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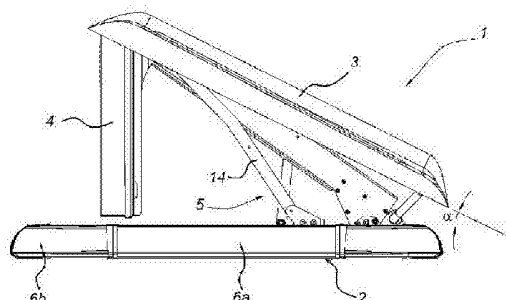
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**Traffic display system.**

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Traffic display system having a mounting frame (2), a closing lid (3), and a display (4). The closing lid (3) and the display (4) are mounted to the mounting frame (2) by an actuator assembly (5), the actuator assembly (5) being operative to move the closing lid (3) and the display (4) between a closed position and an operational position. The traffic display system further comprising one or more optical signaling lights (6) integrated into the mounting frame (2).



## Traffic display system

### **Field of the invention**

5 The present invention relates to a traffic display system, comprising a mounting frame, a closing lid, and a display.

### **Prior art**

German patent publication DE-C-43 12 421 discloses a road traffic warning and guidance device, using an optical projection device and a projection screen in a roof  
10 mounted assembly. The roof mounted assembly can be raised from a closed resting position to an open operative position by extending a closing lid.

European patent publication EP-A-0 362 608 discloses a warning light device having a directional warning panel to regulate traffic. The warning light device is mountable to the rear roof part of a vehicle and is able to display traffic symbols using  
15 an optical fiber display matrix.

### **Summary of the invention**

The present invention seeks to provide an improved and easy to use traffic display system, with additional functionality compared to prior art systems.

20 According to the present invention, a traffic display system according to the preamble defined above is provided, wherein the closing lid and the display are mounted to the mounting frame by an actuator assembly, the actuator assembly being operative to move the closing lid and the display between a closed position and an operational position, the traffic display system further comprising one or more optical  
25 signaling lights integrated into the mounting frame. This provides a traffic display system which is easy to use and to install on a vehicle. The optical signaling lights integrated into the mounting frame obviate the need for a separate installation of signaling lights on the vehicle.

Further exemplary and advantageous embodiments are described in the  
30 appended claims, and details thereof are described in further detail in the description of the figures below.

### Short description of drawings

The present invention will be discussed in more detail below, using a number of exemplary embodiments, with reference to the attached drawings, in which

Fig. 1 shows a top view of an embodiment of a traffic display system according to the present invention;

Fig. 2 shows a side view of the traffic display system shown in Fig. 1 in a closed position;

Fig. 3 shows a front view of the traffic display system shown in Fig. 1 in a closed position;

Fig. 4 shows a side view of the traffic display system of Fig. 1 in an operational position;

Fig. 5 shows a front view of the traffic display system of Fig. 1 in an operational position;

Fig. 6A shows a side view of an actuator assembly as used in an exemplary embodiment of the traffic display system of the present invention;

Fig. 6B shows a perspective view of the actuator assembly shown in Fig. 6A;

Fig. 7 shows a cross sectional side view of an embodiment of the present invention traffic display system; and

Fig. 8 shows a schematic diagram of a control system of the traffic display system according to an embodiment of the present invention.

### Detailed description of exemplary embodiments

Traffic display systems are widely used, e.g. known as dynamic route information panels (DRIP) or variable message signs (VMS), for providing information to users of roads etc. Such systems are also known in mobile versions, which are e.g. mounted onto a vehicle or implemented as a separate mobile (towable) vehicle. Furthermore, such vehicles are often fitted with further signaling indicators, including visual markings and/or signaling lights.

The present invention embodiments relate to a traffic display system 1 which is mountable to a vehicle, e.g. to the roof of a vehicle in an easy and straightforward manner. This is achieved by providing a traffic display system, comprising a mounting frame 2, a closing lid 3, and a display 4 moveable between a resting position and an operable position. The display 4 and the closing lid 3 are mounted to the mounting

frame 2 by an actuator assembly 5. Furthermore, one or more optical signaling lights 6 are integrated into the mounting frame 2.

As shown in the top view in Fig. 1 of an exemplary embodiment of the traffic display system 1, a closing lid 3 is provided covering most of the mounting frame 2, but leaving visible four side sections 6a and four corner sections 6b of the mounting frame, each of the side sections 6a and corner sections 6b providing space for the one or more optical signaling lights 6 and/or further devices. [text claim 9] Fig. 2 shows a side view of the traffic display system 1, showing a side section 6a and two corner sections 6b of the mounting frame 2. Fig. 3 shows a front view of the traffic display system 1, showing again a side section 6a and two corner sections 6b of the mounting frame 2. In the closed position of the traffic display system 1 of Fig. 1-3, the actuator assembly 5 is not visible, as the closing lid 3 neatly covers all the elements of the actuator assembly 5. The closing lid 3 in combination with the mounting frame 2 provide a low profile cross section in the closed position, with only a low impact on the drag coefficient of the vehicle on which the traffic display system 1 is mounted.

Fig. 4 shows a side view of the traffic display system 1 in an operational position, wherein the display 4 is positioned upright, and wherein the closing lid 3 is at an angle  $\alpha$  to the horizontal plane. To transition from a closed position to an operational position, the actuator assembly 5 in a further embodiment comprises an opening actuator part having mechanical links 11-23 connected to the closing lid 3 and the display 4. These mechanical links 11-23 (one link arm 14 being shown in Fig. 4) comprise a plurality of push rods, lifting arms, and/or rotating/journaling mechanisms, etc., as will be explained below with reference to Fig. 6A and 6B. The mechanical links connected to the closing lid 3 are arranged to hold the closing lid 3 at a predetermined angle  $\alpha$  to a main surface of the mounting frame 2 in a specific embodiment. This allows to maintain an aerodynamic profile, enhancing the ability to operate the vehicle up to a high speed (e.g. 130km/h, possibly combined with a (cross) wind component of as much as 50 km/h, thus a total wind speed of up to 180 km/h) when the display 4 is in its operational position (i.e. extended).

The display 4 is a matrix display in an embodiment, e.g. a color matrix display, which is thus able to shown traffic sign graphics, as well as text messages. The one or more optical signaling lights 6 may comprise one or more of: a strobe light, a flash light, a warning light, a traffic indicator light, a search light. In general any possible

signaling light 6 may be provided in the spaces provided by the side sections 6a and/or corner section 6b of the mounting frame 2. Furthermore, the side sections 6a and/or corner sections 6b each may be fitted with similar optical signaling lights 6, or with a combination of different (or none) optical signaling lights 6. The front side view of Fig. 5 shows the traffic display system 1 in its operational position, with two of the corner sections 6b of the mounting frame 2, one side section 6a of the mounting frame 2, and the face of the display 4 facing towards upcoming traffic.

It is noted that in the closed position, as is shown in the side and front view of Fig. 2 and 3, a front side of the display 4 is parallel to a main surface of the mounting frame 2 in the closed position, providing an efficient protection of the front side of the display 4. Especially, the front side of the display is facing downward in an advantageous embodiment, i.e. directed to the roof top of the vehicle on which the traffic display system 1 is mounted.

In a further embodiment of the present invention, the actuator assembly 5 is further arranged to rotate the display 4 in its operating position along an axis 7 substantially perpendicular to a main surface of the mounting frame 2 (see the side view of the actuator assembly 5 of Fig. 6A and the cross sectional view of Fig. 7). This allows to point the front face of the display 4 towards oncoming traffic, independent from the direction in which the vehicle is pointing onto which the traffic display system 1 is mounted. The amount of rotation may be limited to e.g. +/- 50 degrees, which allows to correctly and safely position the vehicle on the road and still aim the display 4 at oncoming traffic.

In a further embodiment, see the side view of Fig. 6A and cross sectional view of Fig. 7, the actuator assembly 5 further comprises a bearing 25 and a rotation actuator 25a connected to the mounting frame 2 and to the actuator assembly 5 (and thus indirectly to the display 4). The actuator assembly 5 is then the single element connecting the display 4 and the closing lid 3 to the mounting frame 2, making the traffic display system 1 very efficient to build and reliable in operation.

The operation of the actuator assembly 5 will now be explained with reference to the side view of Fig. 6A, the perspective view of Fig. 6B, and the cross sectional view of the entire traffic display system 1 of Fig. 7.

The actuator assembly 5 is a combination of mechanical links, i.e. push rods, lifting arms, rotating/journaling mechanism etc. which are operated by a single actuator

11. The actuator 11 is fixed onto a secondary base plate 21, which is journaled on axis 20 for connection to a primary base plate 12. The primary base plate 12 is fixedly attached to the bearing 25, which (see Fig. 7) is connected to the mounting frame 2.

The closing lid 3 is attached to the actuator assembly 5 on one side using a  
 5 lifting link 23, which is attached rotatable to the primary base plate 12 via a bearing 22. On the other side, the closing lid 3 is attached to a distal end of secondary lifting arms 14 (via pivot axis 15).

The display 4 is attached to the actuator assembly 5 using the display  
 attachment arms 16. The attachment arms 16 can pivot around first pivot axis 15 at the  
 10 distal end of the secondary lifting arms 14, as well as around second pivot axis 16a of a distal connector plate 23. Distal connector plate 23 is connected to the actuator 11 via two connecting rods 24a, 24b, of which the distal connecting rod 24b is e.g. implemented as a damper spring for extending the display 4 to its vertical position. At the interconnection of the two connecting rods 24a, 24b, two sliders 19 (e.g.  
 15 implemented as a trolley with wheels) are connected, which can slide in rails 18, which in turn are connected to a secondary base plate 21. Furthermore, two primary lifting arms 17 are connected to the sliders 19 at the same interconnection.

The primary lifting arms 17 and secondary lifting arms 14 are pivotally  
 connected to the primary base plate 12, at distinct proximal pivoting axes 13b, 13a,  
 20 respectively. The distance between primary pivoting axis 13b and secondary pivoting axis 13a, and the combination of the gliders 19 and rails 18 result in a lifting motion of the distal end of primary lifting arms 17 if the actuator 11 exerts a pulling force on the connecting rods 24a, 24b.

At the same time, the distance between first pivot axis 15 and second pivot axis  
 25 16a result in a rotating movement of the attachment arms 16 (and thus of display 4). By properly selecting the dimensions and shapes of all mechanical links 11-24b, the actuating assembly 5 is operable to move the closing lid 3 as well as the display 4 from a closed position to an operational position as shown in Fig. 7. In the closed position, the display 4 is then facing downward in the mounting frame 2, with the closing lid 3  
 30 down onto the mounting frame 2, providing protection against the environment of the entire traffic display system 1. In the operational position, the display 4 is upright and the closing lid at angle  $\alpha$ . If the actuator assembly 5 is arranged for rotation, the

combination of display 4 and closing lid 3 can rotate around axis 7 in the operational position.

In an alternative arrangement of the actuator assembly 5, a separate display actuator is provided to control the (vertical) orientation of the display 4, e.g. connected  
 5 between the primary lifting arm 17 and the attachment arms 16 (or directly to display 4). Such a separate display actuator would then be controlled together with the (main) actuator 11, and a number of elements as described in relation to the embodiment of Fig. 6A and 6B would be left out (e.g. secondary lifting arm 14).

In order to be able to rotate the display 4, the actuator assembly 5 as described  
 10 above comprises a bearing 25 and a rotation actuator 25a. In actual implementations the rotation actuator 25a is connected to the (fixed) mounting frame 2 on one side, and on the other side to a disc fixedly connected to the part of the bearing 25 which is in fixed relationship with the display 4 via the rest of the actuator assembly 5. In order to provide sufficient force to allow rotation of the display 4 (and closing lid 3), the  
 15 rotation actuator 25a can be implemented as multiple (e.g. two) series connected linear actuators.

A schematic diagram of a control system of the traffic display system 1 according to an embodiment of the present invention is shown in Fig. 8. A control unit 8 is provided which is connected to the display 4, the one or more optical signaling  
 20 lights 6 and the actuator assembly 5. The control unit 8 may be programmed to display the desired graphics or text messages on the display 4, and at the same time control e.g. warning lights 6 which are provided in the side or corner sections 6a, 6b of the mounting frame 2. The control unit 8 may comprise a user interface, e.g. remotely in the cabin of the vehicle on which the traffic display system is mounted. In a further  
 25 embodiment, a data communication interface 9 is provided which is connected to the control unit 8. The data communication interface 9 may be implemented as e.g. Wifi or Bluetooth interface, allowing connection to a mobile phone or remote computer system. This would allow easy and reliable remote operation of the traffic display system.

In even further alternative embodiments, further devices may be provided as  
 30 part of the traffic display system 1, which for control thereof may also be connected to the control unit 8 as shown in Fig. 8. Such a device may e.g. comprise at least one camera (e.g. with a pan, zoom, and/or tilt capability). Images of multiple cameras may

be stitched together or otherwise processed to provide a better situational awareness picture to the user of the traffic display system 1.

In one embodiment, the at least one camera is co-located with the display 4, allowing to provide a good view of oncoming traffic to which the display 4 is aimed. .

5 In addition, or alternatively, the at least one camera is positioned in the mounting frame 2, e.g. in one or more of the side or corner sections 6a, 6b. Using appropriate processing of the imagery data, this embodiment would be able to provide an all-around 360 degree view around the vehicle on which the traffic display system 1 is mounted.

10 The present invention as described above with reference to the exemplary embodiments as shown in the drawings can be summarized as the following numbered and interdependent embodiments:

Embodiment 1. Traffic display system, comprising a mounting frame (2), a closing lid (3) and a display (4),

15 wherein the closing lid (3) and the display (4) are mounted to the mounting frame (2) by an actuator assembly (5), the actuator assembly (5) being operative to move the closing lid (3) and the display (4) between a closed position and an operational position,

the traffic display system further comprising one or more optical signaling lights (6)  
20 integrated into the mounting frame (2).

Embodiment 2. Traffic display system according to embodiment 1, wherein the actuator assembly (5) comprises an opening actuator part having mechanical links (11-23) connected to the closing lid (3) and the display (4).

Embodiment 3. Traffic display system according to embodiment 2, wherein the  
25 mechanical links connected to the closing lid (3) are arranged to hold the closing lid (3) at a predetermined angle  $\alpha$  to a main surface of the mounting frame (2) in the operational position.

Embodiment 4. Traffic display system according to any one of embodiments 1-3, wherein the actuator assembly (5) is further arranged to rotate the display (4) in its  
30 operational position along an axis (7) substantially perpendicular to a main surface of the mounting frame (2).

Embodiment 5. Traffic display system according to embodiment 4, wherein the actuator assembly (5) further comprises a bearing (25) and a rotation actuator (25a) connected to the mounting frame (2) and to the display (4).

Embodiment 6. Traffic display system according to any one of embodiments 1-5, wherein a front side of the display (4) is parallel to a main surface of the mounting frame (2) in the closed position.

Embodiment 7. Traffic display system according to any one of embodiments 1-6, wherein the display (4) is a matrix display, e.g. a color matrix display.

Embodiment 8. Traffic display system according to any one of embodiments 1-7, wherein the one or more optical signaling lights (6) comprise one or more of: a strobe light, a flash light, a warning light, a traffic indicator light, a search light.

Embodiment 9. Traffic display system according to any one of embodiments 1-8, wherein the mounting frame (2) comprises four side sections (6a) and four corner sections (6b), each of the side sections (6a) and corner sections (6b) providing space for the one or more optical signaling lights (6) and/or further devices.

Embodiment 10. Traffic display system according to any one of embodiments 1-9, further comprising at least one camera.

Embodiment 11. Traffic display system according to embodiment 10, wherein the at least one camera is co-located with the display (4).

Embodiment 12. Traffic display system according to embodiment 10, wherein the at least one camera is positioned in the mounting frame (2).

Embodiment 13. Traffic display system according to any one of embodiments 1-12, further comprising a control unit (8) connected to the display (4), the one or more optical signaling lights (6) and the actuator assembly (5).

Embodiment 14. Traffic display system according to embodiment 13, further comprising a data communication interface (9) connected to the control unit (8).

The present invention embodiments have been described above with reference to a number of exemplary embodiments as shown in the drawings. Modifications and alternative implementations of some parts or elements are possible, and are included in the scope of protection as defined in the appended claims.

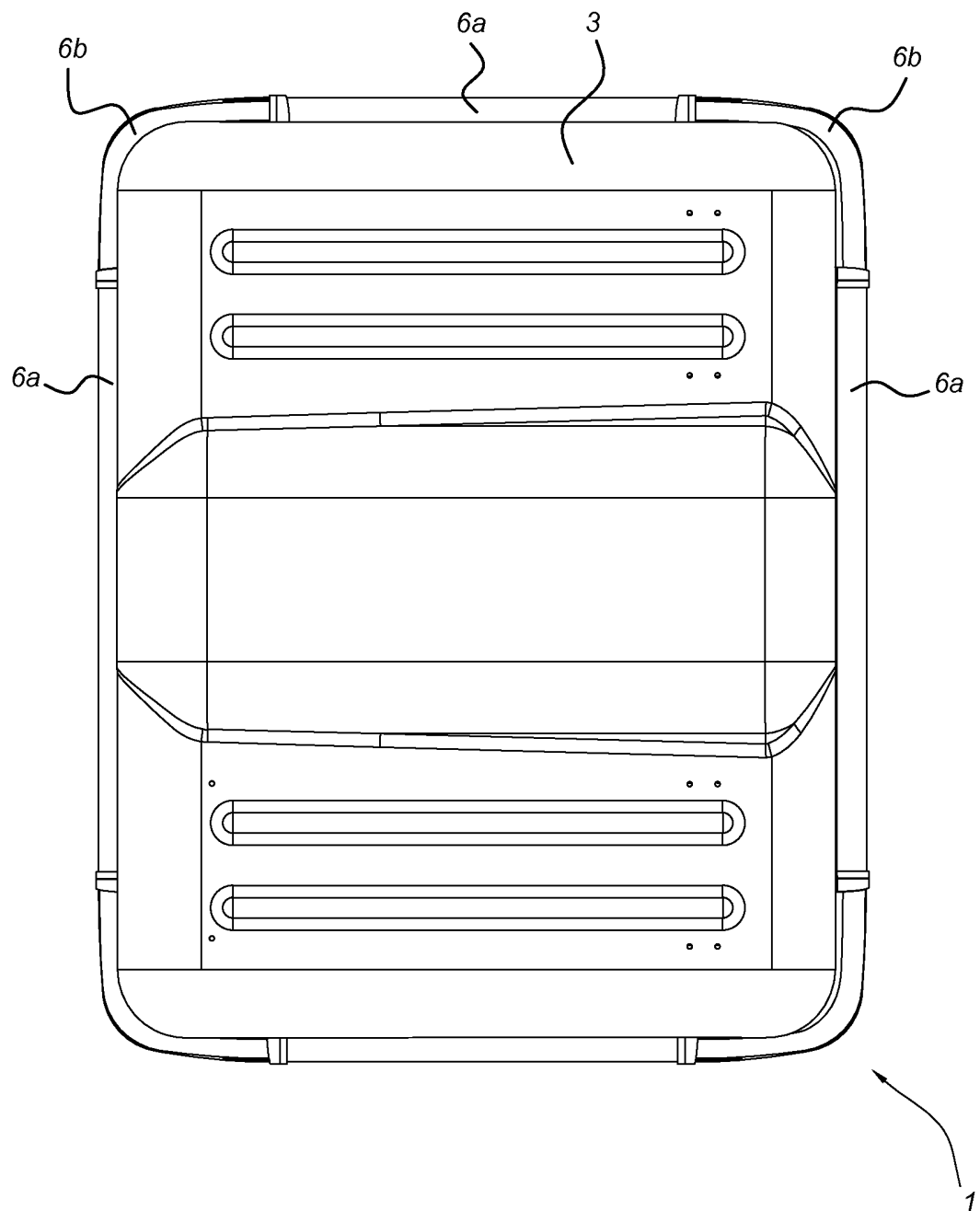
## CONCLUSIES

1. Verkeersdisplaysysteem, omvattende een bevestigingsraam (2), een afdekklep (3) en een display (4),  
5 waarbij de afdekklep (3) en het display (4) aan het bevestigingsraam (2) zijn bevestigd door een actuatorsamenstel (5), waarbij het actuatorsamenstel (5) werkzaam is om de afdekklep (3) en het display (4) te bewegen tussen een gesloten toestand en een operationele toestand,  
en het verkeersdisplaysysteem verder één of meer optische-signaallichten (6) omvat die  
10 geïntegreerd zijn in het bevestigingsraam (2).
  
2. Verkeersdisplaysysteem volgens conclusie 1, waarbij het actuatorsamenstel (5) een openend actuatordeel omvat met mechanische verbindingen (11-23) die verbonden zijn met de afdekklep (3) en het display (4).  
15
  
3. Verkeersdisplaysysteem volgens conclusie 2, waarbij de mechanische verbindingen die verbonden zijn met de afdekklep (3) zijn ingericht om de afdekklep (3) op een vooraf bepaalde hoek  $\alpha$  met een hoofdvlak van het bevestigingsraam (2) te houden in de operationele toestand.  
20
  
4. Verkeersdisplaysysteem volgens één van de conclusies 1-3, waarbij het actuatorsamenstel (5) verder is ingericht om het display (4) in zijn operationele toestand to roteren over een as (7) die in hoofdzaak loodrecht ligt op en hoofdvlak van het bevestigingsraam (2).  
25
  
5. Verkeersdisplaysysteem volgens conclusie 4, waarbij het actuatorsamenstel (5) verder een lager (25) en een rotatie-actuator (25a) omvat die verbonden zijn met het bevestigingsraam (2) en met het display (4).
  
- 30 6. Verkeersdisplaysysteem volgens één van de conclusies 1-5, waarbij een voorzijde van het display (4) parallel ligt aan een hoofvlak van het bevestigingsraam (2) in de gesloten toestand.

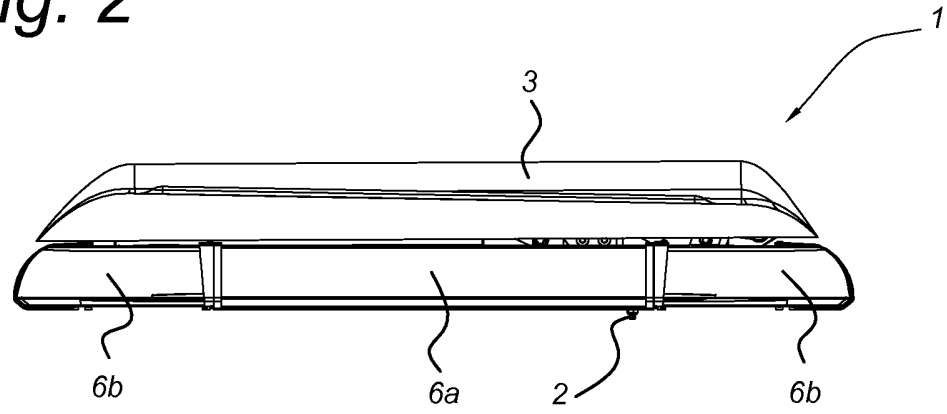
7. Verkeersdisplaysysteem volgens één van de conclusies 1-6, waarbij het display (4) een matrixdisplay is, bijvoorbeeld een kleurenmatrixdisplay.
8. Verkeersdisplaysysteem volgens één van de conclusies 1-7, waarbij de één of  
5 meer optische-signaallichten (6) één of meer omvatten van: een stroboscooplicht, een flitslicht, een waarschuwingslicht, een verkeersindicatorlicht, een zoeklicht.
9. Verkeersdisplaysysteem volgens één van de conclusies 1-8, waarbij het bevestigingsraam (2) vier zijsecties (6a) en vier hoeksecties (6b) omvat, waarbij elk van  
10 de zijsecties (6a) en hoeksecties (6b) ruimte verschaffen voor de één of meer optische-signaallichten (6) en/of verder inrichtingen.
10. Verkeersdisplaysysteem volgens één van de conclusies 1-9, verder omvattende ten minste één camera.  
15
11. Verkeersdisplaysysteem volgens conclusie 10, waarbij de ten minste ene camera samen geplaatst is met het display (4).
12. Verkeersdisplaysysteem volgens conclusie 10, waarbij de ten minste ene camera  
20 gepositioneerd is in het bevestigingsraam (2).
13. Verkeersdisplaysysteem volgens één van de conclusies 1-12, verder omvattende een besturingseenheid (8) die verbonden is met het display (4), de één of meer optische-signaallichten (6) en het actuatorsamenstel (5).  
25
14. Verkeersdisplaysysteem volgens conclusie 13, verder omvattende een datacommunicatie-interface (9) die verbonden is met de besturingseenheid (8).

\*\*\*\*\*

*Fig. 1*



*Fig. 2*



*Fig. 3*

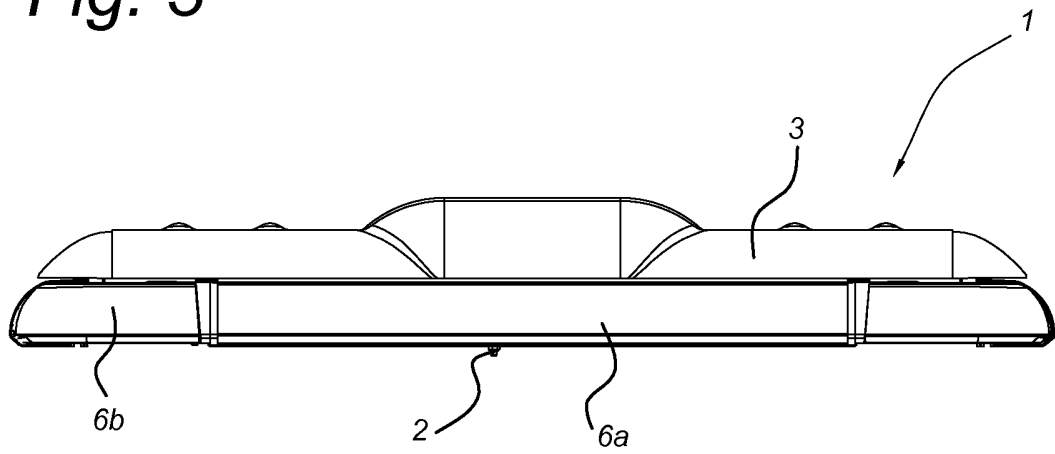


Fig. 4

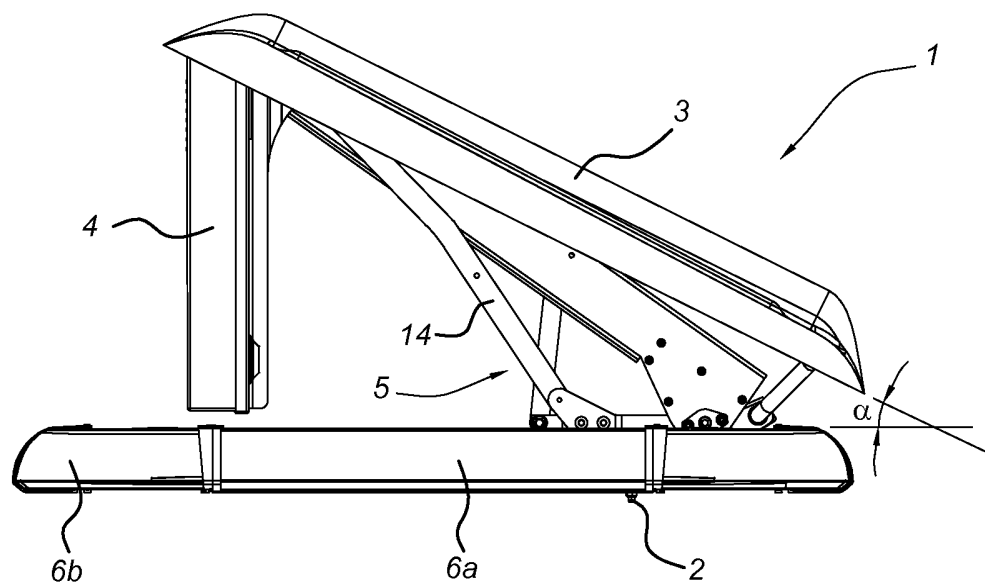


Fig. 5

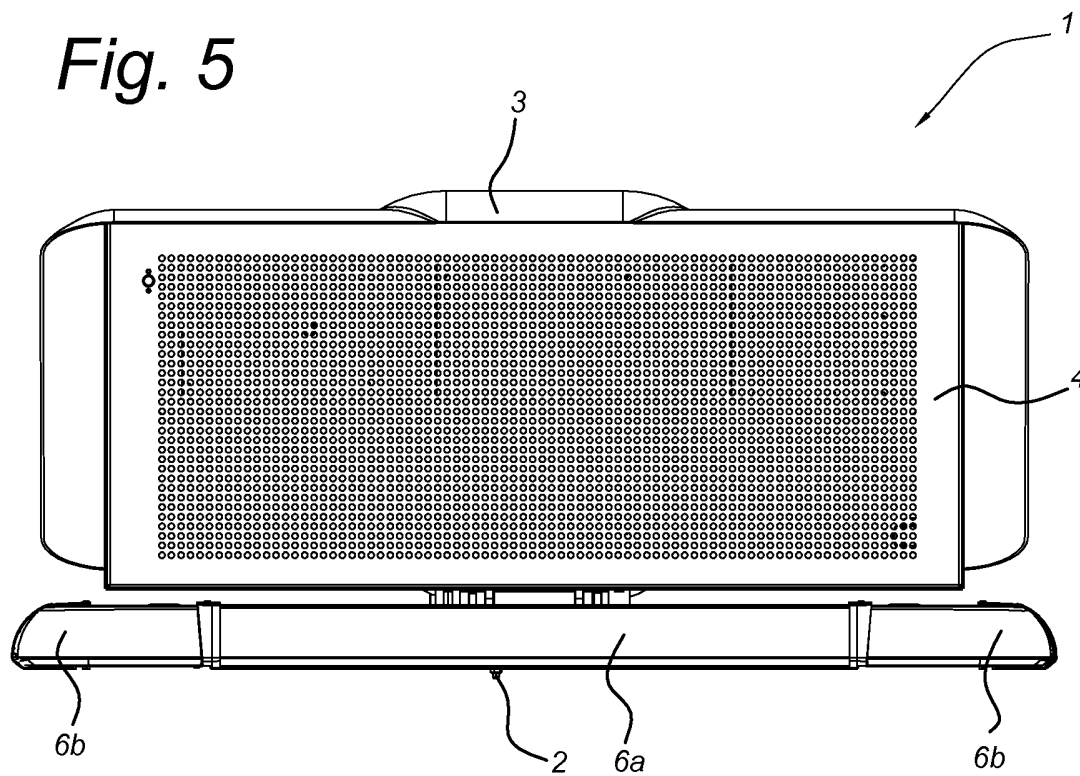


Fig. 6A

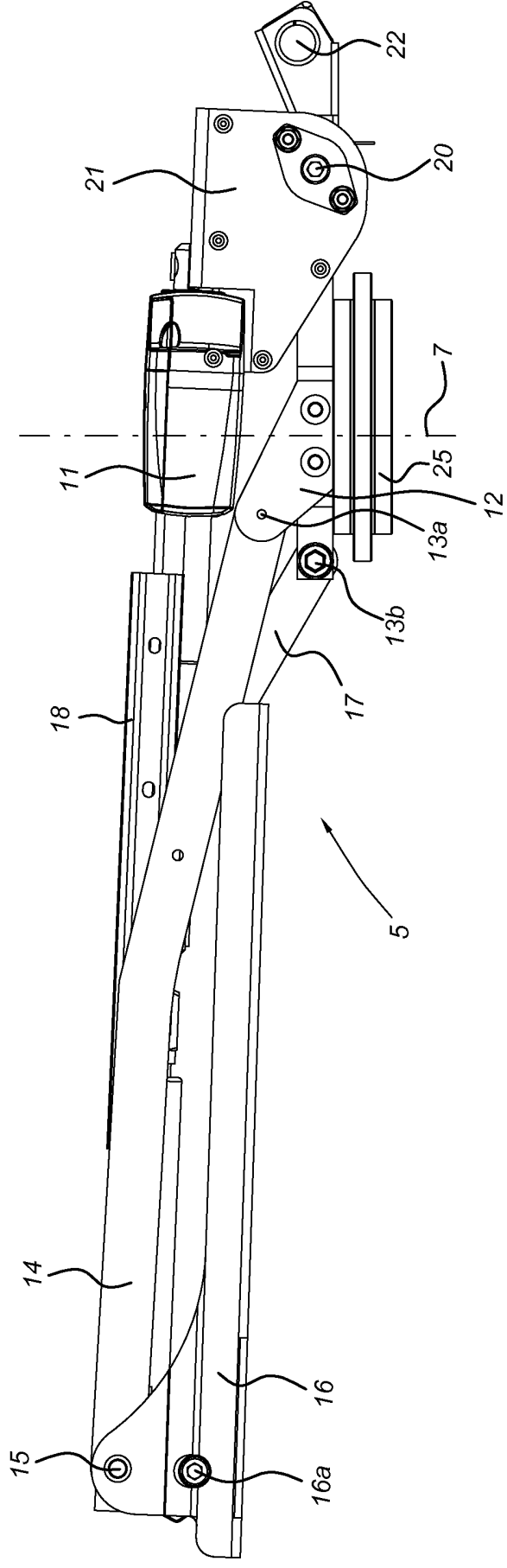
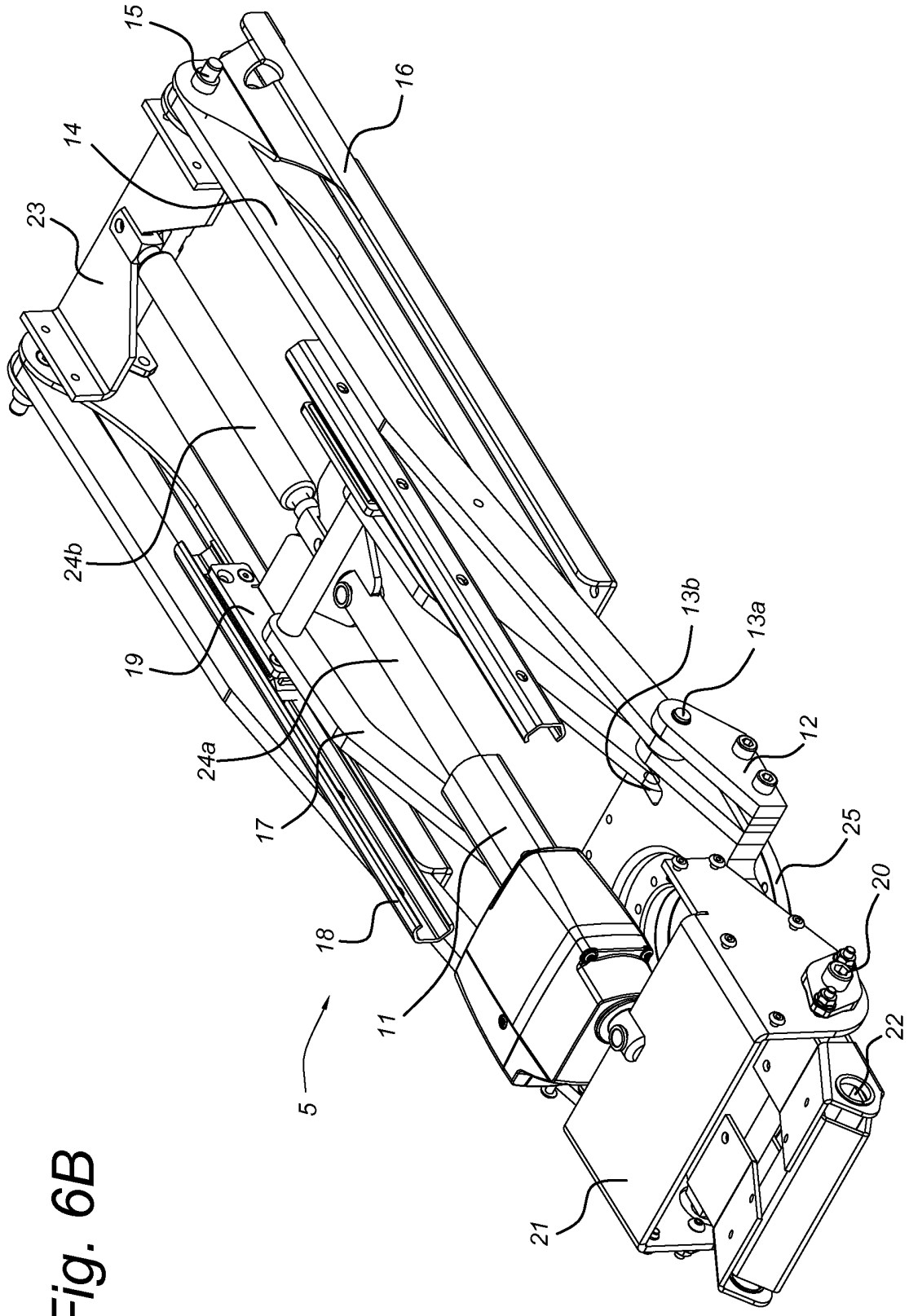
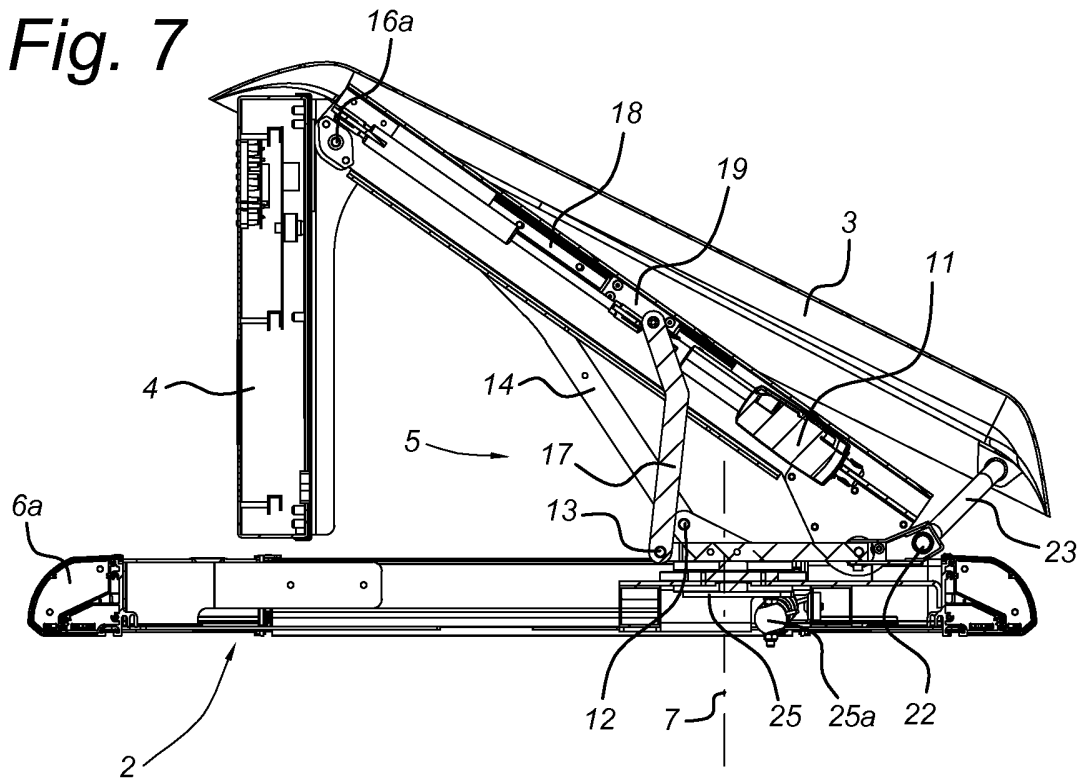


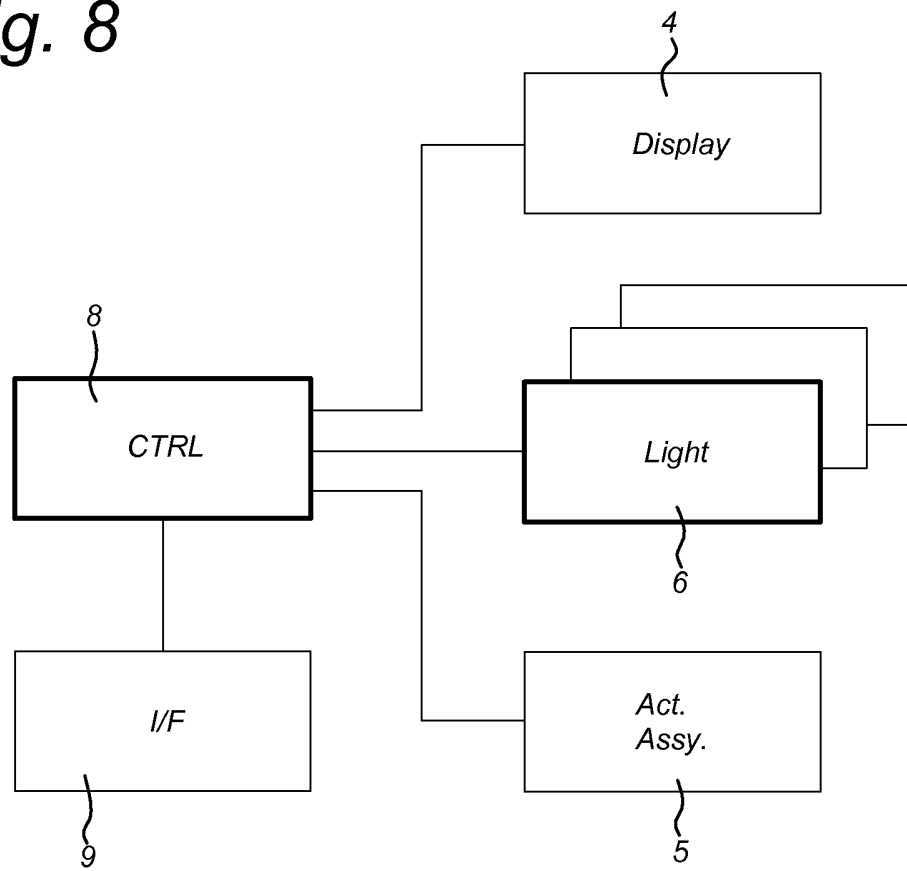
Fig. 6B



*Fig. 7*



*Fig. 8*



ABSTRACT

Traffic display system having a mounting frame (2), a closing lid (3), and a display (4). The closing lid (3) and the display (4) are mounted to the mounting frame (2) by an  
5 actuator assembly (5), the actuator assembly (5) being operative to move the closing lid (3) and the display (4) between a closed position and an operational position. The traffic display system further comprising one or more optical signaling lights (6) integrated into the mounting frame (2).

10 [Fig. 4]

## SAMENWERKINGSVERDRAG (PCT)

### RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                        |                             |                              |            |                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|------------|-------------------------------------------|
| <b>IDENTIFICATIE VAN DE NATIONALE AANVRAGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE</b><br><br><div style="text-align: center;"><b>P6060928NL</b></div>                                                                  |                             |                              |            |                                           |
| Nederlands aanvraag nr.<br><br><div style="text-align: center;"><b>2016533</b></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Indieningsdatum<br><br><div style="text-align: center;"><b>01-04-2016</b></div>                                                                                                        |                             |                              |            |                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Ingeroepen voorrangsdatum                                                                                                                                                              |                             |                              |            |                                           |
| Aanvrager (Naam)<br><br><div style="text-align: center;"><b>TTI Partners B.V.</b></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                        |                             |                              |            |                                           |
| Datum van het verzoek voor een onderzoek van internationaal type<br><br><div style="text-align: center;"><b>27-08-2016</b></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.<br><br><div style="text-align: center;"><b>SN 67142</b></div> |                             |                              |            |                                           |
| <b>I. CLASSIFICATIE VAN HET ONDERWERP</b> (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)<br>Volgens de internationale classificatie (IPC)<br><br><div style="display: flex; justify-content: space-around; text-align: center;"> <span><b>E01F9/662</b></span> <span><b>B60Q1/26</b></span> <span><b>G09F21/04</b></span> </div>                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                        |                             |                              |            |                                           |
| <b>II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK</b><br><div style="text-align: center; border-bottom: 1px solid black; margin-bottom: 5px;">Onderzochte minimumdocumentatie</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center; vertical-align: top;"> <b>Classificatiesysteem</b> </td> <td style="text-align: center; vertical-align: top;"> <b>Classificatiesymbolen</b> </td> </tr> <tr> <td style="text-align: center; vertical-align: top;"> <b>IPC</b> </td> <td style="text-align: center; vertical-align: top;"> <b>E01F      B60Q      G08G      G09F</b> </td> </tr> </table> |                                                                                                                                                                                        | <b>Classificatiesysteem</b> | <b>Classificatiesymbolen</b> | <b>IPC</b> | <b>E01F      B60Q      G08G      G09F</b> |
| <b>Classificatiesysteem</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Classificatiesymbolen</b>                                                                                                                                                           |                             |                              |            |                                           |
| <b>IPC</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>E01F      B60Q      G08G      G09F</b>                                                                                                                                              |                             |                              |            |                                           |
| Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen<br><br><div style="height: 40px;"></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                        |                             |                              |            |                                           |
| <b>III.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> <b>GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES</b> (opmerkingen op aanvullingsblad)                                                                      |                             |                              |            |                                           |
| <b>IV.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <input type="checkbox"/> <b>GEBREK AAN EENHEID VAN UITVINDING</b> (opmerkingen op aanvullingsblad)                                                                                     |                             |                              |            |                                           |

**ONDERZOEKSRAPPORT BETREFFENDE HET  
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND  
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar  
de stand van de techniek

NL 2016533

A. CLASSIFICATIE VAN HET ONDERWERP  
INV. E01F9/662 B60Q1/26 G09F21/04  
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

**B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK**

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)

E01F B60Q G08G G09F

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal, WPI Data

**C. VAN BELANG GEACHTE DOCUMENTEN**

| Categorie * | Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages                                                        | Van belang voor<br>conclusie nr. |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| X           | US 2007/197084 A1 (DAROLFI RINALDO [CA] ET AL) 23 augustus 2007 (2007-08-23)<br>* alineas [0056] - [0074]; figuren 1-11 *                      | 1-3,6-14                         |
| X           | US 8 638 209 B1 (OSKROBA SHAUN [US] ET AL) 28 januari 2014 (2014-01-28)<br>* kolom 3, regels 7-19 *<br>* kolom 6, regels 33-64; figuren 5-15 * | 1,2,4-8,<br>10-14                |
| A           | US 2009/256697 A1 (TALLINGER GERALD G [US]) 15 oktober 2009 (2009-10-15)<br>* alineas [0049] - [0052], [0064];<br>figuren 4A,4B,12 *           | 1-14                             |

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

**\* Speciale categorieën van aangehaalde documenten**

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwaarlijk is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"Z" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

9 december 2016

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
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De bevoegde ambtenaar

Flores Hokkanen, P

**ONDERZOEKSRAPPORT BETREFFENDE HET  
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND  
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar  
de stand van de techniek

NL 2016533

| In het rapport<br>genoemd octrooigecchrift | Datum van<br>publicatie | Overeenkomend(e)<br>geschrift(en) | Datum van<br>publicatie |
|--------------------------------------------|-------------------------|-----------------------------------|-------------------------|
| US 2007197084                              | A1                      | 23-08-2007                        | GEEN                    |
| US 8638209                                 | B1                      | 28-01-2014                        | GEEN                    |
| US 2009256697                              | A1                      | 15-10-2009                        | GEEN                    |

## WRITTEN OPINION

|                                                                                |                                            |                                |                              |
|--------------------------------------------------------------------------------|--------------------------------------------|--------------------------------|------------------------------|
| File No.<br>SN67142                                                            | Filing date (day/month/year)<br>01.04.2016 | Priority date (day/month/year) | Application No.<br>NL2016533 |
| International Patent Classification (IPC)<br>INV. E01F9/662 B60Q1/26 G09F21/04 |                                            |                                |                              |
| Applicant<br>TTI Partners B.V.                                                 |                                            |                                |                              |

This opinion contains indications relating to the following items:

- ☒ Box No. I      Basis of the opinion
- ☐ Box No. II      Priority
- ☐ Box No. III      Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV      Lack of unity of invention
- ☒ Box No. V      Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI      Certain documents cited
- ☐ Box No. VII      Certain defects in the application
- ☐ Box No. VIII      Certain observations on the application

|  |                                |
|--|--------------------------------|
|  | Examiner<br>Flores Hokkanen, P |
|--|--------------------------------|

## WRITTEN OPINION

Application number  
NL2016533

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### Box No. I Basis of this opinion

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1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing:
    - ☐ contained in the application as filed.
    - ☐ filed together with the application in electronic form.
    - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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### Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

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#### 1. Statement

|                          |             |             |
|--------------------------|-------------|-------------|
| Novelty                  | Yes: Claims | 4, 5, 10-14 |
|                          | No: Claims  | 1-3, 6-9    |
| Inventive step           | Yes: Claims |             |
|                          | No: Claims  | 1-14        |
| Industrial applicability | Yes: Claims | 1-14        |
|                          | No: Claims  |             |

#### 2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- 1 Reference is made to the following documents:  

|     |                   |
|-----|-------------------|
| D1: | US 2007/197084 A1 |
| D2: | US 8 638 209 B1   |
- 2 The present application does not meet the criteria of patentability, because the subject-matter of claim 1 is not new.  
D1 discloses (see in particular [0056]-[0063] and figures 3, 5):
- 3 Verkeersdisplaysysteem 10 ("signalling device"), omvattende een bevestigingsraam 18 ("lower housing portion"), een afdekklep 34 ("upper panel") en een display 16b, 44, waarbij de afdekklep en het display aan het bevestigingsraam zijn bevestigd door een actuatorsamenstel 22 ("transfer portion"), waarbij het actuatorsamenstel werkzaam is om de afdekklep en het display te bewegen tussen een gesloten toestand (fig. 5) en een operationele toestand (fig. 3), en het verkeersdisplaysysteem verder één of meer optische-sigitaallichten 44,44b omvat die geïntegreerd zijn in het bevestigingsraam 18.
- 3.1 In fact, in claim 1 it is not further precised how the closing lid and the display are placed or arranged to each other. In D1, they are attached to each other sharing a main plane surface.
- 4 Dependent claims 2-14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty or inventive step.
  - Regarding claim 2, D1 (for example fig. 3) discloses the actuator assembly with an opening actuator part 60. The actuator part is regarded as having mechanical links connected to the closing lid 34 and the display 16b due to the fact that closing lid and display are attached to each other.
  - Regarding claim 3, D1 in fig. 10 (see also par. [0063]) discloses the closing lid 34 at a predetermined angle "theta" to a main surface of the mounting frame 18.
  - Regarding claim 4, D2 (col. 3, lines 7-19; figures 5, 6) discloses a display system having a mounting frame 104, a closing lid 30 and a display mounted to the frame by an actuator assembly 151. The actuator assembly moves the lid (together with the display) between a closed (fig. 5) and an operational (fig. 6) position. The actuator assembly 151 allows a rotation 107 of the display

along the axis 108. Further, D2 in fig. 15 discloses the display system mounted on the back surface 22 of a truck body, so that it is considered obvious for the skilled person to provide further signaling lights on the mounting frame 104 so to be seen by vehicles driving behind the truck.

- Regarding claim 5, in D2 (figures 7, 8) the actuator assembly includes a rotation mechanism 166 with corresponding bearing and actuator.
- Regarding claim 6, in D1 (fig. 5) and D2 (fig. 5) the display is parallel to a main surface of the mounting frame in closed position.
- Regarding claim 7, the displays in D1 and D2 can be regarded as being matrix displays.
- Regarding claim 8, to provide in D1 a particular signaling light 44, 44b is regarded as a minor constructional modification, obvious for the skilled person.
- Regarding claim 9, in D1 (fig. 3) the mounting frame 18 comprises side 26 and corner sections.
- Claims 10-14 refer to additional features as a camera, control unit and interface, which are all regarded as minor constructional modifications, obvious for the skilled person.