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**G4N NCLC N6P**

(56) Documents cited  
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(58) Field of search  
**UK CL (Edition J) G4N NCLC**  
**INT CL<sup>4</sup> G08B**

(54) **Detector for use in connection with a nappy**

(57) The detector comprises a sensor 16 adapted in use for location in or on the nappy, an indicator 17, and a driver circuit 19 for the indicator. The indicator is energised to provide a warning signal in response to the sensor detecting when the nappy gets wet. The sensor and indicator may be provided in separate units connected together by a radio link.

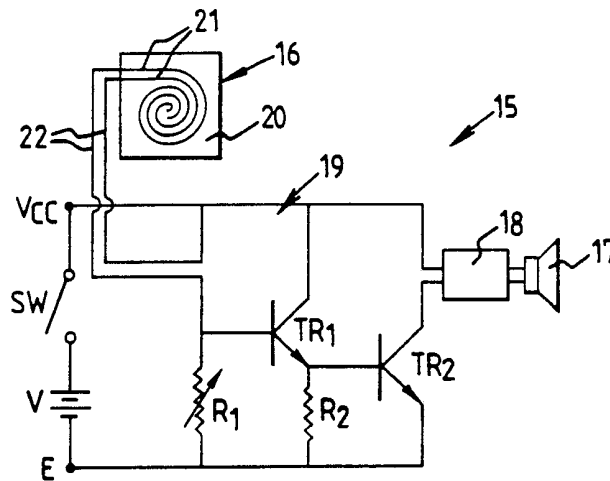


FIG.2.

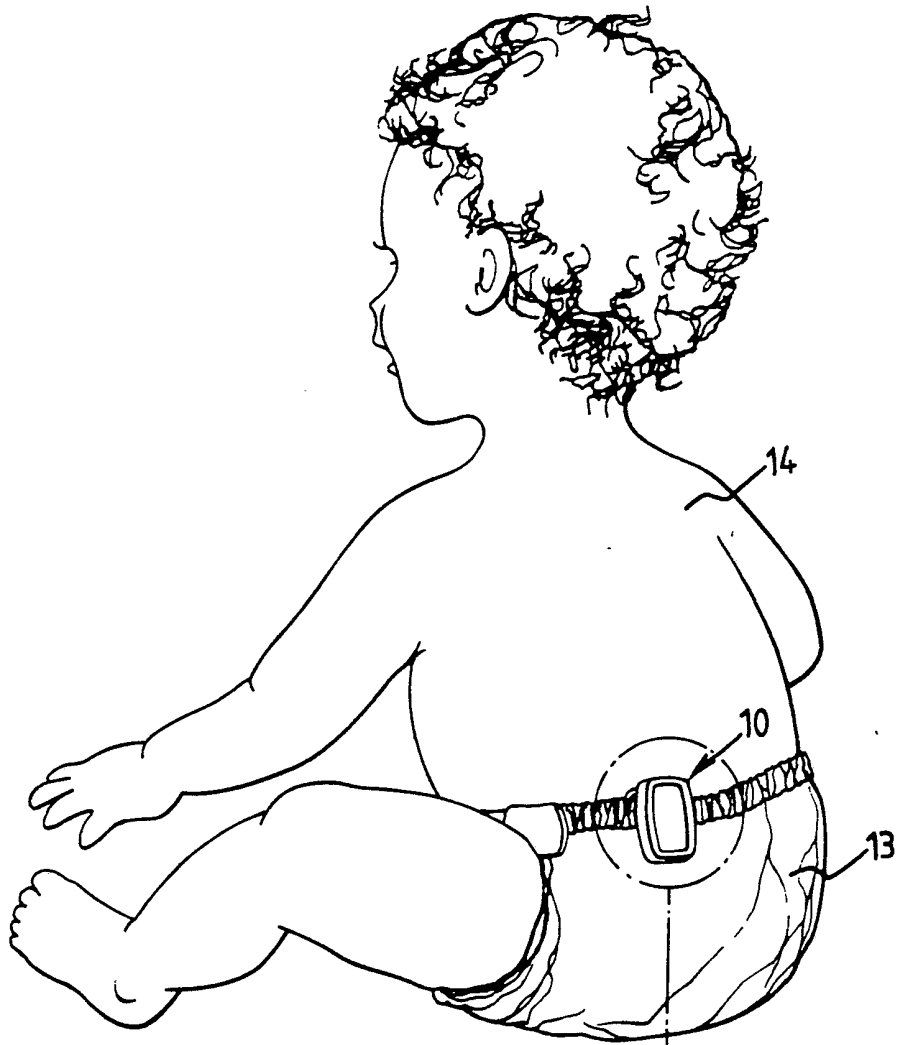
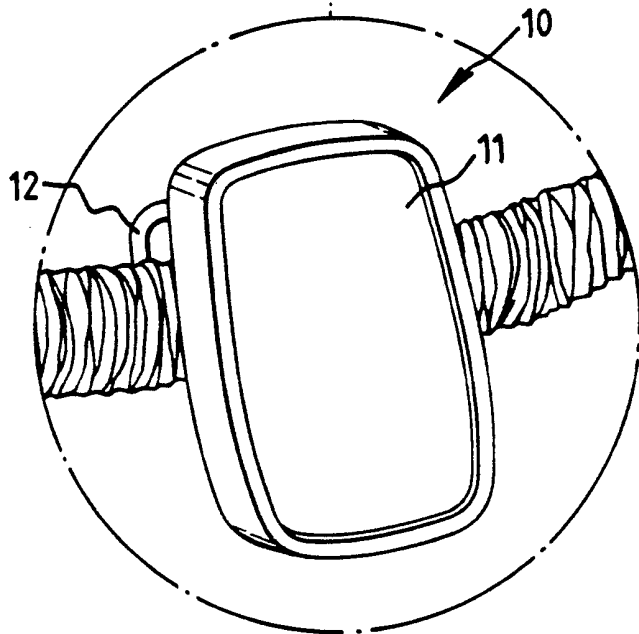


FIG. 1.



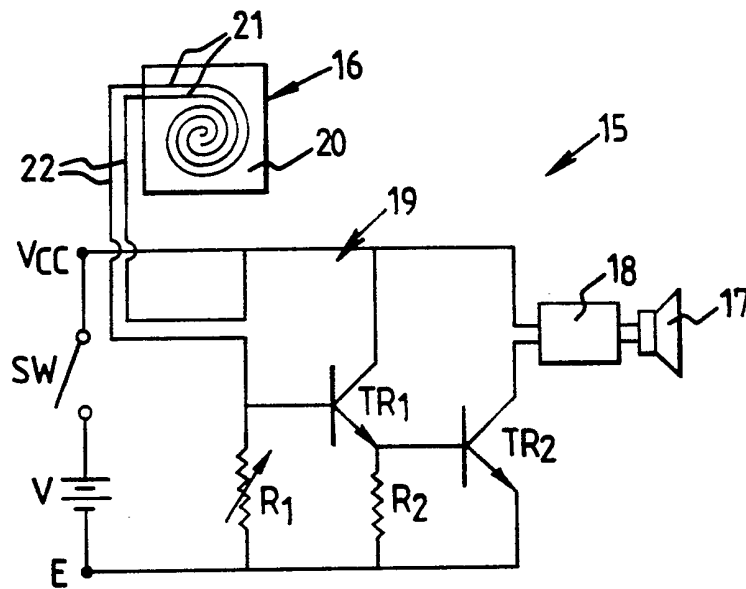


FIG. 2.

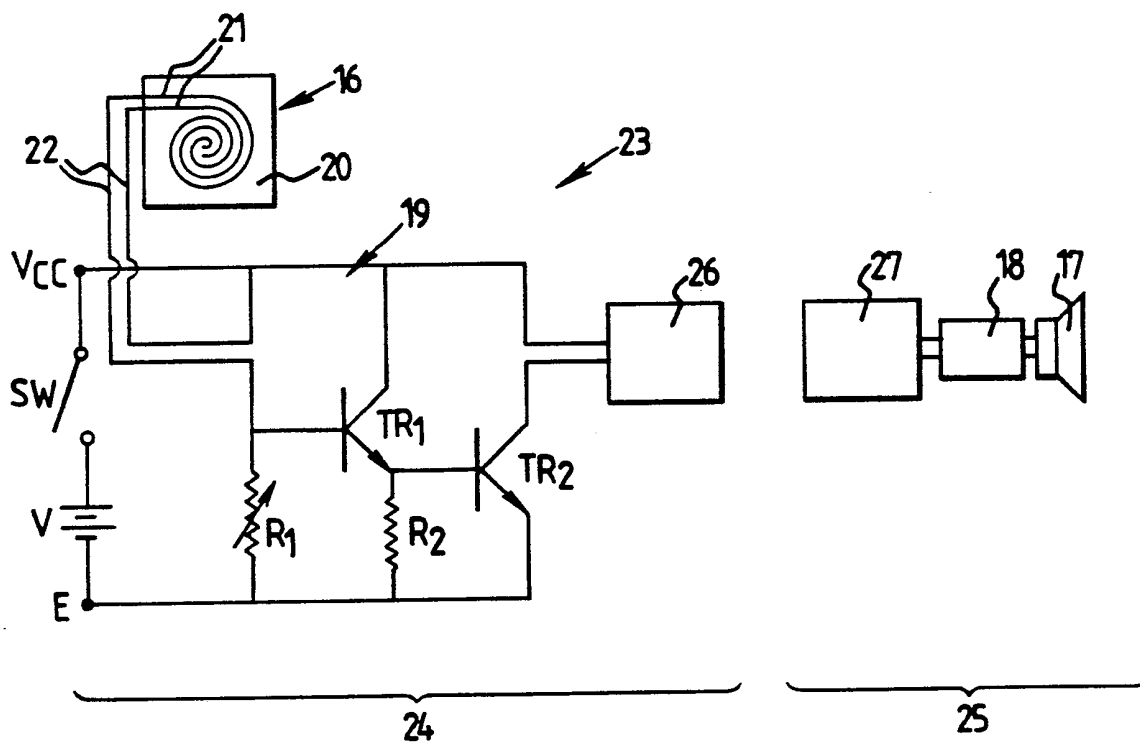


FIG. 3.

DETECTOR FOR USE IN CONNECTION WITH A NAPPY

The present invention relates to a detector for use in connection with a nappy.

In the broadest aspect, the invention provides a detector  
5 for use in connection with a nappy, said detector  
comprising a sensor adapted in use for location in or on a  
said nappy to provide an electrical signal when a said  
nappy becomes wet, an indicator, and a driver circuit for  
energising the indicator in response to an electrical  
10 signal received from the sensor.

In a preferred aspect, the invention provides a detector  
for use in connection with a nappy, said detector  
comprising a first unit, which includes a sensor and a  
transmitter, adapted for location in or on a said nappy to  
15 provide a radio signal when a said nappy becomes wet, and  
a separate second unit, which includes a receiver and an  
indicator, for providing a warning signal in response to  
the radio signal received from the first unit.

Other, preferred and/or optional features of the invention  
20 will be apparent from the following description and the  
accompanying claims 2 to 5 inclusive.

The invention will now be more particularly described, by

way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view showing a first embodiment of a detector in accordance with the invention, located on  
5 a nappy,

Figure 2 is a circuit diagram of the detector of Figure 1; and

Figure 3 is a circuit diagram of a second embodiment of a detector in accordance with the invention.

10 Referring now to Figure 1 of the drawings, a detector 10 shown therein comprises a casing 11 having an integral clip 12 for attaching the detector 10 to a nappy 13 worn by a child 14.

Figure 2 shows an electrical circuit 15 of the detector  
15 10. The circuit comprises a sensor in the form of a switch 16, a piezo-electric buzzer 17, an oscillator 18 for the piezo-electric buzzer 17, and a driver circuit 19 provided between the sensor switch 16 and the oscillator 18. The sensor switch 16 includes a printed circuit board  
20 20 bearing a pair of switch terminals in the form of two spiral conducting tracks 21 arranged in closely spaced apart relationship.

The driver circuit 19 comprises a series connection of a d.c. voltage supply V and an on-off switch SW between a circuit node  $V_{CC}$  and ground E, two resistors  $R_1$  and  $R_2$ , and two NPN bipolar transistors  $TR_1$  and  $TR_2$ . The transistor  $TR_1$  has its collector connected to the circuit node  $V_{CC}$ , and its base and emitter connected to the ground E through resistors  $R_1$  and  $R_2$ , respectively. The emitter of the transistor  $TR_1$  is connected to the ground E through the base-emitter path of the transistor  $TR_2$ .

The sensor switch 16 is connected across the circuit node  $V_{CC}$  and the base of the transistor  $TR_1$ , and the oscillator 18 is connected across the circuit node  $V_{CC}$  and the collector of the transistor  $TR_2$ .

The detector circuit 15 is contained in the casing 11, except the sensor switch 16 which is mounted on the outside of the casing 11 and connected to the circuit 15 by a pair of wires 22. In use, the casing 11 is located on the nappy 13 by the clip 12, and the sensor switch 16 is placed inside the nappy 13. The on-off switch SW is closed to enable the operation of the detector circuit 15.

When the child 14 urinates, the urine disperses and eventually reaches the two conducting tracks 21 on the

printed circuit board 20 of the sensor switch 16. The  
conducting tracks 21 are arranged sufficiently close  
together that the urine will create a low resistance path  
between the tracks 21. When this occurs, the two  
5 transistors TR<sub>1</sub> and TR<sub>2</sub> will turn on to connect the  
oscillator 18 across the voltage supply V. The oscillator  
18 provides an a.c. signal to operate the piezo-electric  
buzzer 17 to give an audible warning signal indicating  
that the child 14 has a wet nappy 13 which requires  
10 changing.

The sensor switch 16 and the wires 22 are cleaned and  
dried before the detector 10 is used again. It is  
envisaged that the detector 10 could be miniaturised and  
located inside a disposable nappy for disposal with the  
15 nappy after use.

Figure 3 shows a detector circuit 23 of a second  
embodiment of the invention, with like parts identified by  
the same numerals. The detector circuit 23 includes  
separate first and second parts 24 and 25. The first part  
20 24 includes a radio transmitter 26, and the second part 25  
includes a radio receiver 27.

The first part 24 also includes the sensor switch 16 and  
the driver circuit 19, the transmitter 26 being connected  
to the driver circuit 19 instead of the oscillator 18 of

Figure 2. The oscillator 18 and the piezo-electric buzzer 17 are also included in the second part 25. The first and second parts 24 and 25 are contained in separate casings (not shown).

5 The detector circuit 23 operates in a manner very similar to that of the detector circuit 15. The transmitter 26 provides a radio signal in response to the operation of the sensor switch 16. The receiver 27 receives the radio signal and operates the oscillator 18 and in turn the  
10 piezo-electric buzzer 17 to give an audible warning signal.

In use, the casing containing the first part 24 is attached to a nappy, and the sensor switch 16 is placed in the nappy in a manner similar to that of the detector 10 of Figure 1. The casing containing the second part 25 is  
15 carried by a person looking after a child wearing the nappy. This arrangement provides a convenient way of remote monitoring the condition of the nappy without disturbing the child, particularly when the child is asleep.

20 Various modifications and/or alterations of the invention will be apparent to persons skilled in the art without departing from the scope of the invention as defined by the accompanying claims.



CLAIMS

1. A detector for use in connection with a nappy, comprising a sensor adapted in use for location in or on a said nappy to provide an electrical signal when a said nappy gets wet, an indicator, and a driver circuit for energising the indicator in response to an electrical signal received from the sensor.

2. A detector as claimed in claim 1, further comprising a radio transmitter connected to the sensor, and a separate radio receiver which is co-operable with the transmitter to operate the indicator.

3. A detector as claimed in claim 1 or claim 2, wherein the sensor includes a printed circuit board bearing two electrical contacts disposed adjacent to each other.

4. A detector as claimed in any one of claims 1 to 3, wherein the indicator provides an audible warning signal.

5. A detector as claimed in claim 4, wherein the indicator includes a piezo-electric buzzer.

6. A detector for use in connection with a nappy, comprising a first unit, which includes a sensor and a transmitter, adapted for location in or on a said nappy to

provide a radio signal when a said nappy gets wet, and a separate second unit, which includes a receiver and an indicator, for providing a warning signal in response to a radio signal received from the first unit.

5 7. A detector for use in connection with a nappy, substantially as hereinbefore described with reference to Figures 1 and 2, or Figure 3 of the accompanying drawings.

8. A nappy provided with a detector as claimed in any one of the preceding claims.