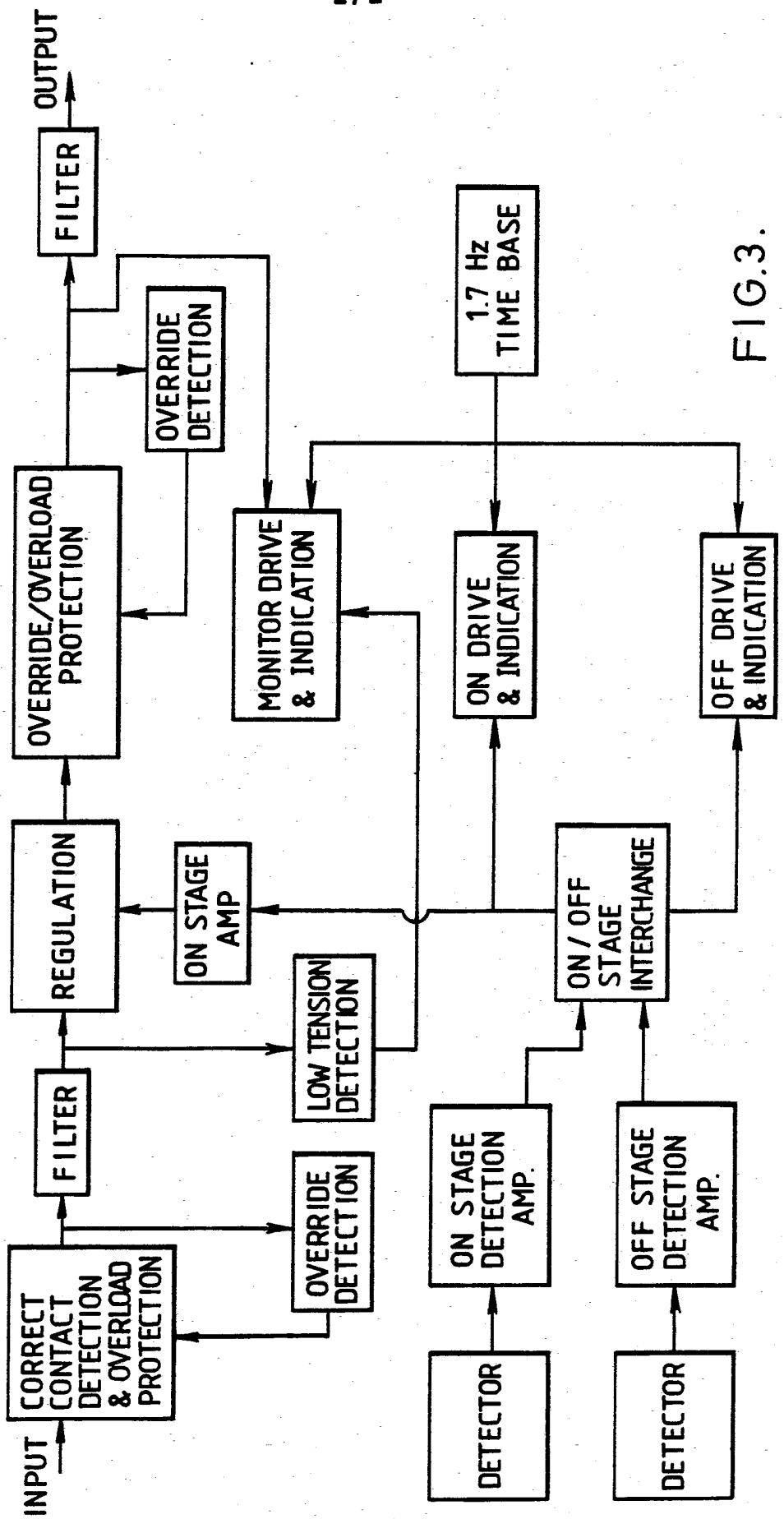

INPUT
CORRECT CONTACT DETECTION & OVERLOAD PROTECTION
FILTER
REGULATION
OVERRIDE/OVERLOAD PROTECTION
FILTER
OUTPUT
OVERRIDE DETECTION
OVERRIDE DETECTION
ON STAGE AMP
LOW TENSION DETECTION
MONITOR DRIVE & INDICATION
1.7 Hz TIME BASE
ON DRIVE & INDICATION
OFF DRIVE & INDICATION
ON / OFF STAGE INTERCHANGE
ON STAGE DETECTION AMP.
OFF STAGE DETECTION AMP.
DETECTOR
DETECTOR

FIG.3.

POWER CONNECTOR FOR A PORTABLE PHONE

This invention relates to a power connector for a portable or mobile phone.

Portable phones are now available which may be connected directly to the battery of a vehicle for extended operating life. This connection may be either a direct connection or an indirect connection via a rechargeable battery associated with the portable phone. With the indirect connection the vehicle battery recharges or keeps charged the phone's operating battery. This battery may be internally or externally mounted. For the direct connection method, no intermediate battery is used. The phone is powered directly by the vehicle's battery.

As the vehicle's battery is of a higher voltage then that required to operate the phone, voltage regulation is required. The direct connection method has an advantage over the indirect method in that the internal battery will become obsolete with time and require replacement while draining the vehicle battery more rapidly by the continuous recharging of the phone's battery.

Both types suffer from the disadvantageous that they do

not provide protection against reverse connection of the power supply, i.e. when using with positive earth vehicle. Nor do they provide an indication of low supply voltage nor any convenient method of isolating the power supply from the phone to conserve power.

The present invention provides a power connector for a portable phone comprising, a housing arranged to fit the portable phone and to supply electrical power to the phone, and a lead for connecting the housing to a source of electrical power, wherein the housing incorporates means for regulating the power supply and means for protecting the phone against incorrect connection to the power supply.

Preferably, the power connector include means for isolating the phone from the supply.

Preferably, the connector includes visual means for indicating that the supply has been isloated and means for indicating that the supply voltage is low.

One prefered form of the invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 is a front view of a connector according to the

present invention;

Figure 2 is a rear view of the embodiment of Figure 1; and

Figure 3 is block diagram showing the basic operational sequence of the power connector.

The prefered embodiment as shown in Figure 1 or 2 has a housing (11) to which is attached a supply lead or extension cord (12). The other end of the extension cord is connected to a power plug (13) designed to be inserted in the cigarette lighter of a vehicle.

The housing is shaped to be of a similar size and configuration to an external battery casing used with the type of portable phone to which the connector is to be used. On the inside or rear surface of the housing are a number of cut outs (14) and raised portions (24) designed to cooperate with fittings on the phone to act as detent means to support and hold the connector to the phone. A positive terminal (15) and a negative terminal (16) are aligned with positive and negative terminals on the portable phone to supply power thereto. On the front surface of the connector (10) are a series of LED indicators. LED (17) is a power "ON" indicator. LED (18) is a power "OFF" indicator and LED (19) is the power level monitor. Preferably, the power "ON" indicator will

be red, the power "OFF" indicator will be green and the power level monitor will be yellow. When the connector is in operation the red LED indicator (17) will indicate that the phone is in operational condition. The green LED indicator (19) shines to indicate that the phone has been isolated from the supply. The yellow LED indicator (18) shines to indicate that the power level is sufficient to ensure proper operation of the phone. When it goes out, proper operation of the phone cannot be guaranteed due to insufficient power.

Two touch switches (20 & 21) are located towards the bottom of the housing. Touch switch (20) is the "ON" switch and touch switch (21) is the "OFF" switch. When the "ON" switch is touched, power is supplied to the phone. When the "OFF" switch is touched, the phone is isolated from the power supply. This provides a quick and simple method of operating the phone and for isolating the phone from the power supply to both conserve power and to turn the phone off at times when it is not required, for example, when the vehicle is unattended or the occupant does not wish to be disturbed by the phone. The status of the connection is indicated by the indicators (17) or (18) as discussed previously.

From the block diagram Figure 3, it can be seen that the supply power, which labelled "INPUT" is first

interrogated to ensure correct connection or correct orientation of the power supply as well as providing overload protection. The interrogation is controlled by an override detection feedback circuit. The supply is filtered as it is passed to the regulation section. The output of the filter is also used for the low voltage detection circuit which is used to drive the power level monitor. The regulation section is used to regulate the supply to the portable phone as portable phones generally operated at a voltage less than that supplied by the battery of a vehicle. The regulation section is also used to isolate the supply from the phone when the connector is turned off. The output from the regulator is again passed through an override/overload protection circuit and through a final filter before being connected to the output terminals. The "ON" switch (21) turns on the ON stage detection amplifier which drives the ON/OFF stage interchange. The "OFF" switch detector similarly is connected to the ON/OFF stage interchange by the OFF stage detection amplifier used to control the regulator as well as driving the ON drive and OFF drive indication circuits. A 1.7 Hz time base is used by the ON, OFF and monitor drive and indication circuits.

CLAIMS

1. A power connector for a portable phone comprising a housing arranged to fit to the portable phone and to supply electrical power thereto, and a lead for connecting the housing to a source of electrical power, wherein the housing incorporates means for regulating the power supply and means for protecting the phone against incorrect connection to the power supply.

2. A power connector as defined in claim 1 wherein the connector comprises means for isolating the phone from the supply.

3. A power connector as defined in claim 2 wherein the isolating means includes a touch sensitive switch.

4. A connector as defined in claim 2 wherein the isolating means comprises two touch sensitive switches, one switch to isolate the supply and the other to establish the supply.

5. A power connector as defined in claims 2, 3 or 4 wherein the connector includes visual indicating means for indicating whether the supply is isolated or established.

6. A connector as defined in any one of the preceding claims wherein the connector includes visual indicating means for indicating that the voltage of the power supply is low.

7. A power connector for a portable phone substantially as hereinbefore described with reference to the accompanying drawings.

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