

EUROPEAN QUALIFYING EXAMINATION 2016

Paper B(E/M)

Electricity / Mechanics

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Description of the Application

[001] The present invention relates to a warning system for a driveway crossing. A driveway can be an exit from a building, a property or a garage, or it can be an alleyway in a city. A driveway crossing is the area where the driveway accesses a public road. It normally includes a pavement for pedestrians that must be driven over by a vehicle exiting from the driveway in order to reach the road.

[002] When the vehicle exits from the driveway, the driver's view may be obstructed by buildings or vegetation. Thus, the driver might not see pedestrians approaching on the pavement. The decreased visibility can be stressful for the driver, especially if the road onto which the driveway opens is busy.

[003] The prior art D1 describes warning lights for warning pedestrians of vehicles at a driveway crossing. A disadvantage of this system is that the driver of the vehicle must rely on the behaviour of the pedestrians. The warning lights are not configured to warn the driver that a pedestrian is crossing his path. Rather, the driver himself must be attentive and give way to the pedestrians.

[004] The aim of the invention is to further increase safety at driveway crossings.

[005] The invention relates to a warning system for a driveway crossing according to claim 1. The invention further concerns a warning pole comprising such a warning system.

[006] Brief description of the drawings:

Fig. 1 shows a first embodiment of the invention;

Fig. 2 shows a second embodiment of the invention.



[007] Fig. 1 shows a first embodiment, where the driveway 1 is an exit for vehicles from a building. A vehicle exiting from the driveway 1 has to drive over the pavement 2 at the driveway crossing 3 in order to reach the road. Since the driver's view is obstructed by the parts of the building at both sides of the driveway 1, a warning system is provided that helps the driver drive safely over the pavement 2.

[008] A driveway sensor in the form of a weight sensor 4 is integrated in the floor of the driveway 1 for detecting a vehicle in the driveway. The weight sensor 4 is connected to a control unit 5. A display means in the form of an LCD screen 6 is provided to give a warning signal to the driver in the driveway 1. The LCD screen 6 is connected to the control unit 5. Pavement sensors in the form of optical sensors 7 and 8 are placed at each side of the driveway crossing 3 for detecting approaching pedestrians on the pavement 2. Preferably, the optical sensors 7 and 8 are photoelectric cells. The optical sensors 7 and 8 are connected to the control unit 5. In order to provide a compact system, the control unit 5 can be an integral component of the LCD screen 6.

[009] Preferably, the warning system comprises a display panel 9. The display panel 9 is mounted above the pavement 2 close to the driveway crossing 3. The display panel 9 is connected to the weight sensor 4 through the control unit 5. The display panel 9 is configured to light up in order to warn pedestrians that a vehicle is exiting from the driveway 1. The message on the display panel 9 may be visible from both sides thereof.

[010] Instead of an LCD screen 6, the display means can be a traffic light. The detection of a pedestrian on the pavement 2 is in that case indicated to the driver in the driveway 1 by the red light of the traffic light. This provides a clear and familiar warning signal to the driver.



[011] The operation of the warning system is as follows. A vehicle exiting from the driveway 1 and approaching the driveway crossing 3, drives over the weight sensor 4. In response to the output of the weight sensor 4, the control unit 5 activates the optical sensors 7 and 8, which are now able to detect approaching pedestrians on the pavement 2. A pedestrian approaching the driveway crossing 3 is detected by either of the optical sensors 7 and 8. In response to the output of the optical sensors 7 and 8, the control unit 5 causes the LCD screen 6 to give a warning signal, so that the driver is informed of possible danger at the driveway crossing 3. The control unit 5 ensures that the optical sensors 7 and 8 are activated only when the weight sensor 4 detects a vehicle in the driveway 1. This avoids unnecessary activation of the components of the warning system and therefore reduces the electricity consumption of the warning system. In response to the output of the weight sensor 4, the control unit 5 may also light up the display panel 9 above the pavement 2 in order to warn the pedestrians of the approaching vehicle.

[012] Fig. 2 shows a second embodiment, where the driveway 11 is the exit from a property. The driveway crossing 13 connects the driveway 11 to the road. Vegetation near the driveway crossing 13 obstructs the view of a driver exiting from the driveway 11. A warning pole 20 is placed at the corner of the driveway crossing 13. The warning pole 20 comprises a driveway sensor 14 for detecting a vehicle in the driveway 11. Furthermore, the warning pole 20 comprises a pavement sensor 17 for detecting pedestrians on the pavement 12. Preferably, both the driveway sensor 14 and the pavement sensor 17 are optical sensors. The warning pole 20 also comprises a display panel 16 connected to the pavement sensor 17. The warning pole 20 further comprises a control unit (not shown) that activates the pavement sensor 17 in response to the output of the driveway sensor 14, in the same manner as described with respect to the first embodiment. That is, the pavement sensor 17 is activated only when the driveway sensor 14 detects a vehicle. Therefore, unnecessary activation of the components of the warning system is avoided and the electricity consumption of the warning system is reduced. In response to the output of the pavement sensor 17, the control unit causes the display panel 16 to give a warning signal, so that the driver is informed of possible danger at the driveway crossing 13.

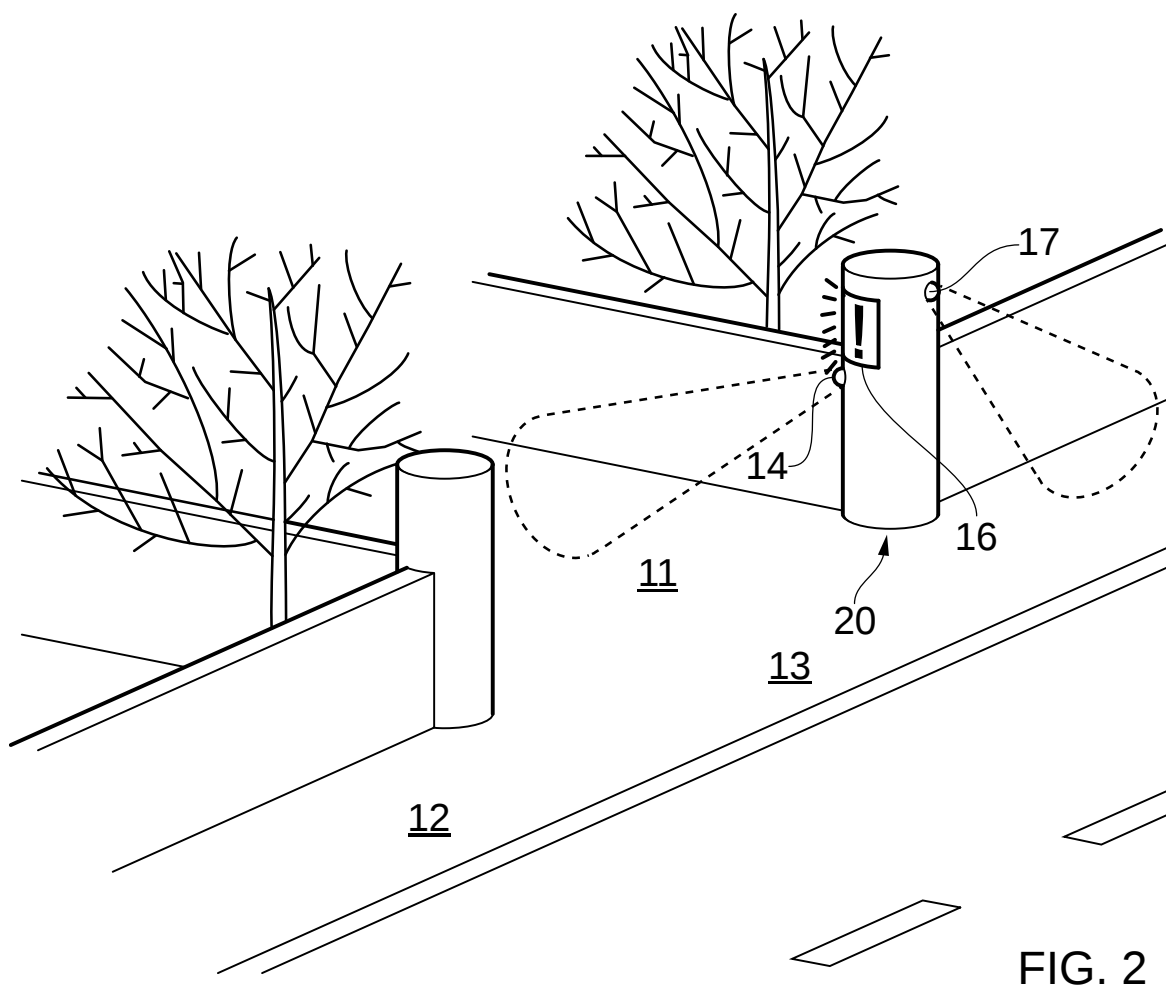
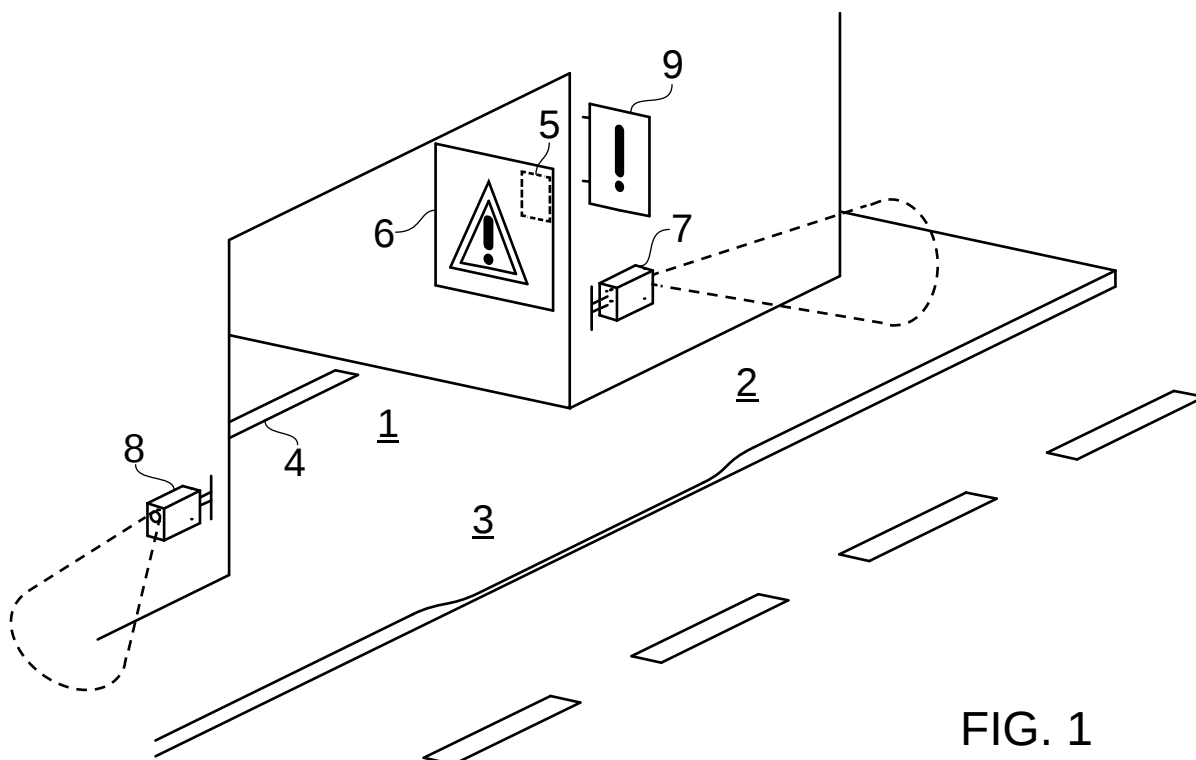


Claims

1. Warning system for a driveway crossing (3,13), comprising:
 - a control unit (5),
 - a pavement sensor (7, 8, 17) connected to the control unit (5) and configured to detect pedestrians on a pavement (2, 12) approaching the driveway crossing (3, 13), and
 - a first display means (6, 16) connected to the control unit (5),the control unit (5) being configured so that the first display means (6, 16) gives a warning signal to the driver of a vehicle in the driveway (1, 11) in response to the output of the pavement sensor (7, 8, 17).
2. Warning system according to claim 1, comprising:
 - a driveway sensor (4, 14) configured to detect a vehicle in the driveway (1, 11) approaching the driveway crossing (3, 13), and
 - a second display means (9) configured to warn pedestrians on the pavement (2, 12) that a vehicle is exiting from the driveway (1,11).
3. Warning system according to any of the previous claims, wherein the control unit (5) is an integral component of the LCD screen (6).
4. Warning system according to claim 2 or 3, wherein the driveway sensor (4, 14) is connected to the control unit (5), the control unit (5) being configured to activate the pavement sensor (7, 8, 17) in response to the output of the driveway sensor (4, 14).
5. Warning pole (20) comprising a sensor and a first display means connected to the sensor.



Drawings of the Application



Communication

1. The examination is based on the application documents as originally filed. Attached documents D1, D2 and D3 are prior art according to Art. 54(2) EPC.

Independent Claim 1

2. The subject-matter of claim 1 is not new within the meaning of Art. 54(1) and (2) EPC:

D3 discloses a warning system for a driveway crossing (303), comprising:

- a control unit (last sentence of par. [002]),
- a pavement sensor (307) connected to the control unit and configured to detect pedestrians on a pavement (302) approaching the driveway crossing (last-but-one sentence of par. [002]), and
- a first display means (306) connected to the control unit,

the control unit being configured so that the first display means gives a warning signal (flashing yellow signal) to the driver of a vehicle in the driveway (301) in response to the output of the pavement sensor (second sentence of par. [003]).

Dependent Claims

3. Claim 2 does not comply with the requirements of Art. 56 EPC, for the following reasons:

Starting from the warning system of D3 and faced with the technical problem of increasing safety at driveway crossings, the skilled person would look at the prior art according to D1 or D2. From D1 a warning system is known, comprising a driveway sensor (104) configured to detect a vehicle in the driveway (garage exit 101) approaching a driveway crossing. A second display means (warning lights 109 and 110) is configured to warn pedestrians on a pavement (102) that a vehicle is exiting from the driveway (101). Also D2 shows a driveway sensor (204) in combination with a second display means (warning panels 209 and 210). The skilled person would adapt the warning system of D3 by adding a driveway sensor and a display means for pedestrians known from either D1 or D2, without exercising inventive skill.



4. Claim 3 lacks clarity (Art. 84 EPC). The "LCD screen" of dependent claim 3 has not been defined in any of the preceding claims. Moreover, integrating a control unit in an LCD screen is an obvious measure for the person skilled in the art (Art. 56 EPC).
5. Claim 4 does not involve an inventive step (Art. 56 EPC), because the additional features of claim 4 are known from D2: a driveway sensor (weight sensor 204) is connected to a control unit, the control unit being configured to activate a pavement sensor (optical sensors 207 and 208) in response to the output of the driveway sensor (second sentence of par. [003]).

Independent Claim 5

6. Claim 5 does not fulfill the requirements of Art. 54(1) and (2) EPC:
D3 discloses a warning pole (second traffic light 309) comprising a sensor (327) and a first display means (red and green light signals of second traffic light 309) connected to the sensor (first sentence of par. [003]).
7. Claims 1 and 5 are both independent apparatus claims. Therefore, the requirements of Art. 84 EPC in conjunction with Rule 43(2) EPC are not met.

Further Proceedings

8. The applicant is invited to file an amended set of claims that meets the requirements of the EPC.



Document D1

Warning lights for garage exit

5 [001] When drivers exit from a garage they normally drive over a pavement 102 before arriving at the road. Often, safety mirrors 150 and 160 placed at the corners of the garage exit 101 are used to enable the driver to see whether pedestrians are approaching. Advantageously, the mirrors 150 and 160 can also be used by pedestrians on the pavement 102 to see a car which is about to exit from the garage.

10 [002] However, practice has shown that pedestrians often do not notice the mirrors 150 and 160. The convex shape of the mirrors 150 and 160 distorts the image of the car. In short, the mirrors 150 and 160 do not sufficiently warn pedestrians of the potential danger.

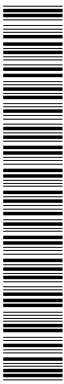
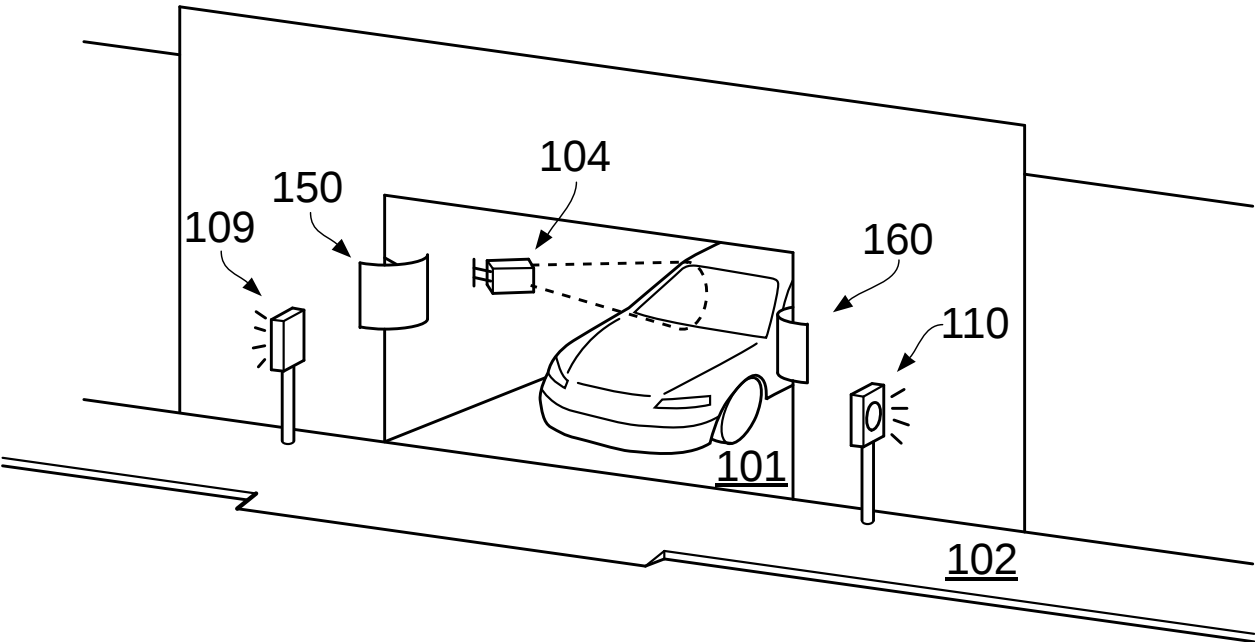
15 [003] In the present warning system, a sensor 104 is placed in the garage exit 101 for detecting a car exiting from the garage. The sensor 104 is preferably an optical sensor, such as a photoelectric cell. The sensor 104 is connected to two warning lights 109 and 110 placed on the pavement 102 at each side of the garage exit 101.

20 [004] In operation, when a car about to exit the garage is detected by the sensor 104, a signal is sent to the warning lights 109 and 110. The warning lights 109 and 110 illuminate and warn pedestrians of the presence of the car.

25 [005] Instead of a photoelectric cell, the sensor 104 may be a camera. In addition to the sensor 104 and the warning lights 109 and 110, conventional safety mirrors 150 and 160 can still be used to assist the driver.



Drawing Document D1



Document D2

Warning system for emergency vehicle exit

[001] The drawing illustrates a driveway crossing of a hospital, as seen from above.

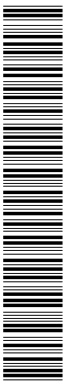
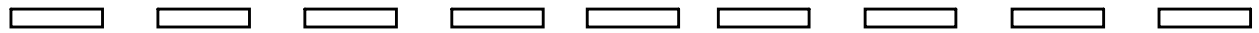
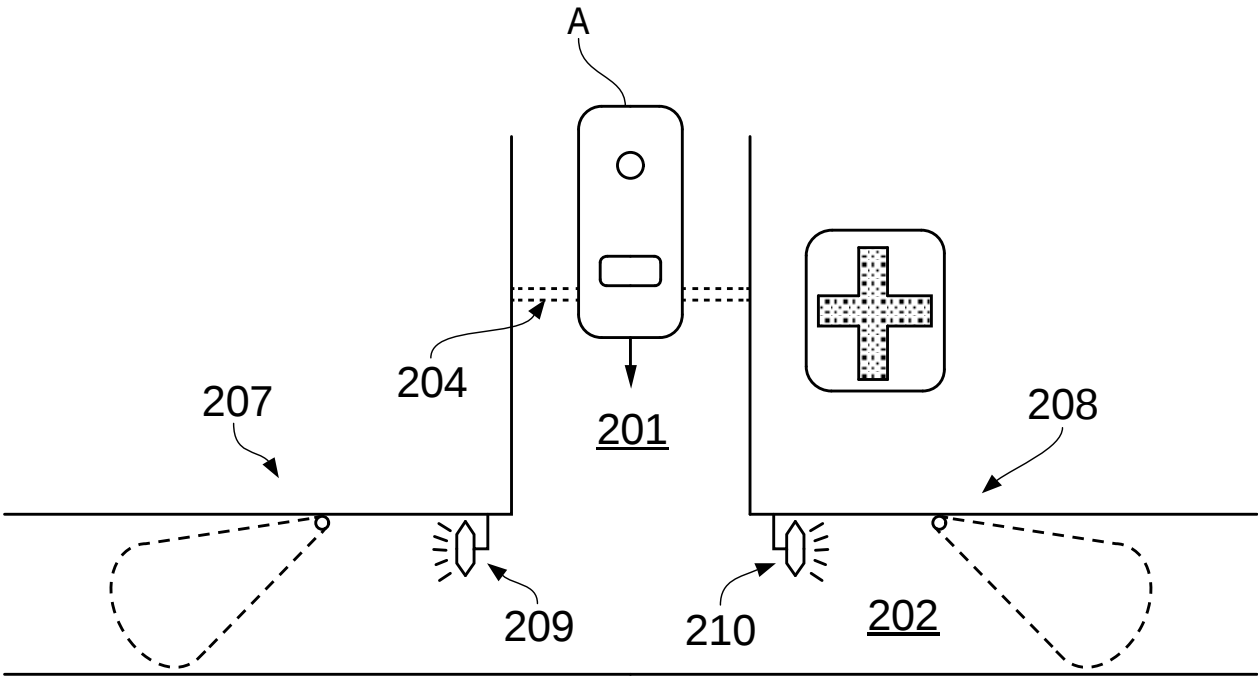
5 When an emergency vehicle A exits from the driveway 201 of the hospital, it drives over the pavement 202 onto the road. Because emergency vehicles drive at high speed, a system for warning pedestrians is proposed. Two electric warning panels 209 and 210 are placed on the pavement 202. When the emergency vehicle A drives over a weight sensor 204 placed in the driveway 201, the warning panels 209 and 210 illuminate, and
10 warn approaching pedestrians that the emergency vehicle is exiting from the driveway.

[002] At times, no pedestrians are in the vicinity of the driveway crossing so the warning is unnecessary. Particularly at night, the unnecessary illumination may disturb residents and generate light pollution. Therefore, optical sensors 207 and 208 are placed on the
15 pavement 202 at both sides of the driveway crossing to detect pedestrians.

[003] Normally, the weight sensor 204 and the warning panels 209 and 210 are in an inactive mode. However, when an approaching pedestrian is detected by one of the optical sensors 207 and 208, a control unit (not shown) activates the weight sensor 204.
20 The weight sensor 204 then remains active for a predetermined time period. In this active mode, when an emergency vehicle exits from the hospital, it will drive over the weight sensor 204 and cause the warning panels 209 and 210 to illuminate. After the predetermined time period and on the condition that no further pedestrians are detected, the control unit returns the weight sensor 204 and the warning panels 209 and 210 to
25 the inactive mode. In the inactive mode, an emergency vehicle can exit from the hospital without causing unnecessary illumination of the warning panels 209 and 210.



Drawing Document D2



Document D3

Busytown Newsletter

[001] *Busytown* – During the city council gathering last Monday, the “Semaphore”

system was presented. Before the introduction of the system, many accidents occurred at the junction of Main Street with Alley, which is our town's narrowest alleyway. At this junction, the drivers cannot see approaching vehicles or pedestrians due to the buildings.

[002] Councillor Connie Gestion presented the details of "Semaphore" by referring to the drawing. "Semaphore" regulates the traffic at the driveway crossing 303 of the alleyway 301 with Main Street by means of traffic lights and sensors. The first traffic light 306 is placed in the alleyway 301 near the driveway crossing 303. It can generate a flashing yellow signal. The second traffic light 309 is placed on Main Street just before the driveway crossing 303. It shows either red, which signals to vehicles on Main Street to stop, or green, allowing vehicles to proceed. First and second optical sensors 327 and 307 are mounted in the supporting post 320 of the second traffic light 309. The first sensor 327 detects vehicles on Main Street which are approaching the driveway crossing 303. The second sensor 307 detects approaching pedestrians on the pavement 302. A control unit (not shown) is integrated in the supporting post 320.

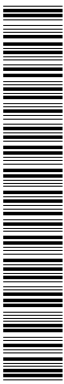
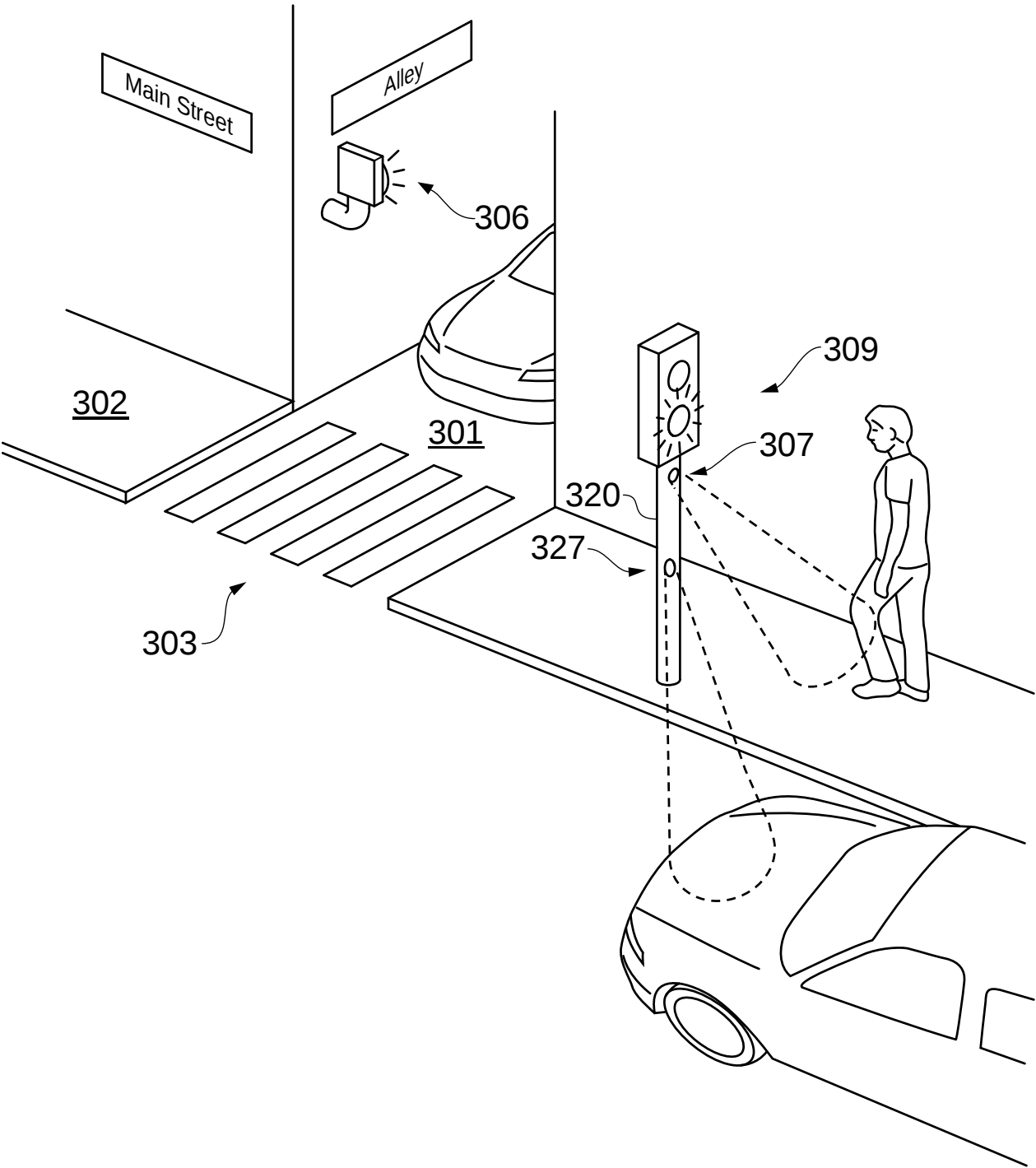
[003] The first and second traffic lights 306 and 309 are controlled by the control unit in response to the output of the first and second sensors 327 and 307. As long as vehicles are detected by the first sensor 327 or pedestrians are detected by the second sensor 307, the first traffic light 306 flashes yellow to warn the driver of a vehicle in the alleyway 301 that there is traffic on Main Street. At the same time, the second traffic light 309 shows green for the vehicles on Main Street. If, during a predetermined time period, the first sensor 327 does not detect a vehicle and the second sensor 307 does not detect a pedestrian, the second traffic light 309 turns red and the first traffic light 306 stops flashing yellow. The driver of a vehicle waiting in the alleyway 301 can now safely turn onto Main Street.



[004] The Councillor concluded her presentation by noting that, although the sensors of the system are operating continuously, resulting in high running costs, “Semaphore” is a benefit to the city.



Drawing Document D3



Client's letter

Dear Mr. T. R. Ampelmann,

- 5 Annexed to this letter is a draft set of amended claims which I think overcome the objections raised in the official communication.

Although I acknowledge that D3 shows a warning system according to original claim 1, D3 does not disclose a driveway sensor. The presence of a driveway sensor helps in
10 reducing the electricity consumption of our warning system.

My invention provides a system giving a warning to the driver in the driveway about approaching pedestrians on the pavement. Warning the pedestrians on the pavement about a vehicle exiting from the driveway is actually a secondary aspect. Therefore, the
15 warning system of D1 is remote from my invention.

I disagree with the objection made against claim 4 in the communication. In D2, the control unit activates the driveway sensor in response to the output of the pavement sensor, not the other way round. In contrast to my invention, the aim of D2 is to clear the
20 passage for an emergency vehicle rather than to give way to pedestrians.

I have redrafted claim 5 as a dependent claim. Hence, I believe that Rule 43 EPC is complied with. I have added one dependent claim to cover a further aspect. I do not wish you to add any further claims.

25

Please make any amendments to the proposed claim set you consider to be necessary for the claims to fulfill the requirements of the EPC, whilst giving me the broadest scope of protection for my invention.

30 Yours sincerely,
John E. Walker



Draft set of claims

(The claims are marked up by underlining additional words and striking through deleted words with respect to the claims as originally filed.)

1. Warning system for a driveway crossing (3, 13), comprising:
 - a control unit (5),
 - a pavement sensor (7, 8, 17) connected to the control unit (5) and configured to detect pedestrians on a pavement (2, 12) approaching the driveway crossing (3, 13), ~~and~~
 - a first display means (6, 16) connected to the control unit (5),the control unit (5) being configured so that the first display means (6, 16) gives a warning signal to the driver of a vehicle in the driveway (1, 11) in response to the output of the pavement sensor (7, 8, 17),
characterised by a driveway sensor (4, 14) connected to the control unit (5) and configured to detect a vehicle in the driveway (1, 11) approaching the driveway crossing (3, 13).
2. Warning system according to claim 1, comprising:
 - ~~— a driveway sensor (4, 14) configured to detect a vehicle in the driveway (1, 11) approaching the driveway crossing (3, 13), and~~
 - a second display means (9) configured to warn pedestrians on the pavement (2, 12) that a vehicle is exiting from the driveway (1, 11).
3. Warning system according to any of the previous claims, wherein the control unit (5) is an integral component of the first display means LCD-screen (6).
4. Warning system according to claim 2 ~~or 3~~, wherein ~~the driveway sensor (4, 14) is connected to the control unit (5), the control unit (5) being~~ is configured to activate the pavement sensor (7, 8, 17) in response to the output of the driveway sensor (4, 14).



5. Warning system according to the preamble of claim 1, characterized by a traffic light in the driveway, the system being configured so that the red light of the traffic light indicates the detection of a pedestrian on the pavement.
6. Warning pole (20) comprising a sensor and a first display means connected to the sensor a warning system preferably according to any of the preceding claims.

