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(56) Documents cited
EP 0206470 A1 **EP 0189204 A2** **EP 0157477 A1**
EP 0122866 A2 **WO 85/03586 A1** **US 4646241 A**

(58) Field of search
UK CL (Edition J) **G4A AKBX AUX**
INT CL⁴ **G06F**
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(54) Event recorder

(57) A data recorder capable of capturing transient events, of partricular use in detecting the changing situation just before the onset of Apnoea and Oxygen deficiency in infants. Both analogue and digital data are input to a microprocessor chip 1 and analysed. Also data from a real time clock 5 are input to the microprocessor in order that the date and time of any event recorded can be established. The data are stored sequentially in random access memory (RAM) in the form of a removeable "credit card" sized cartridge 7. When the cartridge is full the new data overwrite the oldest data ensuring that the most recent period is retained. When an event happens on any attached equipment the recorder is triggered into shutting down, e.g. after a preset interval. The RAM cartridge can then be removed and by inputting the data to a computer the period surrounding the event can be studied.,

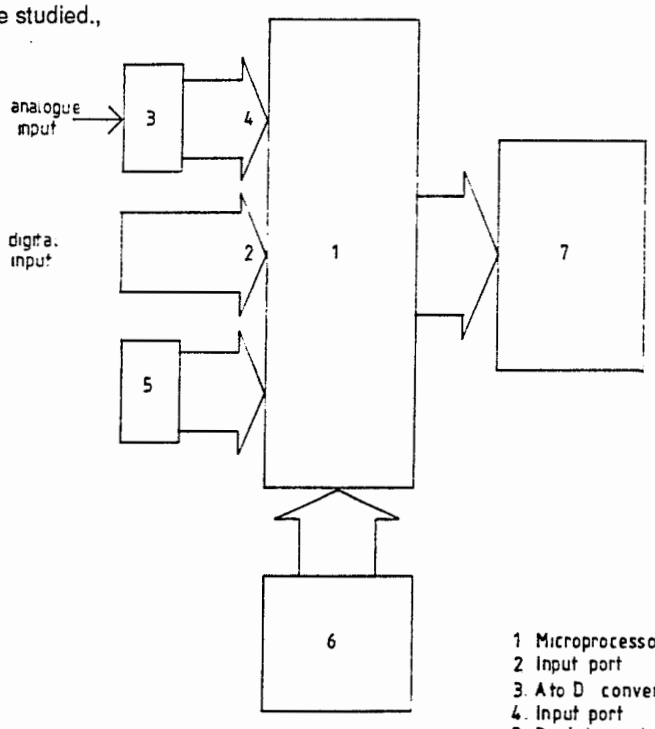

FIG 1 Schematic diagram

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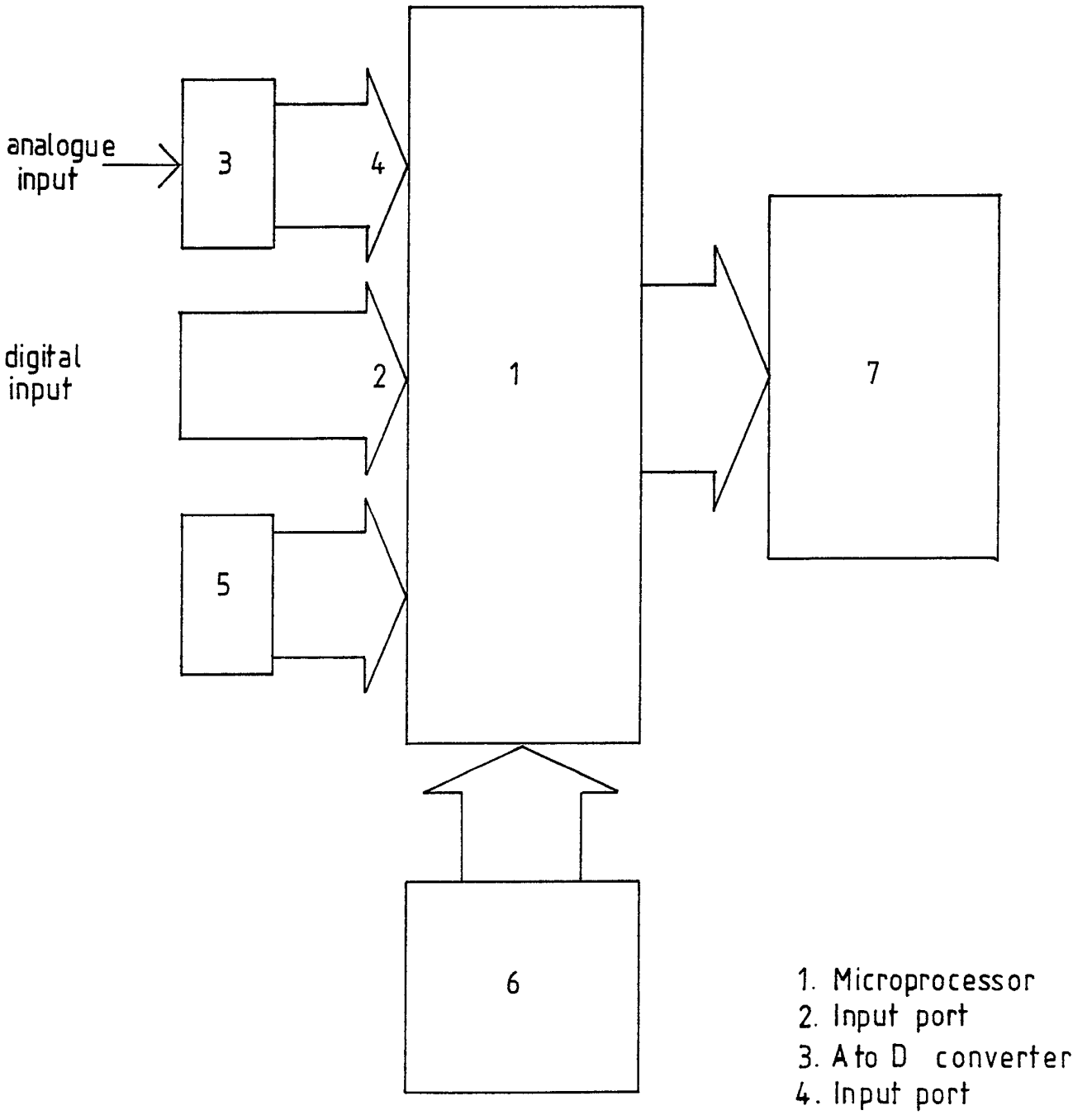

1. Microprocessor
2. Input port
3. A to D converter
4. Input port
5. Real time clock
6. Read only memory
7. Memory card

FIG 1 Schematic diagram

Specification.

EVENT RECORDER.

The invention is concerned with the problem of recording the changing situation just before the onset of Apnoea and Oxygen deficiency in infants.

A system is known which records data continuously on magnetic tape. The drawback of this system is that it produces copious amounts of data relating, in general, to a completely normal situation in order to pick up what may be a brief and infrequent event.

The present invention is designed to record only the data relevant to a specific event occuring.

The invention is an event recorder which is battery or mains powered and suitable for recording data from either analogue or digital sources such as temperature sensors, respiration transducers, oxygen monitors, etc.

Digital data are input in either serial or parallel form, under software control, through an input port 2 into a microprocessor 1.

Analogue data are input through an analogue to digital converter 3, which may be either a separate component or incorporated in the microprocessor 1, through an input port 4 into the said microprocessor 1.

Data from a real time clock 5 are also input to the same microprocessor 1.

The data are analysed in the microprocessor 1 by software related specifically to the task, such as comparison with preset alarm limits or statistical trends.

The software for controlling the inputs, analysing and storing the data is contained in read only memory 6.

After such analysis, the data are stored sequentially in an area of non-volatile random access memory which is contained in a removable cartridge or "credit card" type of memory card 7.

The real time clock data are also stored alongside the data for analysis, thus "time stamping" the data.

An area of the random access memory card 7 is set aside for storage of parameters relating to the data, i.e. data sampling rate, size of memory block, patient name and address in the case of medical recording.

The operating software contained in the read only memory 6 of the system can interact with the parameters stored on the removable memory card 7. This enables the operation of the unit to be changed by simply introducing a different memory card rather than making major changes to the read only memory 6 or the system itself.

When the memory card 7 is filled, the data continues to be stored from the beginning, overwriting the oldest data. The position of the most recently stored data is kept by means of a software "pointer" which is also stored on the memory card 7.

This storage process is continuous and by its nature can be thought of as circular in effect. The data immediately behind the software pointer is the newest data while the data immediately ahead of the software pointer is the oldest data.

When an event is detected such as crossing a preset alarm threshold, the software instructs the microprocessor 1 to stop the storage process, either immediately or after a preset time limit.

The memory card 7 can then be disconnected and contains:-

Data for the period immediately preceding the detected event stored in sequential form.

A pointer showing where said data begins.

Periodic clock data showing when the event occurred in real time.

The memory card 7 can then be connected to a remotely sited computer (not included in this specification) and the data extracted for analysis.

All numbers in the text relate to drawing Fig.1

CLAIMS

1. An event recorder which is capable of accepting input of analogue and digital data from a variety of sensors or transducers in serial or parallel form.

2. An event recorder as claimed in claim 1 incorporating an analogue to digital converter and microprocessor which may or may not be in the same component for the purpose of analysing the data as claimed in claim 1.

3. An event recorder as claimed in claims 1 and 2 incorporating a real time clock for the purpose of supplying data to the microprocessor as claimed in claim 2 so that the data as claimed in claim 1 may be studied with reference to the time they were recorded.

4. An event recorder as claimed in claims 1, 2 and 3 incorporating a Read Only Memory for the purpose of holding the program governing the operation of the whole equipment.

5. An event recorder as claimed in claims 1,2,3 and 4 incorporating a non-volatile Random Access Memory in the form of a removeable cartridge for the purpose of storing the data as claimed in claims 1 and 3.

6. An event recorder substantially as described herein with reference to Figure 1 of the accompanying drawing.