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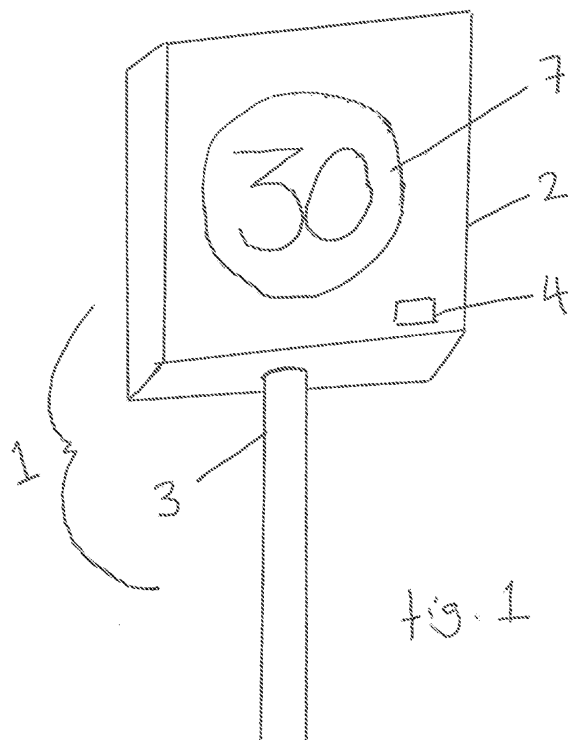
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G08G 1/0967 (2006.01)

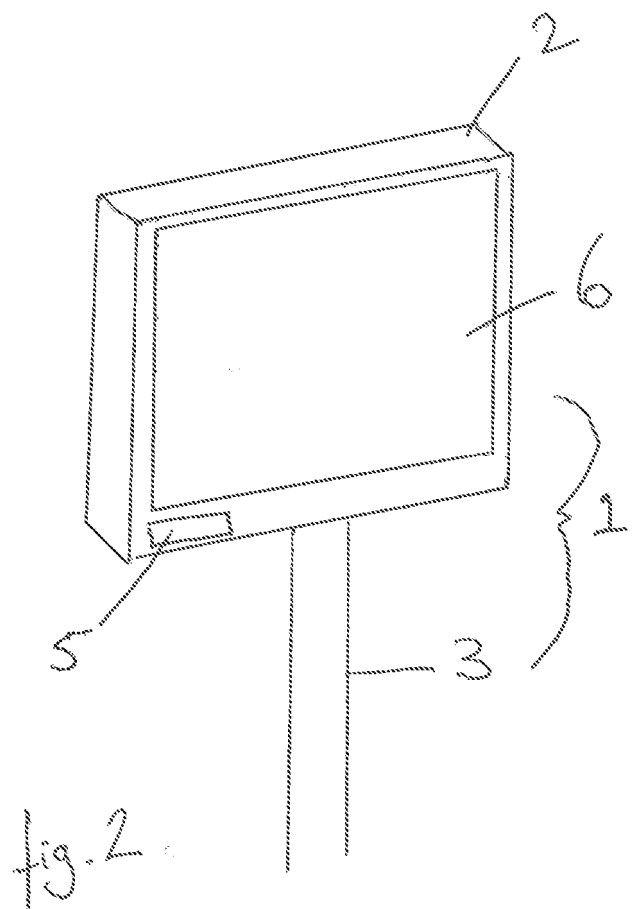
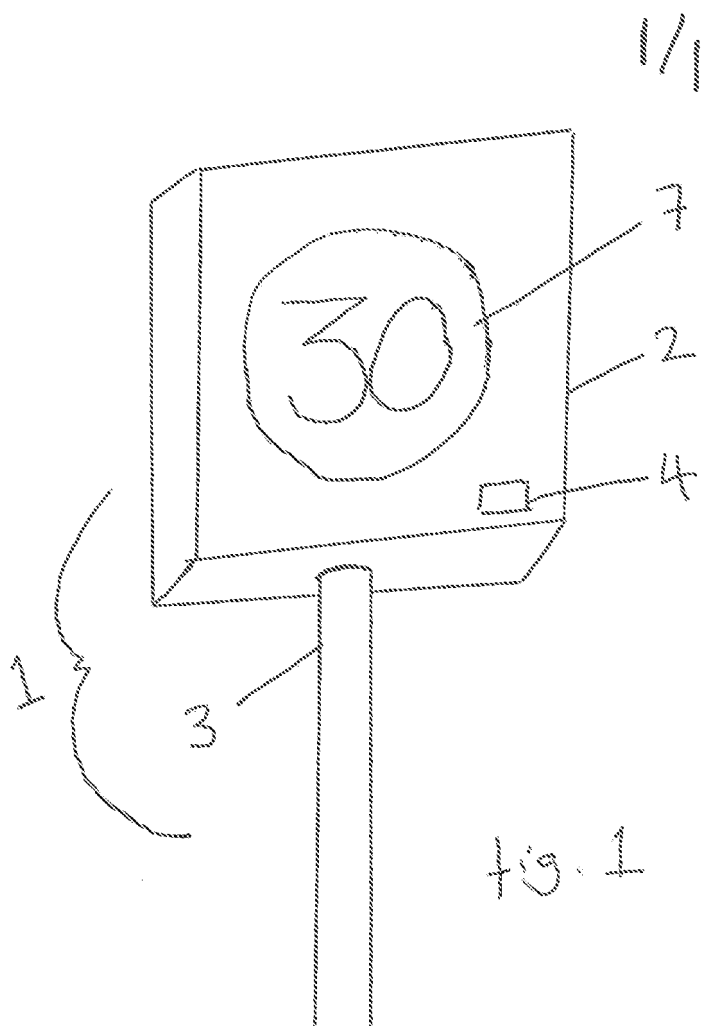
(56) Documents Cited:
EP 1422678 A2 **WO 2011/094024 A2**
DE 010248968 A1 **FR 002620253 A1**
US 4816827 A **US 20050280552 A1**

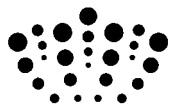
(58) Field of Search:
INT CL **B60K, B60T, G08G**
Other: **Online: WPI, EPODOC**

(54) Title of the Invention: **Traffic speed limit sign, communications systems and methods of communication**
Abstract Title: **Traffic speed limit sign which detects an approaching vehicle and transmits speed information for display to driver as he passes behind the sign**

(57) Communication between a traffic speed limit sign 1 and an oncoming vehicle wherein the vehicle is detected 4; a signal is transmitted from the sign to a receiver on-board the vehicle; and information is displayed inside the vehicle in response to the transmitted signal. Motion of the vehicle toward the sign may cause the signal to be transmitted. The signal may comprise speed information, e.g. the speed limit 7 displayed on the sign, which may be displayed in the vehicle. The arrangement may be powered by a solar panel at the rear of the sign. The solar panel 6 and transmitter 5 may be located at the rear of the sign such that the vehicle receives the signal when it enters the area governed by the sign-posted speed limit.







The following terms are registered trademarks and should be read as such wherever they occur in this document:

ZigBee, Bluetooth

10 Traffic Speed Limit Sign, Communications Systems and Methods of Communication

Field of the Invention

15 The invention relates to traffic speed limit signs, communication systems and methods of communication.

Background to the Invention

20 The closest prior art known to the applicant is satellite navigation technology which is able to inform drivers of the speed limit of the road they are driving on. However, the disadvantage of this is that this technology requires frequent updates from the internet so that speed limit changes are kept current. These systems cannot take account of temporary speed limit changes such as changes due to road works or public events. Other prior art known to the applicant are traffic signs that use radar to detect oncoming
25 vehicles and a warning is given to an over speed vehicle to remind a driver of the speed limit.

30 The disadvantage with these signs is that the warning is observed only outside of the oncoming vehicle.

Summary of the Invention

In the first broad independent aspect the invention provides a traffic speed limit sign comprising a communication system; said communication system incorporating a detector
 5 for detection of an oncoming vehicle; and a transmitter for communicating to said vehicle; whereby the motion of said vehicle toward said traffic sign activates said communication system; whereby activation of said communication system causes said transmitter to transmit a signal to said vehicle in order to display information inside said vehicle.

10 The advantage of this sign is that it provides the driver of a vehicle with clearer speed limit information when the vehicle is passing a particular area. Additionally, the speed limit can be kept up to date to take account of changes due to road works or public events. The clearer speed limit information ensures that a driver is more likely to respond to a change in speed limit of a road.

15 Preferably, said traffic speed limit sign is further powered by a solar panel that is located at the rear of the sign. This configuration provides a low maintenance, preferably monolithic and compact sign.

20 Preferably, said transmitter for communicating to said vehicle is located at the rear of said sign. This provides the means of transmitting a signal to said vehicle once it has passed said sign in order to be received and displayed inside said vehicle whilst it is inside the designated speed limit zone.

25 Preferably, a communication system comprises a traffic speed limit sign and a vehicle which comprises a receiver, for receiving said signal and a display unit for displaying information inside said vehicle following the receipt of the signal.

This configuration is advantageous because it enables the communication of speed
 30 information between the traffic speed limit sign and an oncoming vehicle so that speed information can be displayed inside said oncoming vehicle.

Preferably, a method of communication between a traffic speed limit sign and an oncoming vehicle, comprising the steps of: detecting an oncoming vehicle; transmitting a signal, containing speed information, to a receiver of said vehicle; and displaying the transmitted signal inside said vehicle. This is advantageous because the transmission of a signal, incorporating speed information, to an oncoming vehicle allows the driver of said vehicle to more easily view the speed information of the road. This is especially significant where the speed information is temporary due to changes such as road works or public events. Communication received inside said vehicle will be advantageous over speed limit information displayed outside of the vehicle.

Brief Description of the Figures

Figure 1 shows the front of a traffic speed limit sign.

Figure 2 shows the back of a traffic speed limit sign.

Detailed Description of the Figures

Figure 1 shows a traffic speed limit sign indicated by 1, which incorporates a head unit 2 and a support post 3. Said head unit comprises a front face, facing towards an oncoming vehicle, and a back face, facing in the opposite direction to the front face. Said front face incorporates a visual indicator comprising LEDs 7. Said visual indicator illustrates the speed limit of a particular area of road. Joining said front and back faces is at least one panel comprising the top, bottom and sides of said head unit. Where the front and back faces of the head unit are circular, only one side panel will be present. Where the front and back faces of the head unit are triangular, there will be three side panels. Where the front and back faces of the head unit are square, there will be four side panels. The traffic speed limit sign also incorporates a support post 3, located at the bottom of said head unit. Said support post fits into said head unit and extends down towards the ground so it may offer support to the traffic speed limit sign. The head unit incorporates a detector 4. The detector is positioned so that it faces in the same direction as said front face of the head unit. The detector is positioned so that, in use, it can detect a vehicle moving towards the front face of the traffic speed limit sign.

Figure 2 shows a traffic speed limit sign 1 from the rear, facing towards the back face. The traffic speed limit sign incorporates a transmitter 5, and a solar panel 6. The communication system incorporated into said traffic speed limit sign is powered by said solar panel. Power may be stored in a battery or by similar means. Said solar panel is
5 attached to and is the same shape as the back face of said head unit and faces away from said sign. Said transmitter 5, is located at the rear of said sign. It faces in the same direction as the back face of said head unit so that it may effectively communicate with vehicles that have passed said sign. Detection of an oncoming vehicle by said detector 4 causes the proliferation of a signal, containing speed information, from the transmitter 5.
10 Communication of said signal may be proliferated via radar, Bluetooth, radio-frequency identification (RFID), ZigBee or other wireless methods. The communication of said signal is directed towards a receiver incorporated in said oncoming vehicle. Said receiver subsequently sends said received information to a display unit within said vehicle. Said display unit may comprise a satellite navigation system or heads-up-display unit.

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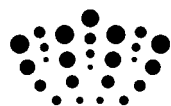
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Claims

1. A traffic speed limit sign comprising a communication system; said communication system incorporating a detector for detection of an oncoming vehicle; and a transmitter for communicating to said vehicle; whereby the motion of said vehicle toward said traffic sign activates said communication system; whereby activation of said communication system causes said transmitter to transmit a signal to said vehicle in order to display information inside said vehicle.
2. A traffic speed limit sign according to claim 1, wherein said communication system is powered by a solar panel, located at the rear of said sign.
3. A traffic speed limit sign according to either claim 1 or claim 2, wherein said transmitter for communicating to said vehicle is located at the rear of said sign.
4. A communication system comprising a traffic speed limit sign in accordance with any of the preceding claims; and a vehicle which comprises a receiver, for receiving said signal and a display unit for displaying information inside said vehicle following the receipt of the signal.
5. A method of communication between a traffic speed limit sign and an oncoming vehicle, comprising the steps of:
 - detecting an oncoming vehicle;
 - transmitting a signal, containing speed information, to a receiver of said vehicle; and
 - displaying the transmitted signal inside said vehicle.
6. A traffic speed limit sign substantially as hereinbefore described and/or illustrated in any appropriate combination of the accompanying text and/or figures.



Application No: GB1221569.5

Examiner: Ms Amanda Mason

Claims searched: 1-6

Date of search: 21 March 2013

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	1-2,4	EP1422678 A2 (FRANCE TELECOM)
X	1-2,4	US4816827 A (BALOUTCH et al)
A	-	WO2011/094024 A2 (SEREX) See Figs. 1, 3-4; Paragraphs [0015]-[0016], [0049]-[0050]
A	-	DE10248968 A1 (DEUTSCHE TELEKOM) See Fig. 1; WPI & EPODOC abstracts
A	-	US2005/280552 A1 (DIPIAZZA) See Figs. 1,4; paragraphs [0012]-[0016], [0034], [0035]

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^X:

Worldwide search of patent documents classified in the following areas of the IPC

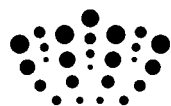
B60K; B60T; G08G

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

WPI,EPODOC

International Classification:

Subclass	Subgroup	Valid From
G08G	0001/0967	01/01/2006



Application No: GB1221569.5

Examiner: Ms Amanda Mason

Claims searched: 5

Date of search: 11 September 2013

Patents Act 1977

Further 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	5	DE10248968 A1 (DEUTSCHE TELEKOM) See Figure 1, EPODOC and WPI abstracts and paragraphs [0008], [0012]-[0013]
X	5	US2005/280552 A1 (DIPIAZZA) See paragraphs [0005], [0012]-[0016], [0034]-[0035]
X	5	US4816827 A (BALOUTCH) See Figs.1-2; WPI abstract; column 2, lines 5-9
X	5	FR2620253 A1 (BALOUTCH) See Figs.1-4; EPODOC abstract
X	5	EP1422678 A2 (FRANCE TELECOM) See Fig.2; WPI abstract; paragraph [0059]

Categories:

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&	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.

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Worldwide search of patent documents classified in the following areas of the IPC

B60K; B60T; G08G

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

International Classification:

Subclass	Subgroup	Valid From
G08G	0001/0967	01/01/2006