

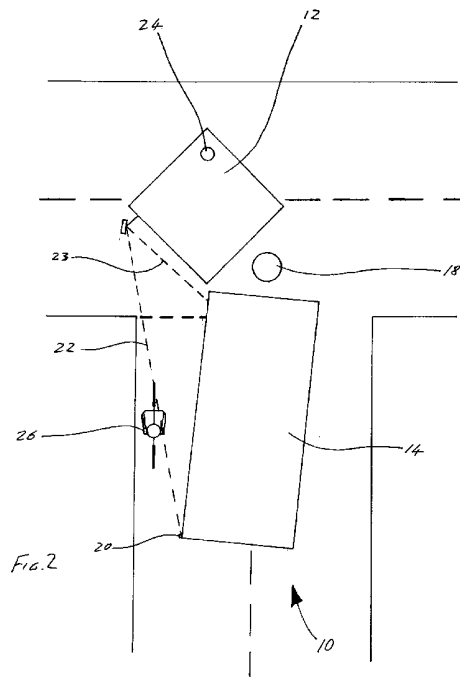
(12) UK Patent Application (19) GB (11) 2 399 555 (13) A

(43) Date of A Publication 22.09.2004

(21) Application No: 0306564.6	(51) INT CL ⁷ : B60R 1/02 , G09F 9/00
(22) Date of Filing: 21.03.2003	(52) UK CL (Edition W): B7J J69 G5C CAF
(71) Applicant(s): Mark Shearsby 14 Elm Close, SOUTHAM, Warwickshire, CV47 1HT, United Kingdom	(56) Documents Cited: GB 2259064 A WO 2002/102621 A1 US 6264337 B1 US 6151175 A US 5719713 A US 5306953 A US 5132851 A US 5056905 A
(72) Inventor(s): Mark Shearsby	(58) Field of Search: UK CL (Edition W) B7J INT CL ⁷ B60R Other: Online: WPI, EPODOC, JAPIO
(74) Agent and/or Address for Service: Withers & Rogers Goldings House, 2 Hays Lane, LONDON, SE1 2HW, United Kingdom	

(54) Abstract Title: **Articulated vehicle with a mirror which adjusts as the vehicle turns and a registration number display**

(57) A rear view mirror (16) for an articulated vehicle (10), is movable in response to relative movement between a cabin (12) and a trailer (14) to permit a driver of the vehicle (10) to view a predetermined area to the rear of the vehicle (10) relative to the trailer (14). The rear end of trailer is provided with an infrared combined emitter receiver (20) which communicates a direct line of sight signal (22) to the mirror (16). When the vehicle executes a sharp turn the emitted signal (22) is reflected back to the receiver (20) by operation of a motor drive of the mirror to ensure that the end of the trailer is tracked by the mirror. A mirror (16) so arranged permits an area towards the rear of the vehicle (10), such as the end of the trailer (14), to be within the reflected line of view of the driver. This provides the advantage that the driver's rearward view remains at an optimum which consequently improves the safety for other road vehicles (26). A registration number display apparatus (28) for an articulated vehicle (10), comprises a display means (28) mountable on the rear of the trailer (14), and a memory (30) containing a vehicle registration number of the cabin (12), wherein when a trailer (14) is coupled to the cabin (12), the display means (28) displays the cabin vehicle registration number.



GB 2 399 555 A

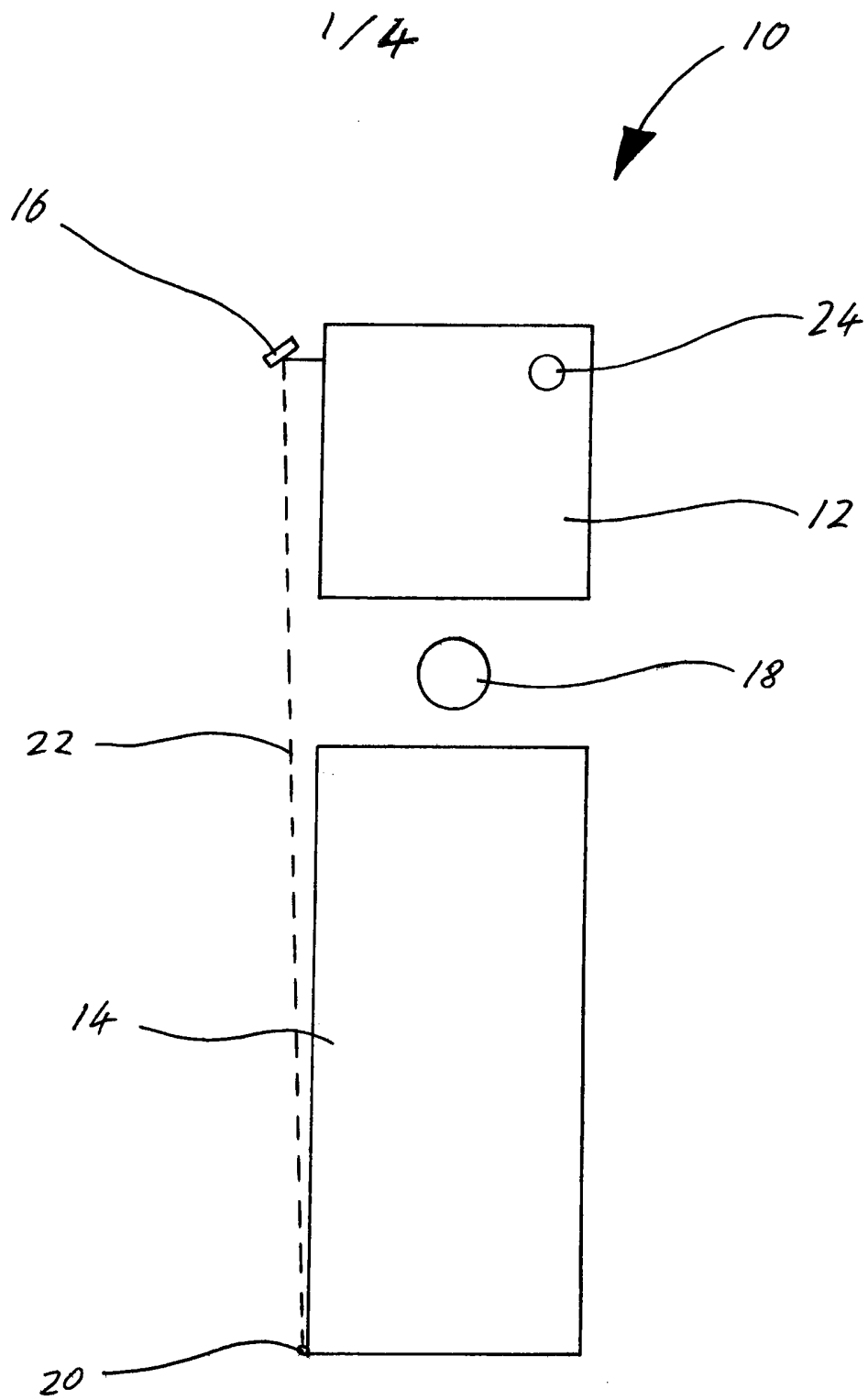


FIG. 1

2/4

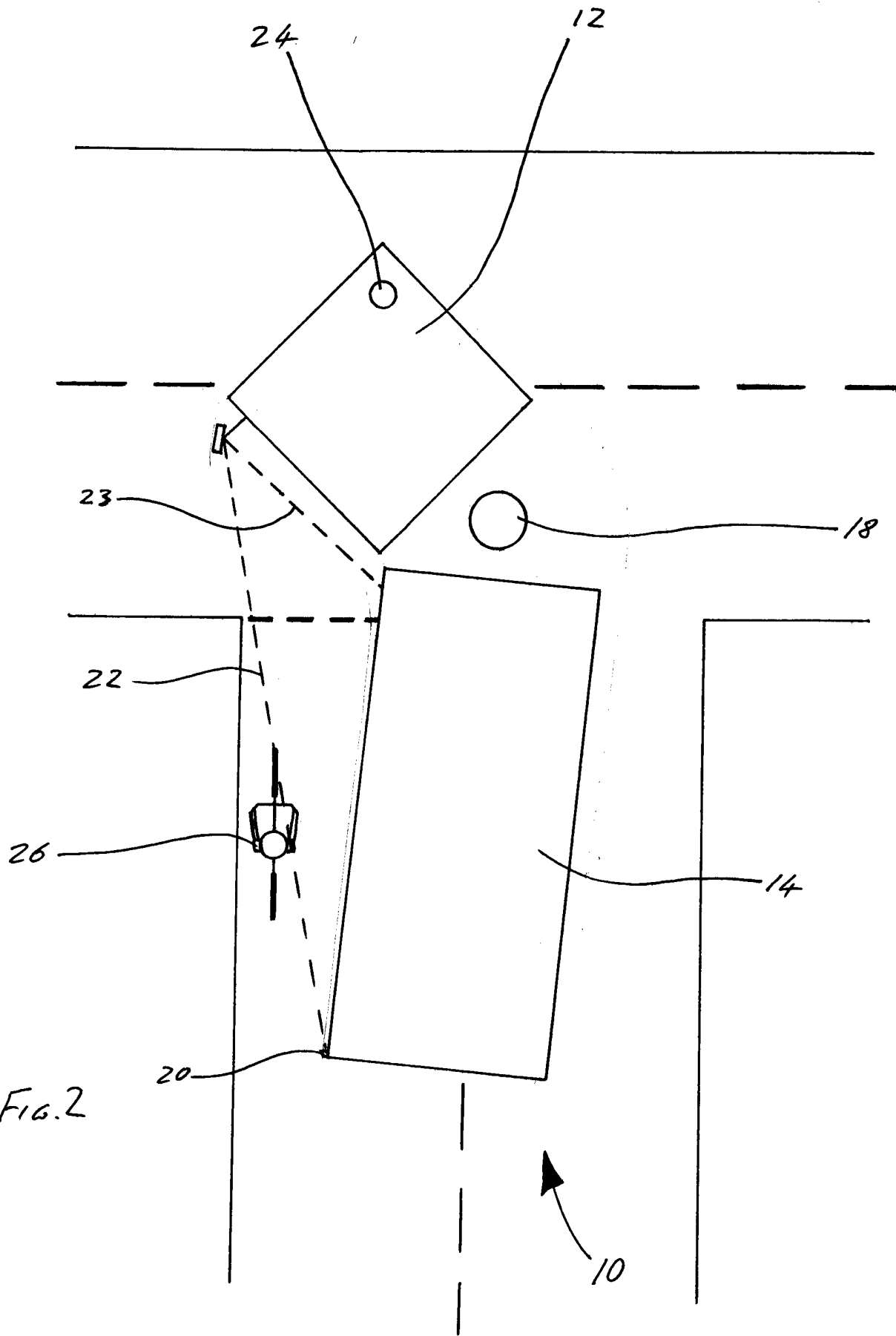
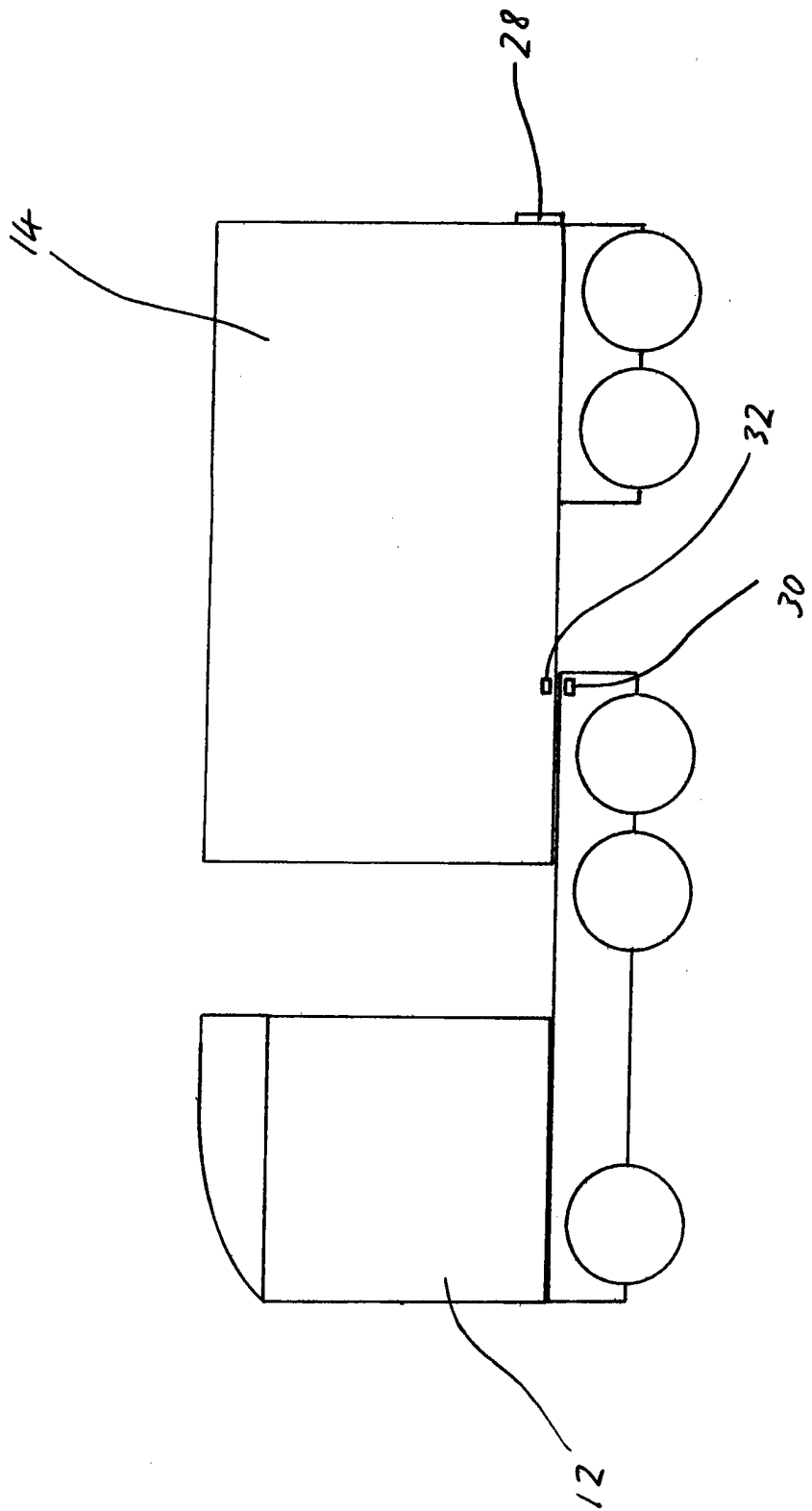


FIG. 2

3/4

FIG. 3



4/4

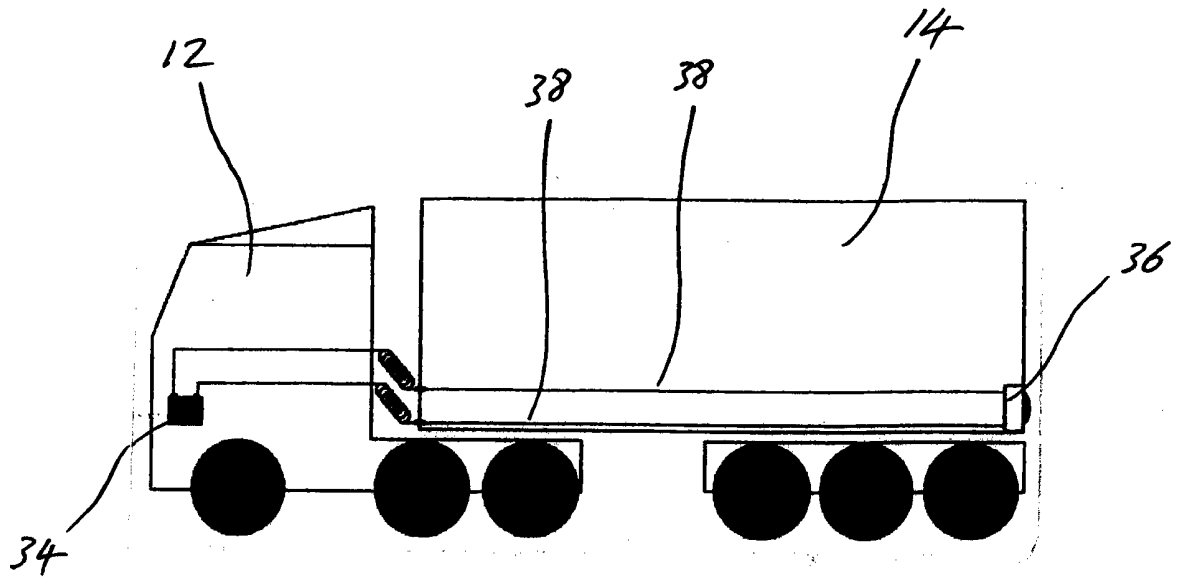


FIG. 4

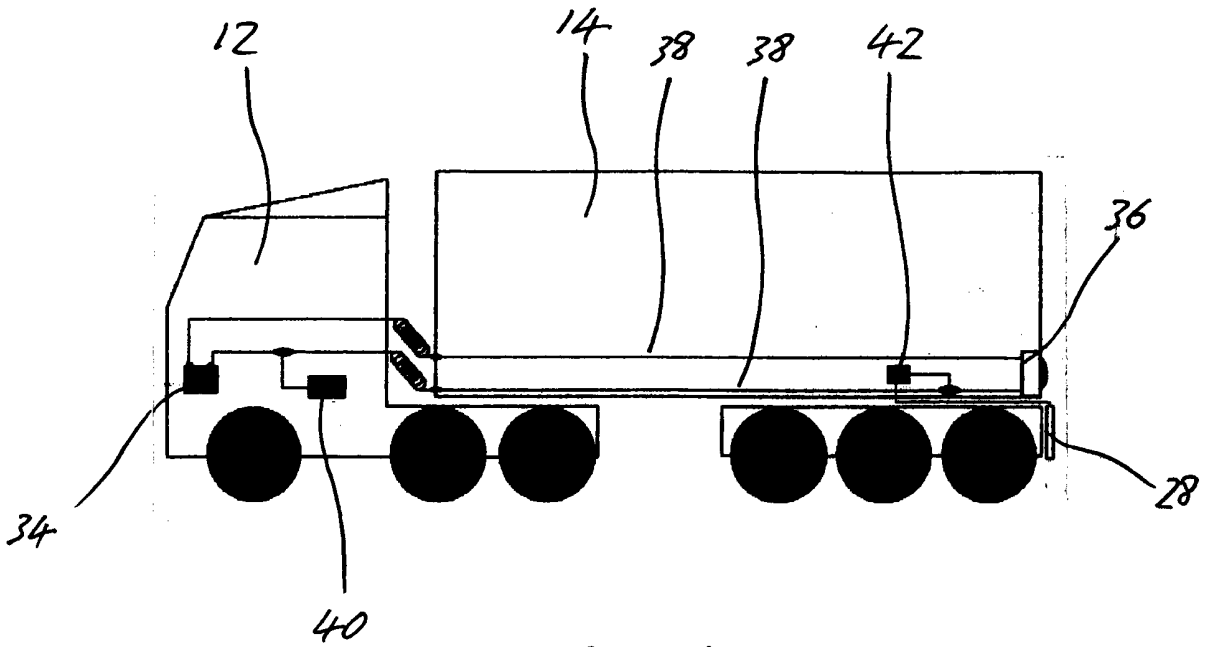


FIG. 5

Improvement in or relating to Articulated Vehicles

The present invention relates to articulated vehicles and in particular, although not exclusively, to improvements in or relating to the safety or security of articulated
5 vehicles.

Articulated vehicles such as lorries typically have large side mirrors to provide a driver with adequate visibility to the rear of the vehicle. The side mirrors can typically be operated by an electric motor to provide the best view for the driver. It is further known
10 to provide in addition to each side mirror a smaller convex mirror that is mounted near to the side mirror. The convex mirror permits a driver of the vehicle to view outwith the field of view of the vehicle side mirror.

A problem is associated with the aforementioned prior art mirror arrangement.
15 Although the side mirrors are large they do not always provide the required rear view for the driver. For example, when a right hand drive articulated lorry is driving in a country that drives on the left hand side of the road and executes a sharp left hand turn, movement of the cabin relative to the trailer during the turn means that the end of the trailer moves out of the field of view of the left hand mirror. Whilst the convex mirror
20 may provide a view of the end of the trailer this view is distorted and may not provide adequate visibility for the driver.

The cabin of an articulated lorry is typically required to pull different trailers. When a new trailer is coupled to the cabin the driver must change the number plate of the trailer
25 to match the number plate of the cabin. This task that is required to be performed by the driver may be forgotten. Further the driver may not attach the new trailer number plate securely to the trailer and it may fall off when the vehicle is travelling at speed. This creates a safety hazard to other road users and may lead to the driver being issued with a traffic violation penalty if caught by the police driving a cabin with a trailer
30 having no number plate. A traffic violation penalty may also be incurred if the

registration number of the trailer does not correspond to the registration number of the cabin.

What is required is an improved rear view mirror for an articulated vehicle.

5

A further requirement is an improved number plate display device for an articulated vehicle.

10 According to a first aspect of the invention there is provided a rear view mirror for an articulated vehicle comprising a cabin and a trailer, the mirror being mounted on the cabin and movable in response to relative movement between the cabin and the trailer to permit a driver of the vehicle to view a predetermined area to the rear of the vehicle relative to the trailer, in use.

15 A mirror so arranged permits an area towards the rear of the vehicle, such as the end of the trailer, to be within the reflected line of view of the driver. This provides the advantage that the driver's rearward view remains at an optimum which consequently improves the safety for other road vehicles. The invention is particularly useful for the driver of a right hand drive vehicle when executing a sharp left hand turn in a country
20 which drives on the left hand side of the road. The invention is also useful for the driver of a left hand drive vehicle when executing a sharp right hand turn in a country which drives on the right hand side of the road. The invention is also useful for the driver when parking the vehicle.

25 In a preferred embodiment, one of the trailer and the mirror has an emitter and the other of the trailer and the mirror has a receiver, the emitter being operable to provide a line of sight signal to the receiver to permit the mirror to track the end of the trailer, in use. The emitter and receiver may operate using infrared, ultrasound or microwaves or any other direct line of sight communication means. It will be appreciated that the skilled
30 person will know the requirements for such communication means.

In an alternative embodiment the trailer is provided with a combined emitter receiver, the emitter adapted to provide a signal to the receiver via the mirror and adapted to permit the mirror to track the end of the trailer, in use.

5 Preferably the mirror is adapted to be moved using a driving means. Such a driving means may comprise an electric motor. Typically such an electric motor is installed in prior art rear view mirrors to permit manual adjustment of the mirrors from inside the cabin.

10 A warning alarm may be provided if the direct line of sight signal is obstructed. Such obstruction may be due to another road user. The warning alarm provides an additional safety feature to conventional rear view mirrors.

In yet a further embodiment the mirror may be movable by a signal provided from a
15 fifth wheel or a steering wheel of the articulated vehicle.

According to a second aspect of the invention there is provided a registration number display apparatus for an articulated vehicle comprising a cabin and a trailer, the apparatus comprising a display means mountable on the rear of the trailer, and a
20 memory located on the cabin and containing a vehicle registration number of the cabin, wherein when the trailer is coupled to the cabin, the display means displays the cabin vehicle registration number, in use.

By coupled it is meant that the cabin and trailer are connected via the electrical systems
25 of the vehicle. A display apparatus so provided eliminates the need for a driver of the vehicle to change the number plate manually and may help to eliminate accidents due to loose registration number plates falling from the trailer when the vehicle is at speed. The display apparatus may also help to protect the livelihood of the driver since the driver may incur a traffic offence conviction for driving without a number plate or for
30 driving a cabin with a trailer displaying a different vehicle registration number to the cabin.

Preferably the registration number is communicated from the memory to the display means using existing electrical supply lines from the cabin to the trailer. Such a method of transmitting information along an electrical supply line is typically known as DSSS. The skilled person will know the necessary arrangements for transmission of information in this manner.

In one embodiment the memory and the display communicate through wireless means. For example the registration number may be stored in a radio frequency memory chip located near to the mechanical coupling point of the cabin and trailer. On mechanical coupling of the trailer and cabin the registration number of the cabin is read by a radio frequency reader on the trailer and displayed on the display. Alternatively the memory and display may communicate via a telecommunications link. Such a link may permit communication via a network such as the Internet. This means of communication provides a simple and cost effective method to permit information stored in the memory to be displayed on the display.

The display means may be a liquid crystal display or any other electrically operable display. The display may be arranged to display information relating to the country of origin, for example a GB sign that is required by law if a UK registered vehicle is driven abroad.

In an alternative embodiment the display means may be a hand portable device that is couplable to the memory. Such coupling may be by wireless means, for example a telecommunications link, or, alternatively, a physical connection. In this embodiment, the apparatus can be used to identify the cabin and to verify that the registration number displayed on the cabin corresponds to the registration number stored in the memory.

The memory may be adapted to store a vehicle identification number (V.I.N.) of the cabin or any other information relating to the cabin such as the owner and the registered keeper together with contact details such as an address or a telephone number. This information may be displayed on the display upon coupling of the apparatus to the memory. Storing and reading of such information may inhibit theft of the cabin.

In yet a further embodiment the memory may be provided at a remote location from the vehicle and the display apparatus. Such an arrangement provides a convenient method for controlling the contents of the memory and may help to improve security of the apparatus. In such an arrangement, the memory may be a hard disk of a computer.

Other features of the invention will be apparent from the following description of a preferred embodiment shown by way of example only in the accompanying drawings, in which;

10

- Figure 1 is a plan view schematic representation of an articulated vehicle according to a first aspect of the present invention.

- Figure 2 is a plan view schematic representation of the articulated vehicle of Figure 1 turning left at a T-junction.

15

- Figure 3 is a side view schematic representation of an articulated vehicle having a display apparatus according to a second aspect of the invention.

- Figure 4 is a side view schematic representation of an articulated vehicle.

- Figure 5 is a side view schematic representation of the articulated vehicle of Figure 4 according to the second aspect of the invention.

20

Referring firstly to Figure 1 there is shown a plan view schematic representation of an articulated vehicle in accordance with a first aspect of the present invention, generally designated 10. The vehicle 10 has a cabin 12 and a trailer 14. The cabin 12 has a rear view side mirror 16 that has a motor drive (not shown). The cabin 12 is coupled to the trailer 14 by a fifth wheel 18. The trailer 14 is further provided with an infrared combined emitter receiver 20 which communicates an infrared direct line of sight signal 22 to the mirror 16. A steering wheel 24 of the cabin 12 is also shown.

25

Referring now to Figure 2 there is shown a plan view schematic representation of the articulated vehicle 10 of Figure 1 turning left at a T-junction. Figure 2 shows the vehicle 10 executing a left hand turn under maximum steering lock whereby the T-junction is required to be straddled so that the vehicle 10 can execute the turn. The

30

combined emitter receiver 20 causes the mirror to track the rear of the trailer to assist the driver in making the turn and to allow the driver to see if the space between the trailer 14 and the near side kerb is free from other road users. In Figure 2 a cyclist 26 is shown in-between the trailer 14 and the near side kerb. The signal 22 to permit the mirror to track the end of the trailer is broken by the cyclist which causes an alarm to be sounded in the cabin. The skilled person will know the arrangements to permit such an alarm to be sounded.

In use the combined emitter receiver 20 emits an infrared signal 22 that is directed to the mirror 16. The signal 22 is reflected from the mirror 16 back to the emitter receiver 20. If the vehicle 10 executes a sharp turn the emitted signal 22 is reflected back to the receiver 20 by operation of the motor drive of the mirror 16. This ensures that the end of the trailer 14 is tracked by the mirror 16. The reflected line of sight 23 represents the driver's view without the apparatus according to the first aspect of the present invention fitted to the vehicle 10. It can be seen from Figure 2 that the driver cannot see the cyclist 26 in the reflected view represented by the reflected line of sight 23.

Referring now to Figure 3 there is shown a side view schematic representation of an articulated vehicle having a display apparatus according to a second aspect of the invention. The apparatus comprises a display 28 mounted on the rear of a trailer 14, a pre-programmed memory 30 containing the vehicle registration number of the cabin 12 which is adapted to be read by a radio frequency reader, and a control device 32 comprising the radio frequency reader. The memory 30 is mounted on the cabin 12 and the control device 32 is mounted on the trailer 14. The display 28 is a digital device capable of providing a yellow reflective background with black numerals to illustrate a registration number.

In use a trailer 14 is coupled to the cabin 12. Upon coupling, the control device 32 reads the registration number stored in the memory 30 using the radio frequency reader. The controller 32 then operates the display 28 to display the vehicle registration number of the cabin 12. A display apparatus so arranged permits any cabin 12 to be coupled to

any trailer 14 so that the vehicle registration number of the cabin 12 can be displayed on the display 28.

5 The apparatus according to the second aspect of the present invention can also be used to determine the identity of the cabin 12. If the memory is provided with further information such as the Vehicle Identification Number (V.I.N.) of the cabin 12, the memory can be read by a portable version of the display 28 and control device 32. The information displayed on the display 28 can be checked to ensure that it corresponds to the vehicle registration number and VIN displayed on the cabin 12.

10

Turning now to Figure 4 there is shown a side view schematic representation of an articulated vehicle. The cabin 12 has a battery 34 that provides power to lights 36 of the trailer 14. The power is supplied from the battery 34 to the lights 36 via wires 38.

15

Referring now to Figure 5 there is shown a side view schematic representation of the articulated vehicle of Figure 4 according to the second aspect of the invention. Like features are shown with like reference numerals. In Figure 5 the cabin 12 is provided with a controller 40. The controller 40 has a memory adapted to store a vehicle registration number. The controller 40 is adapted to transmit the registration number down the wires 38. The controller 40 uses means for sending information down a power cable, the means typically known as DSSS. The trailer 14 is provided with a receiving apparatus 42. The receiving apparatus 42 permits the vehicle registration number to be read. The receiving apparatus 42 is connected to the display 28 so that the vehicle registration number can be displayed.

20

25 The box container 40 requires a constant power supply. Due to the manner in which the electronics of the vehicle operate the power supply is required to be regulated. This can be achieved by using capacitors (not shown).

30

Claims

1. A rear view mirror for an articulated vehicle comprising a cabin and a trailer, the mirror being mounted on the cabin and movable in response to relative movement
5 between the cabin and the trailer to permit a driver of the vehicle to view a predetermined area to the rear of the vehicle relative to the trailer, in use.
2. A mirror according to claim 1, wherein one of the trailer and the mirror has an emitter and the other of the trailer and the mirror has a receiver, the emitter being
10 operable to provide a line of sight signal to the receiver to permit the mirror to track the end of the trailer, in use.
3. A mirror according to claim 2, wherein the emitter and receiver operate using one of infrared, ultrasound and microwaves.
15
4. A mirror according to claim 2 or claim 3, wherein a warning alarm may be provided if the direct line of sight signal is obstructed.
5. A mirror according to claim 1, wherein the trailer is provided with a combined
20 emitter receiver, the emitter adapted to provide a signal to the receiver via the mirror and adapted to permit the mirror to track the end of the trailer, in use.
6. A mirror according to any preceding claim, wherein the mirror is adapted to be moved using a driving means.
25
7. A mirror according to claim 6, wherein the driving means comprises an electric motor.
8. A mirror according to claim 1, wherein the mirror is movable by a signal
30 provided from one of a fifth wheel and a steering wheel of the articulated vehicle.

9. A registration number display apparatus for an articulated vehicle comprising a cabin and a trailer, the apparatus comprising a display means mountable on the rear of the trailer, and a memory located on the cabin and containing a vehicle registration number of the cabin, wherein when the trailer is coupled to the cabin, the display means displays the cabin vehicle registration number, in use.
- 5
10. An apparatus according to claim 9, wherein the registration number is communicated from the memory to the display means using existing electrical supply lines from the cabin to the trailer.
- 10
11. An apparatus according to claim 9, wherein the memory and the display communicate through wireless means.
12. An apparatus according to claim 11, wherein the registration number is stored in a radio frequency memory chip located near to the mechanical coupling point of the cabin and trailer.
- 15
13. An apparatus according to claim 11, wherein the memory and display communicate via a telecommunications link.
- 20
14. An apparatus according to any of claims 9 to 13, wherein the display means is a hand portable device that is couplable to the memory.
15. An apparatus according to claim 14, wherein the coupling is provided by wireless means.
- 25
16. An apparatus according to claim 15, wherein the wireless means is a telecommunications link.
- 30
17. An apparatus according to any of claims 9 to 16, wherein the memory is adapted to store other information relating to the cabin.

18. An apparatus according to claim 17, wherein said other information includes one of a Vehicle Identification Number, the owner, the registered keeper, a country of origin, and contact details.
- 5 19. An apparatus according to claim 17 or claim 18, wherein said information is displayed on the display upon coupling of the apparatus to the memory.
20. An apparatus according to any of claims 9 to 19, wherein the display means is an electrically operable display.
- 10 21. An apparatus according to claim 20, wherein the display means is a liquid crystal display.
22. An apparatus according to claim 9, wherein the memory is provided at a
15 remote location from the vehicle and the display apparatus.
23. An apparatus according to claim 22, wherein the memory is a hard disk of a computer.
- 20 24. A mirror as substantially described herein with reference to Figs. 1 or 2 of the accompanying drawings.
25. An apparatus as substantially described herein with reference to Figs. 3 to 5 of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0306564.6
Claims searched: 1 to 8

Examiner: Colin Thompson
Date of search: 17 May 2004

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-8	US 6264337 B1 (Rannells) See Figs 5 & 6
X	1-3,6-8	US 5132851 A (Bomar) See whole document
X	1-4,6,7	US 5306953 A (Weiner) See whole document
X	1-3,5-7	US 6151175 A (Osha) See whole document
X	1-3,6,7	US 5719713 A (Brown) See whole document
X	1,2,5-7	US 5056905 A (Jensen) See whole document
X	1,2,6,7	WO 02/102621 A1 (South Bank University Enterprises Ltd)
X	1,2,6,7	GB 2259064 A (Standen) See whole document

Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W:

B7J

Worldwide search of patent documents classified in the following areas of the IPC⁷:

B60R

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, JAPIO