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Datasheet for the decision of 5 March 2021

Case Number: T 0132/20 - 3.2.01

Application Number: 14851180.1

Publication Number: 3052341

IPC: B60Q1/08, B60Q1/14, G06K9/00

Language of the proceedings: EN

Title of invention:
SYSTEM AND METHOD FOR CONTROLLING EXTERIOR VEHICLE LIGHTS ON MOTORWAYS

Applicant:
Gentex Corporation

Headword:

Relevant legal provisions:
EPC Art. 84, 123(2), 54, 56

Keyword:
Claims - support in the description (yes)
Amendments - extension beyond the content of the application as filed (no)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0132/20 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 5 March 2021

Appellant: (Applicant)	Gentex Corporation 600 North Centennial Street Zeeland, MI 49464 (US)
Representative:	Müller-Boré & Partner Patentanwälte PartG mbB Friedenheimer Brücke 21 80639 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 5 July 2019 refusing European patent application No. 14851180.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	J. J. de Acha González
	A. Jimenez

Summary of Facts and Submissions

I. The appeal of the applicant lies against the decision of the Examining Division to refuse European patent application 14851180.1.

II. In its decision the Examining Division held that the subject-matter of claim 1 of the main request was not supported by the description (Article 84 EPC), that the subject-matter of claim 1 of the second auxiliary request did not involve an inventive step when starting from the closest prior art represented by document

D1: US 2012/0271511 A,

that claim 1 of the third auxiliary request was not clear (Article 84 EPC), and that claim 1 of the fourth auxiliary request did not meet the requirements of Article 123(2) EPC. The "new first", "further new first" and fifth auxiliary requests were not admitted into the proceedings pursuant to Article 137(3) EPC.

III. With the statement of grounds of appeal, the appellant requested to set aside the decision of the Examining Division and to grant a patent according to the main request underlying the contested decision and resubmitted with the statement of grounds of appeal, or, in the alternative, according to the first to seventh auxiliary requests filed with the statement of grounds of appeal.

IV. After a telephone consultation with the rapporteur of the Board, the appellant filed with letter dated 3 March 2021 a new main request.

The appellant requested to set aside the decision of the Examining Division and to grant a patent based on the main request as filed on 3 March 2021 or, in the alternative, to grant a patent based on the main request and first to seventh auxiliary requests filed with the grounds of appeal and renumbered first to eighth auxiliary requests, respectively.

V. Claim 1 of the main request reads as follows (differences with respect to claim 1 as originally filed highlighted by the Board):

"An exterior light control system (10) for controlling exterior lights (80) of a controlled vehicle, comprising:

an imaging system (20) configured to image a scene external and forward of the controlled vehicle and to generate image data corresponding to the acquired images; and

a controller (30) configured to: determine if the controlled vehicle is traveling on a motorway, receive and analyze the image data in order to detect headlamps of an oncoming vehicle, and generate an exterior light control signal that is used to control the exterior lights (80) in response to analysis of the image data and in response to a selected mode of operation,

wherein, if said controller (30) detects that the controlled vehicle is traveling on a motorway and detects headlamps of an oncoming vehicle, said controller (30) is configured to generate an exterior light control signal for reducing the brightness of the exterior lights (80), to determine a ~~relative~~ location within the acquired images of a headlamp closest to a central feature of the acquired images, ~~and to select a delay that varies dynamically in response to the~~

~~relative location of the headlamp,~~ and to set a dynamic delay based on the determined location, such that the delay is greater when the headlamp is detected closer to the central feature of the image and is lesser when the headlamp is detected closer to the side of the image, and

wherein, upon determining that oncoming headlamps are no longer present in the acquired images that require the exterior lights (80) to remain in a reduced brightness state, said controller (30) is configured to nevertheless continue to analyze acquired images for the ~~selected~~ set dynamic delay before generating an exterior light control signal for increasing the brightness of the exterior lights (80)."

Claim 9 of the main request reads as follows (differences with respect to claim 13 as originally filed highlighted by the Board):

"A non-transitory computer readable medium (32) having stored thereon software instructions that, when executed by a processor, cause the processor to generate control signals for controlling exterior lights (80) of a controlled vehicle, by executing the steps comprising:

imaging a scene external and forward of the controlled vehicle and generating image data corresponding to the acquired images;

receiving and analyzing the image data in the processor in order to detect headlamps of an oncoming vehicle;

determining that the controlled vehicle is traveling on a motorway;

generating a control signal from the processor that is used to control the exterior lights (80) in response

to analysis of the image data and in response to a selected mode of operation; and

wherein, if the processor detects that the controlled vehicle is travelling on a motorway and detects headlamps of an oncoming vehicle, the processor is configured to generate an exterior light control signal for reducing the brightness of the exterior lights (80), to determine a ~~relative~~ location within the acquired images of a headlamp closest to a central feature of the acquired images, ~~and to select a delay that varies dynamically in response to the relative location of the headlamp,~~ and to set a dynamic delay based on the determined location, such that the delay is greater when the headlamp is detected closer to the central feature of the image and is lesser when the headlamp is detected closer to the side of the image, and

wherein, upon determining that oncoming headlamps are no longer present in the acquired images that require the exterior lights (80) to remain in a reduced brightness state, the processor is configured to nevertheless continue to analyze acquired images for the ~~selected~~ set dynamic delay before generating an exterior light control signal for increasing the brightness of the exterior lights (80)."

Reasons for the Decision

1. Claim 1 according to the main request underlying the present decision is based on claim 1 together with paragraphs 16 to 19 of the application as originally filed (reference is made to the publication of the international application when referring to the

application as originally filed, WO 2015/050996 A). Claim 9 is based on claim 13 together with paragraphs 16 to 19 of the application as originally filed. The objection under Article 123 (2) EPC in the contested decision was in respect of the amendment of claim 1 of the fourth auxiliary request "wherein a coordinate system is based on the origin located at the center of the image". Such feature is not present in any of the claims according to the main request and thus this objection no longer applies. The subject-matter of claims 1 and 9 does not thus go beyond the content of the application as originally filed (Article 123(2) EPC).

2. In the contested decision the Examining Division took the view that the expression "set a dynamic delay based on the determined position" in claim 1 according to the main request then on file was not supported by the description (Article 84 EPC). The Examining Division argued (see points 13.1 to 13.4) that said expression implied that the delay might be set in an arbitrary manner based on the determined position. For example, said wording encompassed the case where a small delay was set for headlamps which were far from the ego vehicle. However, according to the description (paragraphs 0016-0017), the farther away the oncoming vehicle was, the greater the delay.

This objection is overcome by claim 1 of the present main request (Article 84 EPC). Claim 1 now recites that the dynamic delay is such that the closer the headlamp is to the central feature of the acquired images, the greater the selected delay. Since vehicles whose headlamps appear near the central feature of the capture image are generally farther away than those whose headlamps appear nearer to the side of the image

(either left or right side, thus considering both countries where vehicles are driven on the right-hand side and countries where they are driven on the left-hand side) when the vehicle is travelling on a motorway, the delay is set greater for headlamps of oncoming vehicles that are far away from the controlled vehicle and shorter for vehicles that are closer to the controlled vehicle.

3. The other objection under Article 84 EPC (lack of clarity) in the contested decision was in respect of claim 1 of the third auxiliary request including a mathematical equation defining the dynamic delay. Such mathematical equation is not present in any of the claims according to the main request and thus no longer applies.

4. The Board seeing no other reasons to question the clarity and the support in the description concludes that the claims according to the main request meet the requirements of Article 84 EPC.

5. When dealing with the question of inventive step (second auxiliary request underlying the contested decision), the Examining Division considered that the exterior light control system disclosed in D1 comprised a controller that was configured to set a dynamic delay based on a determined position within the acquired images of a headlamp (point 23.1 of the contested decision). However, as pointed out by the appellant, according to paragraph 226 referred to by the Examining Division and also according to paragraphs 45, 51 and 227 of D1 the delay is set based on the detection rate of other road users and not based on a determined position of a headlamp within the acquired images.

Also, D1 undisputedly (see point 23.2 of the contested decision) does not disclose that the controller is configured to determine whether the controlled vehicle is travelling on a motorway.

None of the other prior art documents cited in the search report discloses the above mentioned features either.

Consequently, the subject-matter of claim 1 and of claim 9 is new in view of the available prior art (Article 54 EPC).

6. Furthermore, the subject-matter of claim 1 and of claim 9 according to the main request involves an inventive step in view of the available prior art (Article 56 EPC).

Starting from D1 as the closest prior art, the subject-matter of claim 1 of the main request differs therefrom in that:

(i) the controller is configured to determine if the controlled vehicle is traveling on a motorway;

(ii) if the controller detects that the controlled vehicle is travelling on a motorway, the controller is configured to determine a location within the acquired images of a headlamp closest to a central feature of the acquired images, and

(iii) to set a dynamic delay based on the determined location, such that the delay is greater when the headlamp is detected closer to the central feature of the image and is lesser when the headlamp is detected closer to the side of the image.

This has the effect that when the controlled vehicle is travelling on a motorway, the return to a bright light state of the controlled vehicle's headlights is dynamically delayed in response to where, within the acquired image, the headlamp of an oncoming vehicle is located. Undesired return to a bright light state due to intermittent obstacles in the median of the motorway and, as a consequence, excessive glare for the oncoming vehicle or distractions of the driver of the controlled vehicle due to frequent changes of state, may thus be avoided (see paragraphs 15 to 19 of the application as originally filed). Accordingly, the objective technical problem may be seen in avoiding excessive glare for oncoming vehicles and distractions of the driver due to intermittent median obstacles when the vehicle is travelling on a motorway.

Albeit done in respect of a different claim (namely claim 1 according to the second auxiliary request underlying the decision under appeal) the reasoning of the Examining Division in respect of inventive step starting from D1 is flawed because, as already explained above, D1 does not disclose a controller configured to set a dynamic delay based on a determined position within the acquired images of a headlamp. This is a feature which is essential to the solution of the above-mentioned problem. Not only it is not disclosed, but it also not suggested by D1, nor by any of the documents cited in the search report. Accordingly, the subject-matter of claim 1 of the main request involves an inventive step (Article 56 EPC).

Analogous consideration apply to claim 9, because this claim relates to a non-transitory computer readable medium having stored thereon software instructions

that, when executed by a processor, cause the processor to generate control signals for controlling exterior lights of a controlled vehicle in the same manner as the system in accordance with claim 1.

7. Accordingly, the set of claims of the main request together with the adapted description and the figures as originally filed form a suitable basis for the grant of a patent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division with the order to grant a European patent on the basis of the following documents:
   - Claims: 1 to 15 of the main request filed with letter dated 3 March 2021;
   - Drawings: sheets 1/4 to 4/4 as originally filed; and
   - Description: pages 1 to 3, 3a, 4 to 6, 8, 11, 14, 15 filed with letter of 3 March 2021 and pages 7, 9, 10, 12 and 13 as originally filed.

The Registrar: The Chairman:

D. Magliano G. Pricolo

Decision electronically authenticated