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(71) Applicants
Adrian John Hunter
Hawkwell Farmhouse, Stamfordham,
Newcastle-upon-Tyne, United Kingdom

Martin Stanley Hall
7 Elmway, Hilda Park, Chester-Le-Street, Co Durham,
United Kingdom

Robert Campbell Bailey
The Hemmels, West Farm Court, Wall, Hexham,
Northumberland, United Kingdom

(72) Inventors
Adrian John Hunter
Martin Stanley Hall
Robert Campbell Bailey

(74) Agent and/or Address for Service
Urquhart-Dykes & Lord
St Nicholas Chambers, Amen Corner,
Newcastle-upon-Tyne, NE1 1PE, United Kingdom

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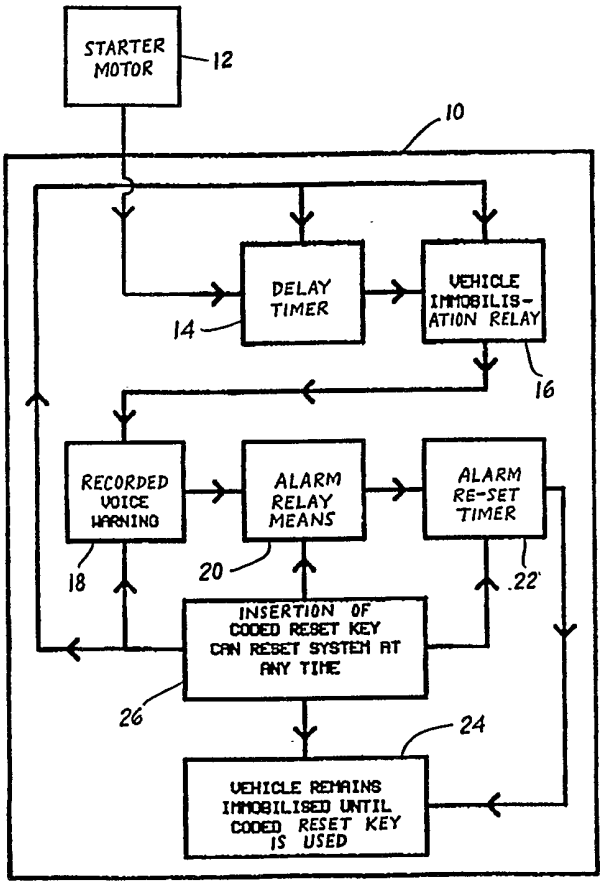
(56) Documents cited
GB 2121108 A GB 2009310 A EP 0244931 A
US 4992670 A US 4485887 A US 4452197 A
US 4302747 A US 4300495 A

(58) Field of search
UK CL (Edition L) F1B
INT CL[5] B60R 25/04

(54) Preventing unauthorised vehicle use

(57) A vehicle immobilising relay 16 operating on the engine ignition or fuel system is activated after a time delay each time the starter motor 16 is operated unless a microchip coded key is used after starting. The relay may also actuate a recorded voice warning, a siren and flashing of the vehicle direction indicators.



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

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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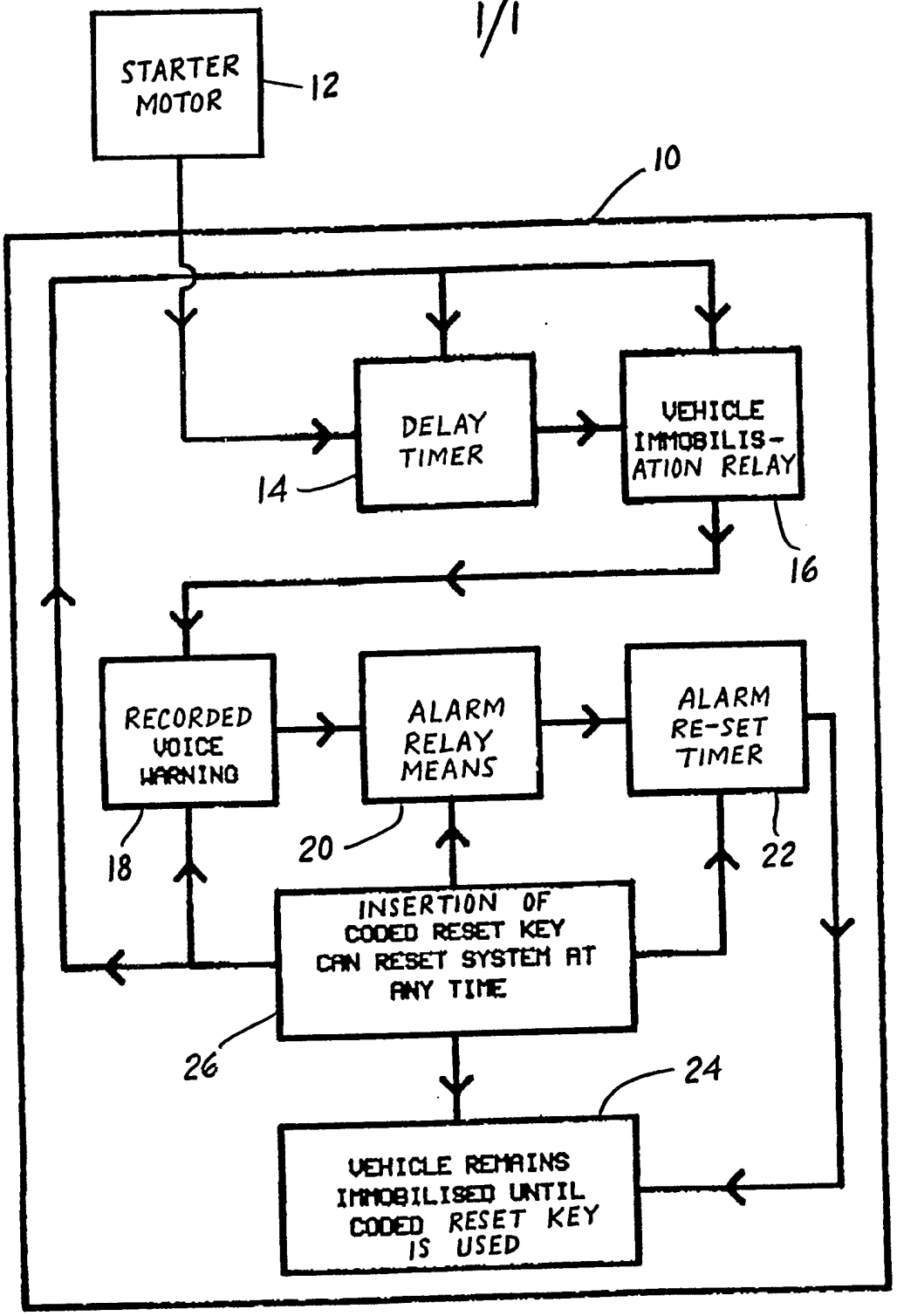
STARTER MOTOR
12
10
DELAY TIMER
14
VEHICLE IMMOBILIS-ATION RELAY
16
RECORDED VOICE WARNING
18
ALARM RELAY MEANS
20
ALARM RE-SET TIMER
22
INSERTION OF CODED RESET KEY CAN RESET SYSTEM AT ANY TIME
26
VEHICLE REMAINS IMMOBILISED UNTIL CODED RESET KEY IS USED
24

Method of and Means for Preventing Unauthorised Use of a Vehicle.

This invention relates to a method of and means for preventing unauthorised use of a vehicle.

The theft of motor vehicles has reached epidemic proportions and in an attempt to avoid such thefts it has become commonplace to install security systems which immobilise the vehicles and usually also operate audible and visible alarms. However, the systems employed hitherto have to be set by an authorised driver before he leaves the vehicle and disabled by him before he can restart the vehicle. This has the disadvantage that the authorised driver can forget or neglect to set the system. There is also the dangerous possibility that the system can inadvertently be activated when the vehicle is in motion.

The objects of the present invention are to provide full security without any action by the authorised driver when he leaves the vehicle, to immobilise the vehicle even

if an unauthorised driver uses the conventional starting procedure, and to obviate any risk of activating the security system when the vehicle is in motion.

According to one aspect of the invention, a method of preventing unauthorised use of a vehicle comprises utilising every start-up of the vehicle to activate means for causing immobilisation of the vehicle, de-activation of said means by an authorised driver being possible at any time after a start-up operation.

Preferably, de-activation of said means by an authorised driver is possible both during a short delay between a start-up operation and immobilisation of the vehicle, and after immobilisation thereof.

Preferably, also, said means also cause an alarm to operate at the same time as immobilisation occurs.

According to another aspect of the invention, means for carrying out the method are connected to a start-up mechanism so as to derive a pulse therefrom whenever said mechanism is operated, include a relay incorporated in control circuitry for a system essential to the running of the vehicle so as to render said system inoperative when activated by said pulse, and also include a device which maintains said system inoperative until said device is caused to de-activate said means by a re-set key.

Preferably, the device which maintains said system

inoperative, and the re-set key, both include identically coded micro-chips which co-act to cause de-activation of said means.

The system essential to the running of the vehicle may be the fuel supply system.

Alternatively, the system essential to the running of the vehicle may be the ignition system.

Preferably, a timer which causes a short delay before immobilisation occurs is interposed between the start-up mechanism and said relay.

Said relay preferably also operates a recorded voice warning within the vehicle when activated by said pulse.

Further relay means are preferably provided which operate alarm means when activated by said pulse.

Preferably, the alarm means comprise a siren and/or alternate flashing of the direction indicators at opposite sides of the vehicle.

Preferably, also, a timer cuts off the alarm means after a limited period.

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawing, which is a block diagram of means for preventing unauthorised use of a vehicle.

Referring now to the drawing, means 10 for preventing unauthorised use of a vehicle are connected to the solenoid

of its starter motor 12 so as to derive a pulse therefrom whenever said starter is operated. The pulse activates a timer 14 which after a few seconds' delay activates a relay 16 incorporated in control circuitry for the fuel supply system of the vehicle so as to render said system inoperative and thus immobilise the vehicle. As the same time as immobilisation occurs, the relay 16 transmits to a loud-speaker 18 within the vehicle a digitally-recorded repeated voice warning that the vehicle has been immobilised. Also at the same time as immobilisation occurs, relay means 20 operate alarm means. The relay means 20 comprise a relay which operates a siren to attract the attention of passers-by and a flip-flop relay which causes alternate flashing of the direction indicators at opposite sides of the vehicle in hazard warning mode. A timer 22 is provided to cut off the alarm means after a period not exceeding ten minutes, to comply with legal requirements concerning public nuisance. The means 10 include a device 24 which locks said means in immobilising condition until a special re-set key is inserted in a socket 26 associated with said device. The device 24 and the re-set key both include identically coded micro-chips with a very large number of possible combinations, which micro-chips co-act when said key is inserted to cause said device to de-activate the means 10, whereupon the fuel supply system of the vehicle becomes

operative and the vehicle is therefore no longer immobilised. An emergency battery power source (not shown) is included in the means 10. This source comes into operation if the vehicle's own power supply is disconnected, maintaining power to the means 10 when needed to keep the vehicle immobilised.

In operation, no action whatsoever is required on the part of the authorised driver to provide full security when he leaves the vehicle. When he returns and restarts the vehicle, using the normal ignition key, he preferably inserts the coded re-set key into its socket during the short delay immediately after starting and before immobilisation occurs. If he fails to do so, whereupon immobilisation does occur and the recorded voice warning and the alarms are operated, he promptly then inserts the coded re-set key in its socket to de-activate the means 10. However, if an unauthorised person starts the vehicle, either by using the normal ignition key or by so-called "hot-wiring" the vehicle to by-pass the ignition switch, immobilisation will occur and the recorded voice warning and the alarms are operated. Not having the coded re-set keys, the unauthorised person is unable to de-activate the means 10 and the vehicle will remain immobilised indefinitely, whilst the alarms will operate for some minutes to place the unauthorised person at risk and thereby frighten him away. The means 10 can be

de-activated later by the authorised driver using the coded re-set key.

Various modifications are possible. The pulse can be derived from some part of the starter motor 12 other than the solenoid, or from a different start-up mechanism such as a combustion initiation arrangement, irrespective of how the vehicle is powered. The pulse can be derived by direct connection, optically coupled connection, magnetic detection, current sensing, voltage sensing, motion sensing, thermal discharge, or gaseous discharge. The timers 14 and 22 can be electronic, electro-mechanical or mechanical. The system essential to the running of the vehicle can be a system other than the fuel supply system, for example the ignition system. The recorded voice warning can be omitted, and one or both of the alarm means can be omitted.

The invention is fundamentally superior to prior security systems because no action is required by the authorised driver to provide full security when he leaves the vehicle.

CLAIMS

1. A method of preventing unauthorised use of a vehicle, comprising using every start-up of the vehicle to activate means for causing immobilisation of the vehicle, de-activation of said means by an authorised driver being possible at any time after a start-up operation.

2. A method as claimed in claim 1, wherein said de-activation by an authorised driver is possible both during a short delay between a start-up operation and immobilisation of the vehicle, and also after said immobilisation.

3. A method as claimed in either of the preceding claims, wherein said means for causing immobilisation of the vehicle also causes an alarm to operate at the same time as immobilisation occurs.

4. Vehicle immobilisation apparatus for carrying out the method as claimed in any of the preceding claims, said apparatus being connected to a start-up mechanism for the vehicle so as to derive a pulse from said mechanism whenever said mechanism is operated,

including a relay incorporated in control circuitry for a system essential to the running of the vehicle so as to render said system inoperative when activated by a said pulse, and further including a device which maintains said system inoperative until said device is caused to de-activate said apparatus by a re-set key.

5. Apparatus as claimed in claim 4, wherein said device which maintains said system inoperative and said re-set key include identically coded micro-chips which co-act to cause de-activation of said apparatus.

6. Apparatus as claimed in either of claims 4 and 5, wherein said system essential to the running of the vehicle is the fuel supply system.

7. Apparatus as claimed in either of claims 4 and 5, wherein said system essential to the running of the vehicle is the ignition system.

8. Apparatus as claimed in any of claims 4 to 7, wherein a timer is interposed between the start-up mechanism and said relay.

9. Apparatus as claimed in any of claims 4 to 8, wherein said relay also operates a recorded voice warning when activated by a said pulse.

10. Apparatus as claimed in any of claims 4 to 9, including further relay means which operate alarm means when activated by a said pulse.

11. Apparatus as claimed in claim 10, wherein said alarm means comprises a siren and/or flashing of the vehicle's direction indicators.

12. Apparatus as claimed in either of claims 10 and 11, further including a timer to switch off the alarm means after a limited period.

13. Vehicle immobilisation apparatus substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

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Relevant Technical fields

(i) UK Cl (Edition L) F1B

(ii) Int Cl (Edition 5) B60R 25/04

Search Examiner

R J DENNIS

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

5 APRIL 1993

Documents considered relevant following a search in respect of claims 1 TO 13

Category (see over)	Identity of document and relevant passages		Relevant to claim(s)
Y	GB 2121108 A	(MOITIE)	1 at least
Y	GB 2009310 A	(MOURGEON)	1 at least
X	EP 0244931 A2	(SMITH)	1 at least
A	US 4992670	(PASTOR) see particularly from line 61, column 1 to line 13, column 2	1
X	US 4485887	(MORANO)	1 at least
X	US 4452197	(WEBER)	1 at least
X	US 4302747	(NATIONWIDE)	1 at least
X	US 4300495	(TREVINO)	1 at least

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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