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(54) **DETECTOR CONTROLLED ILLUMINATING SYSTEM**

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(Continued)

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H05B 47/105	(2020.01)
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H05B 47/11	(2020.01)
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F21K 9/23	(2016.01)
H05B 45/395	(2020.01)
H05B 45/20	(2020.01)
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(58) **Field of Classification Search**

None

See application file for complete search history.

(56) **References Cited**

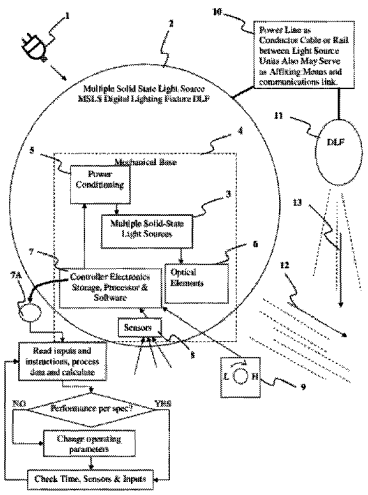
To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/014,815, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

Primary Examiner — Henry N Tran

(57) **ABSTRACT**

An illuminating device coupled with sensors or an image acquisition device and a logical controller allows illumination intensity and spectrum to be varied according to changing user needs. The system provides illumination to areas according to the principles of correct lighting practice for the optimal performance of visual tasks in the most efficient, cost effective manner. Aspects of the invention include: lighting fixtures which adapt to ambient lighting, movement, visual tasks being performed, and environmental and personal conditions affecting illumination requirements at any given instant. Lighting fixtures having spatial distribution of spectrum and intensity, providing both "background" room lighting, and "task" lighting.

At the time of issuance and publication of this certificate, the patent remains subject to pending reissue application number 16/858,342 filed Apr. 24, 2020. The claim content of the patent may be subsequently revised if a reissue patent is issued from the reissue application.



Related U.S. Application Data

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EX PARTE REEXAMINATION CERTIFICATE

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **6** is cancelled.

New claims **24-87** are added and determined to be patentable.

Claims **1-5** and **7-23** were not reexamined.

24. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on die structure for detecting coordinate-specific information about the illuminated area, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

determine coordinates corresponding to an other vehicle, based on the coordinate-specific information;

select a cluster of the LEDs that emit light toward at portion of the other vehicle based on the LEDs having emission aimings associated with the first coordinates; and

change emission of the selected cluster of LEDs relative to emission of other LEDs not included in the cluster to create headlamp illumination that preserves a first level of illumination illuminating past the other vehicle while preventing glare to a driver of the other vehicle.

25. The illuminating device of claim 24, wherein:

the changed emission includes a change to at least one of intensity Or color or a change of at least one LED of the cluster to a non-emitting state; and

the cluster includes a plurality of the LEDs and the cluster non-contiguous LEDs.

26. The illuminating device of claim 24, wherein the memory further stores instructions that when executed by one or more processors of the controller, enable the controller to:

identify an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the at least one headlamps.

27. The illuminating device of claim 26, wherein:

the changed emission includes a change to at least one of intensity or color or a change of at least one LED of the cluster to a non-emitting state;

the cluster includes a plurality of the LEDS and the cluster includes non-contiguous LEDs; and

the memory further stores instructions that, when executed one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

28. The illuminating device claim 26, wherein identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

29. The illuminating device of claim 26, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

30. The illuminating device of claim 24, further including one or more optical control elements to control light emitted from one or more of the LEDs.

31. The illuminating device of claim 30, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

32. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for t controlled powering of the LEDS and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on the structure for detecting coordinate-specific information about the illuminated area and positioned to capture an image of at least one target, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information communicated

from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

create a beam of diminished illumination illuminating at least a portion of the at least one target with non-glaring illumination, created in a broader field of illumination having different intensity than the beam, by one or more changes to characteristics of first light of a cluster of the LEDs providing the first light directed at the at least a portion and creating the beam, the beam diminished in intensity relative to the broader field of illumination illuminating at least above and on both sides of the beam; and

follow, based at least in part on data from one or more of the cameras, the at least one target with the diminished illumination as the at least one target changes location relative to the motor vehicle.

33. The illuminating device of claim 32 wherein:

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to select the cluster of LEDs based at least in part on known aimings of the first light associated with the first cluster having a correlation to the at least the portion, the known aimings based at least in part on at least one of known directionality of light emitted by the first cluster or known directionality of light emitted by the first cluster exiting the headlamp;

the data includes image data;

the one or more changes to characteristics of the first light include a change to at least one of intensity or color or a change of at least one LED of the cluster to a non-emitting state; and

the cluster includes a plurality of the LEDs and the cluster includes non-contiguous LEDS.

34. The illuminating device of claim 32, wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identity an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the at least one headlamps.

35. The illuminating device of claim 14, wherein:

the one or more changes to characteristics of the first light include a change to at least one of intensity or color or a change of at least one LED of the cluster to a non-emitting state;

the cluster includes a plurality of the LEDs and the cluster includes non-contiguous LEDs;

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to select the cluster of LEDs based at least in part on known aimings of the first light associated with the first cluster having a correlation to the at least the portion, the known aimings based at least in part on at least one of known directionality of light emitted the first cluster or known directionality of light emitted by the first cluster exiting the headlamp; and

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

36. The illuminating device of claim 34 wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

37. The illuminating device of claim 34, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

38. The illuminating device of claim 32, further including one or more optical control elements to control light emitted from one or more of the LEDs.

39. The illuminating device of claim 38, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

40. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on the structure for detecting coordinate-specific information about the illuminated area and positioned to capture an image of at least two other vehicles, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

determine a list cluster of the LEDs illuminating at least a first portion of a first other vehicle based at least in part on data from one or more of the sensors indicating a first position associated with the first other vehicle;

diminish glaring illumination of the first other vehicle by a first change to one or more characteristics of first light of at least the first cluster;

determine a second, different cluster of the LEDs illuminating at least a second portion of a second other vehicle based at least in part on the data indicating a second position associated with the second other vehicle;

diminish glaring illumination of the second other vehicle by a second change to one or more characteristics of second light of at least the second, different cluster;

wherein the first and second changes decrease intensity of first emission from the first cluster and second emission from the second cluster relative to a third emission, from the at least one headlamp, illuminating an area between the first and second portion.

41. The illuminating device of claim 40, wherein:

the data includes image data;

at least one of first or second change to characteristics of light associated with at least one of the first or second cluster of LEDs includes at least one of a chance to color, to intensity, or a change of at least one LEDs of the respective cluster to a non-emitting state;

at least one of the first cluster or the second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs;

the determination of the first cluster includes selection of the first cluster based at least in part on known aimings of light associated with the first cluster having a correlation to the first position, the known aimings based at least in part on at least one of known directionality of light emitted by the first cluster or known directionality of light emitted by the first cluster exiting the headlamp; and

the determination of the second cluster includes selection of the second cluster based at least in part on known aimings light associated with the second cluster having a correlation to the second position, the known aimings based at least in part on at least one of known directionality of light emitted by the second cluster or known directionality of light emitted by the second cluster exiting the headlamp.

42. The illuminating device of claim 40, wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identify an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the at least one headlamps.

43. The illuminating device of claim 42, wherein:

at least one of the first or second change to characteristics of the associate with at least one of the first or second cluster of LEDs includes at least one of a change to color, to intensity, or a change of at one LED of the respective cluster to a non-emitting state;

at least one of the cluster or the second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs;

the determination of the first cluster includes selection of title first cluster based at least in part on known aimings of light associated with the first cluster having a correlation to the first position, the known aimings based at least in part on at least one of known directionality of light emitted by the first cluster or known directionality of light emitted by the first cluster exiting the headlamp;

the determination of the second cluster includes selection of the second cluster based at least in part on known aimings of light associated with the second cluster having a correlation to the second position, the known aimings based at least in part on at least one of known directionality of light emitted by the second cluster or known directionality of light emitted by the second cluster exiting the headlamp; and

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of light pattern in at least one of color, intensity or spatial distribution by modification of associated with one or more of the LEDs.

44. The illuminating device of claim 42, wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

45. The illuminating device of claim 42, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the pattern is based at least in part on the sensor data.

46. The illuminating device of claim 40, further including one or more optical control element to control light emitted from one or more of the LEDs.

47. The illuminating device of claim 46, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

48. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on the structure for detecting coordinate-specific information about the illuminated area, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller including at least one o the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information, communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

illuminate a portion of at least one object, indicated by data from at least one of the one or more sensors, by selecting a first cluster of the LEDs to emit first light directed towards a first area including the at least the portion of at least one object, the first area determined based at least in part on the data, the first cluster selected based at least in part on known aimings of light associated with the first cluster determined to correspond to the first area, and the first light determined based at least in part on classifying the object based at least in part on the data; and control light emitted from the first cluster directed towards the first area to be different in at least one emission characteristic, based on the first

light determination, from second light emitted from a second, different cluster of the LEDs, directed towards one or more illuminated second areas at a common elevation with the first area and laterally adjacent to the area.

49. The illuminating device of claim 48, wherein:

the data includes image data;

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to illuminate the at least the portion with light below at least a predefined glare level;

the at least one object includes at least one of a pedestrian, a sign, or another vehicle;

at least one of the first cluster or the second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs;

the control of the light emitted from the first cluster includes a change of at least one LED of the cluster to a non-emitting state;

the at least one emission characteristic is different following modification by an optical control element; and

the known aimings of light associated with the first cluster is at east on part on known directionality of light emitted by LEDs of the first cluster exiting from the at least one headlamp.

50. The illuminating device of claim 48, wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identify an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the headlamps.

51. The illuminating device of claim 50, wherein:

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to illuminate the at least the portion with light below at least a predefined glare level;

the at least one object includes at least one of a pedestrian, a sign, or another vehicle;

at least one of the first cluster or the second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs;

the control of the light emitted from the first cluster includes a change of at least one LED of the cluster to a non-emitting state;

the at least one emission characteristic is different following modification by an optical control element;

the known aimings of light associated with the first cluster is based at least on part on known directionality of light emitted by LEDs of the first cluster exiting from the at least one headlamp; and

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

52. The illuminating device of claim 50, wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the pattern is based at least in part on the map data.

53. The illuminating device of claim 50, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

54. The illuminating device of claim 48, further including one or more optical control elements to control emitted from one or more of the LEDs.

55. The illuminating device of claim 54, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

56. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, place on the structure for detecting coordinate-specific information about the illuminated area and positioned to capture an image of at least one other vehicle ahead of the motor vehicle, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one o the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

determine, based on data from one or more of the sensors, a vertical and horizontal position associated with the at least one other vehicle;

select a first cluster of the LEDs based at least in part on at least one of the vertical and horizontal position compared to known aimings of light associated with the first cluster; and

reduce intensity of illumination to non-glaring illumination of a first area associated with the at least one other vehicle, relative intensity of illumination on both sides of the first area at elevations common with the first area illuminated by a second cluster of the LEDs, by control of emission from the first cluster.

57. The illuminating device of claim 56, wherein:

the data includes image data;

the control of emission of the first cluster includes a change of at least one of color or intensity or control of at least one LED of the first cluster into a non-emitting state;

at least one of the first cluster second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs; and

the known light aimings associated with the first cluster is based at least on art on known directionality of light emitted by LEDs of the first cluster exiting from the at least one headlamp.

58. The illuminating device of claim 56 wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identify an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the headlamps.

59. The illuminating device of claim 58, wherein:

the control of emission of the first cluster includes a change of least one of color or intensity or control of at least one LED of the first cluster into a non-emitting state;

at least one of the first cluster or the second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs;

the known light aiming associated with the first cluster is based at least on part on known directionality of light emitted by LEDs of the first cluster exiting from the at least one headlamp; and

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

60. The illuminating device of claim 58, wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

61. The illuminating device of claim 58, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

62. The illuminating device of claim 56, further including one or more optical control elements to control light emitted from one or more of the LEDs.

63. The illuminating device of claim 62, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

64. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs and in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on the structure for detecting coordinate-specific information about the illuminated area and positioned to capture an image of another vehicle, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

select a first cluster of the LEDs having light associated there that is directed towards the other vehicle based at least in part on first data from one or more of the sensors indicating a first position associated with the other vehicle;

control a first change to one or more characteristics of the light associated with the first cluster of the LEDs that is directed towards the other vehicle, that diminishes glare to a driver of the other vehicle when the other vehicle is at the first position;

select a second, different cluster of the LEDs having light associated therewith that is directed towards the other vehicle based at least in part on second, subsequent data from one or more of the sensors indicating a second, subsequent position associated with the other vehicle; and

control a second, subsequent change, to one or more characteristics of the light that is subsequently directed towards the other vehicle, that diminishes glare to the driver of the other vehicle when the other vehicle is at the second position.

65. The illuminating device of claim 64, wherein:

the first data or second data includes image data;

at least one of the first or second change to characteristics of light associated with at least one of the first or second cluster of LEDs includes at least one of a change to color, to intensity, or a change of at least one LED respective cluster to a non-emitting state;

at least one of the first cluster or the second cluster includes a plurality of the LEDs and at least one of he first cluster or the second cluster includes non-contiguous LEDs; and

the light that is directed or subsequently directed towards the other vehicle is determined based at least in part on known directionality of light emitted by the respective first or second cluster exiting the at least one headlamp.

66. The illuminating device of claim 64, wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identify an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the headlamps.

67. The illuminating device of claim 66, wherein:

at least one of the first or second change to characteristics of light associated with at least one of the first or second cluster of LEDs includes at least one of a change to color, to intensity, or a change of at least one LED of the respective duster to a non-emitting state;

at least one of the first cluster or the second cluster includes a plurality of the LEDs and at least one of the first cluster or the second cluster includes non-contiguous LEDs;

the light that is directed or subsequently directed towards the other vehicle is determined based at least in part on known directionality of light emitted by the respective first or second cluster exiting the at least one headlamp; and

the memory further stores instructions that, when executed one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

68. The illuminating device of claim 66, wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

69. The illuminating device of claim 66, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

70. The illuminating device of claim 64, further including one or more optical control elements to control light emitted from one or more of the LEDs.

71. The illuminating device of claim 70, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

72. An illuminating device having automatic control of the light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other elements of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on the structure for detecting coordinate-specific information about the illuminated area, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

determine a target based on first data from one or more of the sensors;

determine a first target location based on the first data;

select a cluster of the LEDs having light associated therewith that is directed at the target, determined based on the first target location;

vary illumination provided to the target by the selected cluster, relative to illumination provided to areas laterally adjacent to the target and provided by at least one LED different from LEDs in the selected cluster; and

maintain a variance of illumination provided to the target relative to the laterally adjacent areas, when subsequent data from one or more of the cameras indicates a change in position of the target relative to the motor vehicle, by repeating the determination of target location, selection of the cluster and variance to illumination provided to the target, relative to the laterally adjacent areas, based on the subsequent data.

73. The illuminating device of claim. 72, wherein:

the variation of illumination provided to the target includes variation in at least one of color or intensity at least a change of at least one LED of the selected cluster to a non-emitting state;

the cluster includes a plurality of the LEDs and the cluster includes non-contiguous LEDs;

the light directed at the target is determined based at least in part on known directionality of light emitted by the first cluster exiting from the at least one headlamp; and

at least one of the first data or the subsequent data includes image data.

74. The illuminating device of claim 72, wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identity an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodated the upcoming road curvature by adaptation of a light pattern of at least one of the headlamps.

75. The illuminating device of claim 74, wherein:

the variation of illumination provided to the target includes variation in at least one of color or intensity or at least a change of at least one LED of the selected cluster to a non-emitting state

the selected cluster includes a plurality of the LEDs and the selected cluster includes non-contiguous LEDs;

the light directed at the target is determined based at least in part on known directionality of light emitted by the first cluster exiting from the at least one headlamp; and

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to accommodate road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

76. The illuminating device of claim 74, wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

77. The illuminating device of claim 74, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

78. The illuminating device of claim 72, further including one or more optical control elements to control light emitted from one or more of the LEDs.

79. The illuminating device of claim 78 wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

80. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements, wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, place on the structure or detecting coordinate-specific information about the illuminated area and positioned to capture camera data indicating a target ahead of the motor vehicle, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the LED controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

identify, based on data received from one or more of the sensors, a plurality of positions associated with the target as the target move relative to the motor vehicle; and

change, responsive to the positions associated with the target, first light associated with one or more LEDs aimed toward at least a portion of the target, relative to second light associated with other one or more of the LEDs aimed laterally adjacent the target on either side, as the target moves relative to the motor vehicle.

81. The illuminating device of claim 80, wherein:

the data includes image data;

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to select a first cluster of LEDs, associated with the first light, for the change, based at least in part on known aimings of the first light associated with the first cluster having a correlation to the at least the portion, the known aimings based at least in part on at least one of known directionality of light emitted by the first cluster or known directionality of light emitted by the first cluster exiting the headlamp; and

the change to emission of one or more LEDs aimed to towards the at least the portion includes a change to intensity or color or a chance of a least one of the LEDs to a non-emitting state.

82. The illuminating device of claim 80, wherein the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to:

identify an upcoming road curvature along a road on which the motor vehicle is traveling; and

accommodate the upcoming road curvature by adaptation of a light pattern of least one of the at least one headlamps.

83. The illuminating device of claim 82, wherein:

the change to emission of the one or more LEDs aimed towards the at least the portion includes a change to intensity or color or a change of at least one of the LEDs to a non-emitting state;

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to select a first cluster of LEDs, associated with the first light, for the change, based at least in part on known aimings of the first light associated with the first cluster having a correlation to the at least the portion, the known aimings based at least in part on at least one of known directionality of light emitted by the first cluster or known directionality of light emitted by the first cluster exiting the headlamp; and

the memory further stores instructions that, when executed by one or more processors of the controller, enable the controller to accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity or spatial distribution by modification of light associated with one or more of the LEDs.

84. The illuminating device or claim 82, wherein the identification of the upcoming road curvature is based at least in part on map data and wherein the adaptation of the light pattern is based at least in part on the map data.

85. The illuminating device of claim 82, wherein the identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.

86. The illuminating device of claim 80, further including one or more optical control elements to control light emitted from one or more of the LEDs.

87. The illuminating device of claim 86, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

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