

prongs 4181 may latch to secure the clip 4183 and PCB 4147 to baffle/PCB holder 4130 and to assist in securing the engagement of couplers 4149 and 4179.

The above-described mounting structure provides several advantageous features. Specifically, the tilt angle of the image sensor may be selectively adjusted while not requiring movement of the housing cover relative to the mirror mount. This avoids the need to have mounting screws accessible from the exterior of the housing and thus reduces the possibility of someone tampering with the adjustment subsequent to final adjustment by the manufacturer. Further, the interior components shown in Figs 46-49 may be secured to mirror mount 4101 after it has been secured to the vehicle windshield and the adjustment may then be made with the housing cover subsequently snapped into place following final adjustment.

An additional advantage is provided by the use of light pipe 4151. In the absence of light pipe 4151, an additional circuit board would need to be mounted at an angle relative to PCB 4147 to aim the die mounted on such an inclined PCB towards the sky above the vehicle.

Although the mirror mount accessory housing has been described for mounting an image sensor, sky sensor, and compass sensors, it will be appreciated that any one or combination of these components may be disposed in the housing. Further, other components may be disposed in the housing in addition to, or in place of, any or all of the above components.

While the present invention has generally be described as preferably utilizing the full capability of the exterior lights to produce a large number of potential beam patterns that may change discretely or through a continuum, it is possible to use the system to simply turn headlamps on and off, as disclosed, for example, in U.S. Patent Application No. 09/491,192, entitled VEHICLE EQUIPMENT CONTROL WITH SEMICONDUCTOR LIGHT SENSORS, filed by Jon Bechtel et al. on January 25, 2000.

While the invention has been described in detail herein in accordance with certain embodiments thereof, many modifications and changes may be effected by those skilled in the art without departing from the spirit of the invention. Accordingly, it is intended that the appended claims not be limited by way of details and instrumentalities describing the embodiments shown herein.

CLAIMS

The invention claimed is:

1. A control system to control exterior lights of a controlled vehicle comprising:
an imaging system configured to image the scene forward of the controlled vehicle; and
a control circuit for processing the image of the scene obtained from said imaging system and for controlling the exterior lights to change their beam pattern in response to objects detected in the processed scene, said control circuit disables automatic control of the exterior lights in response to activation of the vehicle windshield wipers.
2. The control system of claim 1, wherein said control circuit is coupled to receive a signal from said windshield wipers when they are activated.
3. The control system of claim 1, wherein said control circuit determines that the windshield wipers are activated upon detecting a wiper within the scene imaged by said imaging system.
4. The control system of claim 1, wherein said control circuit determines that the windshield wipers are activated upon receiving a wiper activation signal from a rain sensor provided in the vehicle.
5. The control system of claim 1, wherein said imaging system is disposed in a rearview mirror assembly.
6. The control system of claim 1, wherein said control circuit changes the beam pattern of the exterior lights by turning on or off at least one of the exterior lights.
7. The control system of claim 1, wherein said control circuit changes the beam pattern of the exterior lights by continuously varying the brightness of at least one of the exterior lights.

8. The control system of claim 1, wherein the exterior lights include headlamps operable in at least high and low beam states, and wherein said control circuit prevents the headlamps from operation in a high beam state when the vehicle windshield wipers are activated.
9. The control system of claim 1, wherein said control circuit is responsive to the speed of the windshield wipers to disable automatic control of the exterior lights when the windshield wipers are operating above a threshold speed.
10. The control system of claim 1, wherein the exterior lights include foul weather lights and said control circuit activates the foul weather lights when the vehicle windshield wipers are activated.
11. The control system of claim 10, wherein the foul weather lights include fog lights and said control circuit activates the fog lights when the vehicle windshield wipers are activated.
12. A control system to control exterior lights of a controlled vehicle comprising:
an imaging system configured to image the scene forward of the controlled vehicle; and
a control circuit for processing the image of the scene obtained from said imaging system and for controlling the exterior lights to change their beam pattern in response to objects detected in the processed scene, said control circuit disables automatic control of the exterior lights when fog is detected on the windshield.
13. The control system of claim 12, wherein fog is detected to be on the windshield when the vehicle windshield defroster is operating at a speed above a threshold.
14. The control system of claim 12, wherein said imaging system is disposed in a rearview mirror assembly.
15. The control system of claim 12, wherein said control circuit is disposed in a rearview mirror assembly.

16. The control system of claim 12, wherein the exterior lights include headlamps operable in at least high and low beam states, and wherein said control circuit prevents the headlamps from operation in a high beam state when the vehicle windshield defroster is operating at full speed.

17. The control system of claim 12, wherein said control circuit changes the beam pattern of the exterior lights by turning on or off at least one of the exterior lights.

18. The control system of claim 12, wherein said control circuit changes the beam pattern of the exterior lights by continuously varying the brightness of at least one of the exterior lights.

19. The control system of claim 12, wherein the exterior lights include foul weather lights and said control circuit activates the foul weather lights when the vehicle windshield defroster is operating at full speed.

20. The control system of claim 19, wherein the foul weather lights include fog lights and said control circuit activates the fog lights when the vehicle windshield defroster is operating at full speed.

21. A method of detecting snowfall or fog outside a vehicle comprising the steps of:
sensing light levels forward of the vehicle and light levels above the vehicle;
comparing the relative brightness of the light levels forward and above the vehicle;
and
determining that it is snowing or foggy when a ratio of the relative brightness forward of the vehicle to that above the vehicle reaches a threshold.

22. The method of claim 21, wherein the relative brightness of the light levels forward and above the vehicle are compared as the brightness of the vehicle's headlamps is increased.

23. A control system to control exterior lights of a controlled vehicle comprising:
a light sensing system configured to sense light levels forward of the controlled vehicle; and

a control circuit for light levels obtained from said sensing system and for controlling the exterior lights to change their beam pattern in response to the obtained light levels, said control circuit disables automatic control of the exterior lights when snow is detected.

24. The control system of claim 23, wherein said sensing system senses light levels forward of the vehicle and above the vehicle.

25. The control system of claim 24, wherein said sensing system includes a single pixel sensor for sensing the light level above the vehicle.

26. The control system of claim 25, wherein said sensing system includes a second sensor for sensing the light level forward of the vehicle.

27. The control system of claim 26, wherein said single pixel sensor is positioned at about a 45° angle relative to said second sensor.

28. The control system of claim 24, wherein said sensing system includes a second sensor for sensing the light level forward of the vehicle.

29. The control system of claim 24, wherein said control circuit compares the relative brightness of the light forward of the vehicle with that of the light above the vehicle as the brightness of the vehicle's headlamps increases, and determines that it is snowing when the ratio of relative brightness forward of the vehicle to that above the vehicle reaches a threshold.

30. The control system of claim 23, wherein the exterior lights include headlamps operable in at least high and low beam states, said control circuit disables the headlamps from operation in a high beam state when the vehicle windshield defroster is operating at full speed.

31. The control system of claim 23, wherein the exterior lights include headlamps operable in at least high and low beam states, said control circuit disables the headlamps from operation in a high beam state when the vehicle windshield wipers are activated.

32. The control system of claim 25, wherein said single pixel sensor senses the ambient light outside of the vehicle, and said control circuit varies the brightness of daytime running lamps in response to the ambient light level sensed by said single pixel sensor.

33. The control system of claim 23, wherein the exterior lights include daytime running lights, said imaging system comprising an ambient light sensor for sensing the ambient light outside of the vehicle, and said control circuit varies the brightness of daytime running lamps in response to the ambient light level sensed by said ambient light sensor.

34. The control system of claim 23, wherein said imaging system includes an image array sensor including a plurality of pixels, and an optical system configured to image the scene forward of the controlled vehicle onto said image array sensor, said optical system including a forwardmost surface, said optical system includes a hydrophilic coating on said forwardmost surface.

35. The control system of claim 23, wherein the exterior lights include headlamps operable in at least high and low beam states, said control circuit disables the operation of the headlamps in the high beam state when it is snowing.

36. A method of controlling vehicle headlamps comprising the steps of:
detecting whether it is snowing; and
disabling the headlamps from operation in a high beam state when it is snowing.

37. A control system to control the brightness of the tail lights of a vehicle comprising:
an ambient light sensor for sensing the ambient light outside of the vehicle; and
a control circuit for varying the brightness of the tail lights in response to the ambient light level sensed by said ambient light sensor.

38. The control system of claim 37, wherein said ambient light sensor is disposed in a rearview mirror assembly.

39. The control system of claim 37, wherein said control circuit is disposed in a rearview mirror assembly.

40. A headlamp control system for controlling the headlamps of a controlled vehicle, said headlamp control system comprising:

an imaging system configured to image the scene forward of the controlled vehicle;

a control circuit coupled to said imaging system for identifying and determining the brightness of light sources in images obtained from said imaging system and for controlling the headlamps to vary a beam pattern of the headlamps as a function of the brightness of light sources within the images; and

a user input mechanism coupled to said control circuit for allowing a user to adjust a sensitivity at which said control circuit will control the headlamps in response to light sources within the images.

41. The headlamp control system of claim 40, wherein said imaging system is disposed in a rearview mirror assembly.

42. The headlamp control system of claim 40, wherein said control circuit is disposed in a rearview mirror assembly.

43. The headlamp control system of claim 40, wherein said imaging system includes a plurality of sensors that integrate the light levels sensed during a predetermined integration time period, said control circuit adjusts the integration time period of said sensors in response to user adjustment of the sensitivity.

44. The headlamp control system of claim 40, wherein said control circuit adjusts the brightness of the headlamps when the brightness of light sources in the obtained images exceeds a threshold, said control circuit varies said threshold in response to user adjustment of the sensitivity.

45. The headlamp control system of claim 40, wherein said control circuit continuously varies the brightness of the headlamps as a function of the brightness of light sources within the images, said control circuit changes a rate at which the brightness of the headlamps is varied in response to user adjustment of the sensitivity.

46. The headlamp control system of claim 40, wherein said imaging system includes an array of pixel sensors, said control circuit being more sensitive to light sources detected within a predetermined area of the image obtained by said pixel sensor array, said control circuit varies the boundaries of said predetermined area in response to user adjustment of the sensitivity.

47. A headlamp control system for controlling the headlamps of a controlled vehicle, said headlamp control system comprising:

- an imaging system configured to image the scene forward of the controlled vehicle and to detect an ambient light level outside the vehicle; and

- a control circuit coupled to said imaging system for determining an ambient light level outside the vehicle for identifying and determining the brightness of light sources in images obtained from said imaging system, and for controlling the headlamps to vary a beam pattern of the headlamps as a function of the brightness of light sources within the images when the ambient light level is above a threshold level.

48. The headlamp control system of claim 47, wherein said imaging system includes:

- an image array sensor;

- an optical system configured to image the scene forward of the controlled vehicle onto said image array sensor; and

- an ambient light sensor for sensing the ambient light level outside the vehicle.

49. The headlamp control system of claim 48, wherein said ambient light sensor is aimed generally upward towards the sky above the vehicle.

50. The headlamp control system of claim 47, wherein said imaging system is disposed in a rearview mirror assembly.

51. The headlamp control system of claim 47, wherein said control circuit is disposed in a rearview mirror assembly.
52. A control system to control the headlamps of a vehicle comprising:
an ambient light sensor for sensing the ambient light outside of the vehicle; and
a control circuit for varying the beam pattern of daytime running lamps in response to the ambient light level sensed by said ambient light sensor.
53. The control system of claim 52, wherein said control circuit increases the brightness of the daytime running lights in response to increasing ambient brightness.
54. The control system of claim 52, wherein said ambient light sensor is disposed in a rearview mirror assembly.
55. The control system of claim 52, wherein said control circuit is disposed in a rearview mirror assembly.
56. A control system to control exterior lights of a vehicle comprising:
an image array sensor including a plurality of pixels;
an optical system configured to image the scene forward of the controlled vehicle onto said image array sensor, said optical system including a forwardmost surface; and
a control circuit for processing the image of the scene obtained from said image array sensor and for controlling the exterior lights in response to objects detected in the processed scene,
wherein said optical system includes a hydrophilic coating on said forwardmost surface.
57. The control system of claim 56, wherein said optical system is disposed in a rearview mirror assembly.
58. The control system of claim 52, wherein said control circuit is disposed in a rearview mirror assembly.

59. The control system of claim 52, wherein said optical system further includes a photocatalytic coating proximate said hydrophilic coating.

60. A vehicle control system to control the brightness of continuously variable headlamps that have a brightness that varies continuously between a high beam state and a low beam state, said control system comprising:

an imaging system configured to image the scene forward of the controlled vehicle;

a control circuit for identifying and determining the brightness of light sources in images obtained from said imaging system and for controlling the perceived brightness of the headlamps as a function of the brightness of light sources within the images; and

an indicator coupled to said control circuit and positioned inside the vehicle for indicating to the driver the relative brightness of the headlamps.

61. The vehicle control system of claim 60, wherein said indicator has a brightness that varies in proportion to the brightness of the headlamps.

62. The vehicle control system of claim 60, wherein the brightness of said indicator doubles when the headlamps are in a high beam state as a result of manual activation of the high beams.

63. The vehicle control system of claim 60, wherein said indicator changes color as a function of the brightness of the headlamps.

64. The vehicle control system of claim 60, wherein said indicator includes a scale that indicates a relative brightness of the headlamps.

65. The vehicle control system of claim 64, wherein said indicator scale is a multi-segmented display in which the number of segments that are illuminated correspond to the relative brightness of the headlamps.

66. The vehicle control system of claim 60, wherein said imaging system is disposed in a rearview mirror assembly.

67. The vehicle control system of claim 60, wherein said control circuit is disposed in a rearview mirror assembly.
68. The vehicle control system of claim 60 and further including a second indicator for indicating when said control circuit is automatically controlling the brightness of the vehicle headlamps as a function of the brightness of light sources within the images.
69. An imaging system for a vehicle comprising:
an image sensor having an array of pixels and at least one other component; and
an optical baffle disposed between said image sensor and a scene to be imaged for preventing light from the scene from reaching said at least one other component.
70. The imaging system of claim 69, wherein said image sensor is a CMOS sensor.
71. The imaging system of claim 69, wherein said image sensor is disposed in a rearview mirror assembly.
72. A control system for controlling exterior lights of a controlled vehicle, said control system comprising:
an imaging system configured to image the scene forward of the controlled vehicle;
a switching mechanism for manual input of a driver's selection of a feature affecting the control of the exterior lights; and
a control circuit coupled to said switching mechanism and said imaging system for identifying and determining the brightness of light sources in images obtained from said imaging system and for controlling the exterior lights to vary the beam pattern of the exterior lights as a function of the brightness of light sources within the images and as a function of the status of said switching mechanism.
73. The control system of claim 72, wherein the exterior lights include headlamps and said switching mechanism includes a switch that allows a driver to select manual or automatic control of the vehicle headlamps.

74. The control system of claim 72, wherein, in response to selection of automatic control using said switch, said control circuit enters an automatic control mode in which the headlamps are automatically controlled in response to the detection of light sources within the images.

75. The control system of claim 74, wherein, in response to selection of manual control using said switch, said control circuit enters a manual control mode in which the headlamps are manually controlled by the driver.

76. The control system of claim 72, wherein the exterior lights include headlamps, said switching mechanism includes a switch for manually activating high beams of the vehicle headlamps, and wherein said control circuit responds to activation of said switch by turning on the high beams.

77. The control system of claim 76, wherein said switch is a toggle switch and said control circuit maintains the high beams in an on state when said switch is toggled until such time that it is again toggled at which point said control circuit automatically controls the brightness of the high beams.

78. The control system of claim 76, wherein said switch is a flash-to-pass switch, wherein said control circuit responds to manual activation of said switch by activating high beam headlamps for so long a time as the flash-to-pass switch is held in its activation position.

79. The control system of claim 72, wherein the exterior lights include headlamps, said switching mechanism includes a toggle switch for manually activating and deactivating high beams of the vehicle headlamps, and wherein said control circuit responds to toggling of said switch by changing the on/off state of the high beams from the current status of the high beams.

80. The control system of claim 79, wherein, upon switching the on/off state of the high beams in response to toggling of said switch, said control circuit maintains the high beams in the changed state for a predetermined time period at which point said control

circuit enables automatic changing of the brightness of the high beams in response to the brightness of light sources in images obtained from said imaging system.

81. The control system of claim 72, wherein the exterior lights include headlamps, said switch is a flash-to-pass switch, and wherein said control circuit responds to manual activation of said switch by turning on the high beam headlamps for so long a time as the flash-to-pass switch is held in its activation position.

82. The control system of claim 81, wherein, when said flash-to-pass switch is released from its activation position, said control circuit turns off the high beam headlamps regardless of whether the high beams were on or off before such activation and thereafter enables automatic changing of the brightness of the high beams in response to the brightness of light sources in images obtained from said imaging system.

83. The control system of claim 72, wherein said imaging system is disposed in a rearview mirror assembly.

84. The control system of claim 72, wherein said control circuit is disposed in a rearview mirror assembly.

85. A headlamp control system for a vehicle comprising:
a control circuit coupled to the vehicle headlamps for fading the headlamps of the vehicle to an off state in response to the turning off of the vehicle ignition.

86. The headlamp control system of claim 85, wherein said control circuit begins to fade the vehicle headlamps upon detecting the exit of the driver.

87. The headlamp control system of claim 85, wherein said control circuit begins to fade the vehicle headlamps upon detecting the exit of the last occupant to leave the vehicle.

88. The headlamp control system of claim 85 and further comprising an imaging system configured to image the scene forward of the controlled vehicle, wherein said control circuit is coupled to said imaging system for identifying and determining the

brightness of light sources in images obtained from said imaging system and for controlling the beam pattern of the headlamps as a function of the brightness of light sources within the images.

89. The headlamp control system of claim 85, wherein said control circuit is disposed in a rearview mirror assembly.

90. A control system to control exterior lights of a vehicle comprising:
an image array sensor including a plurality of pixels;
an optical system configured to image the scene forward of the controlled vehicle onto said image array sensor, said optical system including a forwardmost surface; and
a control circuit for processing the image of the scene obtained from said image array sensor and for controlling the exterior lights in response to objects detected in the processed scene,
wherein said optical system includes a photocatalytic coating on said forwardmost surface.

91. The control system of claim 90, wherein said optical system is disposed in a rearview mirror assembly.

92. The control system of claim 90, wherein said control circuit is disposed in a rearview mirror assembly.

93. A control system to control the headlamps of a vehicle comprising:
a manually actuated switch mechanism for receiving input from a driver to temporarily increase the brightness of the vehicle headlamps in a flash-to-pass state;
an ambient light sensor for sensing the ambient light outside of the vehicle; and
a control circuit coupled to said ambient light sensor and said manually actuated switch mechanism for varying the beam pattern of the headlamps during a flash-to-pass state in response to the ambient light level sensed by said ambient light sensor.

94. The control system of claim 93, wherein said ambient light sensor is disposed in a rearview mirror assembly.

95. The control system of claim 93, wherein said control circuit is disposed in a rearview mirror assembly.

96. A control system to control the headlamps of a vehicle, the vehicle having a microwave receiver for receiving signals from satellites, said control system comprising:
a control circuit for receiving signals from the microwave receiver indicative of the location of the vehicle, said control circuit controls the headlamps to limit the perceived brightness of the headlamps from exceeding a predetermined level less than their capacity when the vehicle is traveling on a residential street.

97. The control system of claim 96 and further comprising an imaging system configured to image the scene forward of the controlled vehicle, wherein said control circuit identifies and determines the brightness of light sources in images obtained from said imaging system and for controlling the headlamps to vary the perceived brightness of the headlamps as a function of the brightness of light sources within the images.

98. An imaging device assembly for a vehicle having a windshield, said assembly comprising:
a mounting structure configured for mounting to a vehicle in a fixed position relative to the windshield;
an imaging device; and
a support structure, said imaging device carried by said support structure, said support structure being attached to said mounting structure to allow positional adjustment of said support structure and said imaging device relative to the windshield.

99. The imaging device assembly of claim 98 and further including a housing secured to said mounting structure, said support structure and said imaging device being disposed in said housing.

100. The imaging device assembly of claim 99, wherein both said housing and said support structure being attached to said mounting structure such that positional adjustment of said support structure may be performed without changing the position of said housing relative to said mounting structure.

101. The imaging device assembly of claim 98, wherein said mounting structure is a rearview mirror assembly mounting structure.

102. The imaging device assembly of claim 101, wherein said rearview mirror assembly mounting structure is configured for securing a rearview mirror assembly to a vehicle windshield.

103. A sky sensor assembly for sensing light in the sky above a vehicle, said assembly comprising:

a housing configured for mounting to the vehicle;

a light sensor disposed within said housing;

a light pipe extending from said light sensor to an aperture formed in said housing that is directed upward towards the portion of the sky from which light is to be sensed.

104. The sky sensor assembly of claim 103, wherein said housing is a component of a rearview mirror assembly.

105. The sky sensor assembly of claim 104, wherein said housing is an accessory housing mounted to a mounting structure for a rearview mirror assembly.

106. The sky sensor assembly of claim 103 and further including a circuit board that is disposed vertically within said housing, wherein said light sensor is mounted to said circuit board.

107. The sky sensor assembly of claim 106, wherein an image sensor is mounted to said circuit board for sensing images forward of the vehicle.

108. A control system for controlling exterior lights of a controlled vehicle, said control system comprising:

an image sensor to detect light sources in a scene forward of the controlled vehicle;

and

a control circuit coupled to said image sensor, said control circuit being operable to distinguish vehicle light sources from non-vehicle light sources, to distinguish between headlamps and tail lights based upon the color of the light, to detect movement of detected

vehicles, and to generate a control signal to cause the exterior vehicle lights to provide a selected illumination pattern, whereby the control signal is derived as a function of both the movement of any detected vehicles and the color of the light emanating from such vehicles.

109. The control system of claim 108, wherein the control signal is further derived as a function of any one or combination of the following parameters detected with respect to a detected light source: an AC component; brightness; relative position; and relative size.

110. The control system of claim 108, wherein the control signal is further derived as a function of any one or combination of the following parameters: turn rate of the controlled vehicle; speed of the controlled vehicle; and ambient brightness.

111. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

- receiving pixel levels from the image sensor;
- identifying at least one group of pixels that is associated with a light source;
- analyzing the associated pixels to determine if at least one condition exists; and
- selectively generating a headlamp control signal in accordance with the results of the analysis.

112. The method of claim 111, wherein the step of identifying a group of pixels associated with a single light source identifies a plurality of pixels meeting a pixel criteria.

113. The method of claim 112, wherein the step of identifying a group of pixels identifies a contiguous group of pixels meeting a pixel criteria.

114. The method of claim 111, wherein the step of analyzing identifies the centroid of at least one group of pixels.

115. The method of claim 111, wherein the step of analyzing determines the size of at least one group of pixels.

116. The method of claim 115, wherein the condition is whether the light source size is greater than a threshold size.

117. The method of claim 116, wherein a further condition is the average level of the pixel levels, and wherein the headlamps are not controlled responsive to a group of pixels that is greater than the threshold size if the average pixel level in that group of pixels is less than an average pixel level threshold.

118. The method of claim 111, wherein the step of analyzing includes determining the total pixel level for at least one group of pixels.

119. The method of claim 118, where the total pixel level is the sum of the gray scale values for all of the pixels in a group of pixels.

120. The method of claim 118, where the condition is that the total pixel level exceeds a threshold total pixel level.

121. The method of claim 120, further including a threshold total pixel level for the headlamps and a threshold total pixel level for tail lights.

122. The method of claim 111, wherein the step of analyzing includes determining the average pixel level for at least one group of pixels.

123. The method of claim 120, wherein the condition is a threshold average pixel level, and the controller ignores certain light sources where the average pixel level for the group of pixels is below the average pixel level.

124. The method of claim 112, wherein the step of identifying a plurality of pixels meeting a pixel criteria identifies individual pixels having levels above a pixel threshold level.

125. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;
analyzing an image input with red filtering to identify objects of interest;
analyzing an image input without red filtering in those areas where objects were identified in the step of analyzing with red filtering; and
selectively generating a headlamp control signal in accordance with the results of the steps of analyzing.

126. The method of claim 125, further including the step of comparing pixels levels in the image generated with red filtering to pixel levels in the image generated without red filtering for each of the objects of interest.

127. The method of claim 125, wherein the step of analyzing an image input with red filtering includes identifying groups of contiguous pixels meeting a threshold criteria to identify objects.

128. The method of claim 127, wherein the step of analyzing an image input without red filtering includes searching for groups of contiguous pixels in areas corresponding to objects identified in the step of analyzing an image input without red filtering.

129. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;
determining a vehicle speed criteria;
analyzing an image input from the image sensor according to the speed criteria;
and
selectively generating a headlamp control signal in accordance with the results of the steps of analyzing.

130. The method of claim 129, wherein the speed criteria is whether the vehicle brakes are actuated.

131. The method of claim 129, wherein the speed criteria is whether the vehicle is traveling at highway speeds.

132. The method of claim 129, wherein the step of analyzing includes changing the size of the scene viewed by the image sensor as a function of the vehicle speed.

133. The method of claim 132, wherein the speed above which the scene is enlarged is higher than the speed below which the scene is decreased.

134. The method of claim 129, wherein the step of analyzing includes preventing the high beams from coming on if the vehicle speed is below a threshold level.

135. The method of claim 129, wherein the step of selectively generating a control signal comprises fading the high beams off as the vehicle decelerates to a stop.

136. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;

receiving an ambient light level from an ambient light sensor;

analyzing an image input from the image sensor according to the ambient light level to selectively generate a headlamp control signal in accordance with the results of the analysis, wherein daytime running lights are enabled when the ambient light level is above a first threshold, low beam headlamps are enabled when the ambient light level is below the first threshold, and the low beam headlamps and high beam headlamps are enabled when the ambient light level is below a second threshold, and wherein the high beam headlamps are controlled automatically responsive to the pixel levels from the image sensor.

137. The method of claim 136, further including controlling one or more fog lights responsive to the ambient light sensor and the image sensor.

138. The method of claim 137, wherein the step of controlling includes evaluating the pixels of the image sensor to determine if they meet a fog criteria if the ambient light level measured by the ambient light sensor is within a predetermined range.

139. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;

determining the number of objects in the image;

analyzing the image input from the image sensor to determine the number of objects in the image; and

selectively generating a headlamp control signal in accordance with the results of the steps of analyzing, wherein high beam headlamp operation is at least partially inhibited if the number of objects determined exceeds an object threshold.

140. The method as defined in claim 139, wherein the step of analyzing the image to detect objects monitors the frequency of occurrence of objects within a predetermined period.

141. The method as defined in claim 140, wherein the predetermined period is a predetermined number of frames.

142. The method as defined in claim 140, wherein the step of selectively generating includes inhibiting operation of the high beams when the number of objects exceeds a predetermined number.

143. The method as defined in claim 139, wherein the step of selectively generating includes inhibiting operation of the high beams when the number AC light source objects exceeds a threshold.

144. The method as defined in claim 139, wherein turning ON the high beam headlamps is inhibited if the number of objects determined exceeds an object threshold.

145. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;

analyzing the image input from the image sensor to determine the number of objects in the image; and

selectively generating a headlamp control signal in accordance with the results of the steps of analyzing, wherein the vehicle headlamps are not adjusted responsive to detection of an object unless it appears in a threshold number of frames.

146. The method of claim 145, wherein the threshold number of frames is proportional to the brightness of the objects detected.

147. The method of claim 145, wherein the brighter the object detected, the smaller will be the threshold number of frames.

148. The method of claim 145, wherein the brightness of the headlamps are gradually altered after an object is detected for the threshold number of frames.

149. The method of claim 148, wherein after an object is detected for the threshold number of frames, the high beams may be adjusted responsive to each successive frame in which the object appears.

150. The method of claim 145, wherein the headlamp brightness is increased after the image clears for the threshold number of frames.

151. The method of claim 145, wherein the headlamp brightness is dimmed after an object is detected in the image for the threshold number of frames.

152. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;

analyzing the image input from the image sensor using a spatial look-up table, the spatial look-up table having different thresholds for different pixels based on their pixel location; and

selectively generating a headlamp control signal in accordance with the results of the steps of analyzing, wherein the vehicle headlamps are controlled responsive to those pixels from the image sensor exceeding its respective threshold.

153. The method of claim 152, further including the step of shifting the pixels associated with the values stored in the spatial look-up table as the vehicle changes direction.

154. The method of claim 153, wherein the step of shifting the pixels includes shifting the pixels responsive to operation of the vehicle steering system.

155. The method of claim 153, wherein the step of shifting the pixels includes shifting the pixels responsive to a global positioning system input.

156. The method of claim 153, wherein the step of shifting the pixels includes shifting the pixels responsive to a compass input.

157. The method of claim 151, wherein the spatial look-up table has values which render the image sensor more sensitive to one side of the car than the other side of the car.

158. The method of claim 157, wherein the image sensor is more sensitive to the side of the car on which the driver sits.

159. The method of claim 151, wherein thresholds are dynamic such that if one pixel has a light level that is above its respective threshold, and the look-up table has a higher threshold for the adjacent pixel, the adjacent pixel will be compared to the lower of threshold said one pixel.

160. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

- receiving pixel levels from the image sensor;
- identifying pixels associated with a light source;
- analyzing the pixels; and

selectively generating a headlamp control signal in accordance with the results of the analysis, wherein the system is more sensitive when high beams are ON than when the high beams are OFF.

161. The method of claim 160, wherein the sensitivity is adjusted by increasing the integration period for the image sensor when the high beams are ON.

162. The method of claim 160 wherein the sensitivity is adjusted by using different spatial look-up tables when the high beams are OFF and ON, wherein the spatial look-up table stores respective thresholds.

163. The method of claim 160, wherein the field of view of the image sensor is broader when the high beams are OFF than when the high beams are ON.

164. The method of claim 160, wherein the off-axis sensitivity is increased when the high beams are ON.

165. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;

identifying pixels that are associated with an object;

analyzing the associated pixels and storing information associated with at least one detected object; and

selectively generating a headlamp control signal in accordance with the results of the analysis.

166. The method of claim 165, wherein the stored information includes the brightness of at least one object detected.

167. The method of claim 166, wherein the stored information includes the location of at least one object detected.

168. The method of claim 165, wherein the stored information includes the locations and brightness of the brightest object detected.

169. The method of claim 168, wherein if the present frame is determined to be clear of light sources, and the previous frame is determined to a bright light source, and the high beams are OFF, the high beams are controlled to produce a fast return to bright.

170. The method of claim 169, wherein the control of the high beams to produce a fast return includes an expedited fade to bright.

171. The method of claim 169, wherein the control of the high beams to produce a fast return comprises turning the high beams ON without delay.

172. The method of claim 165, wherein if the present frame is determined to be clear of light sources, and the previous frame is determined to have contained vehicle tail lights, and the high beams are OFF, the high beams are controlled to produce a tail light delayed return to bright.

173. The method of claim 172, wherein the tail light delayed return to bright is longer than a return to bright following detection of headlamps from an oncoming vehicle.

174. The method of claim 172, wherein the tail light delayed return to bright is variable.

175. The method of claim 172, wherein the tail light return to bright is dependent on the detection of glare light.

176. The method of claim 175, wherein the high beams are turned on when glare is detected.

177. The method of claim 176, wherein if glare is not detected in a maximum threshold time after detecting the cleared image, the brights are turned ON even if glare has not been detected.

178. A method of automatically calibrating the aim of an image sensor in a controlled vehicle, comprising the steps of:

- detecting a distant light of an oncoming vehicle;
- detecting a straight road condition; and
- generating a new average value from the location of the distant oncoming light averaged with a stored average if the straight road condition is detected, and
- storing the new average value as the stored average signal.

179. The method of claim 178, wherein the step of detecting a distant light comprises detecting a faint light near the center of the image sensor.

180. The method of claim 178, wherein the step of detecting a straight road detects the lateral movement of the controlled vehicle over a period of time.

181. The method of claim 180, wherein the period of time is from the time that the distant light is detected until a time period after the distant vehicle and the controlled vehicle have passed.

182. The method of claim 178, further including the step of detecting elevation change of the controlled vehicle.

183. The method of claim 180, wherein lateral movement is detected by determining the lateral movement of the distant headlamp.

184. The method of claim 180, wherein lateral movement is detected using a global positioning system.

185. The method of claim 180, wherein lateral movement is detected from a compass.

186. The method of claim 180, wherein lateral movement is detected from operation of the steering system.

187. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor;

analyzing the pixel levels associated with a scene, wherein the analysis is altered when the vehicle turns; and

selectively generating a headlamp control signal in accordance with the results of the analysis.

188. The method of claim 187, wherein the image analyzed is shifted when the vehicle turns.

189. The method of claim 187, wherein the image analyzed is shifted when the vehicle turn signal is actuated.

190. The method of claim 187, wherein the analysis of the image is altered when the vehicle heading as detected from a compass is altered.

191. The method of claim 189, wherein the analysis is altered after actuation of the vehicle brakes following actuation of the vehicle's turn signal.

192. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged and a controller to generate headlamp control signals, the method comprising the steps of:

receiving pixel levels from the image sensor, wherein the pixel levels are stored while the vehicle headlamps are off;

analyzing the pixels to detect objects; and

selectively generating a headlamp control signal in accordance with the results of the analysis.

193. The method of claim 192, wherein the vehicle includes semiconductor radiation emitter light source, wherein the light is flashed off for a very short interval.

194. The method of claim 193, wherein the off interval is less than 60 ms.

195. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged through a variable filter and a controller to generate headlamp control signals, the method comprising the steps of:

- receiving pixel levels from the image sensor when the variable filter is filtering light of at least a first wavelength;

- receiving pixel levels from the image sensor through the variable filter when the variable filter is not filtering light of at least the first wavelength;

- analyzing the associated pixels to identify objects; and

- selectively generating a headlamp control signal in accordance with the results of the analysis.

196. A method of automatically controlling vehicle headlamps in a system comprising an image sensor generating a plurality of pixel levels from a scene being imaged through a windshield, a windshield wiper for clearing the windshield, and a controller to generate headlamp control signals, the method comprising the steps of:

- receiving signals indicative of the location of the windshield wiper;

- receiving pixel levels from the image sensor when the windshield wiper is not in front of the image sensor;

- analyzing the associated pixels to identify objects; and

- selectively generating a headlamp control signal in accordance with the results of the analysis.

197. The method of claim 196, further including the step of monitoring the window using an image sensor focused on the window to detect the presence of the windshield wiper in the field of view of the image sensor for detecting objects.

198. The method of claim 196, further including the step of monitoring the windshield wipers to detect their position.

199. A vehicle system, comprising:

- an image sensor for detecting lights;

- an ambient light sensor;

a glare sensor;
an electrochromic element for controlling the reflectivity of a mirror;
headlamps; and

a controller coupled to the image sensor, the ambient light detector, the glare sensor, the electrochromic element, and the headlamps, wherein the controller is operable to control the headlamps responsive to the image sensor and the ambient light sensor, and the controller being further operable to control the transmittance of the electrochromic element responsive to the ambient light sensor and the glare sensor.

200. The vehicle system of claim 199, wherein at least one of said controller, glare sensor, ambient light sensor, and image sensor are supported by a rearview mirror assembly of the vehicle.

201. A method of operating an image sensor generating a plurality of pixel levels from a scene being imaged, the method comprising the steps of:

receiving pixel levels from the image sensor;
identifying a bad pixel if a pixel continuously detects light when adjacent pixels do not detect light; and
selectively compensating for the identified pixels.

202. The method of claim 201, wherein the step of identifying a pixel that continuously detects light comprises determining that the pixel detects light over a predetermined number of frames.

203. The method of claim 202, wherein the step of identifying includes detecting when a pixel detects light above a pixel threshold over a predetermined number of frames and adjacent frames do not detect light above a pixel threshold over the predetermined number of frames.

204. The method of claim 201, wherein the step of selectively compensating comprises generating an average of the adjacent pixels and substituting the generated average for the pixel level measurement of the bad pixel.

205. A vehicle system, comprising:

an image sensor focused at a distance for detecting lights;

an image sensor focused near the window;

windshield wipers;

headlamps; and

a controller coupled to the image sensor, the ambient light detector, the image sensor focused near the window, the windshield wipers, and the headlamps, wherein the controller is operable to control the headlamps responsive to the image sensor, control the windshield wipers to operate when rain is on the window, and the controller being further operable to control the image sensor to image a scene when the windshield wipers are not in front of the image sensor focused at a distance.

206. A method of making an optical sensor assembly package including an image sensor die comprising the steps of:

covering the die with an epoxy;

positioning an adhesive on the epoxy;

positioning a lens structure on the adhesive; and

curing the adhesive to form the integral package.

207. The method of claim 206, further including the step of molding the lens structure to include a lens.

208. The method of claim 207, further including the step of molding the lens structure to include a first lens having a filter for removing light of at least a first wave length.

209. The method of claim 208, further including the step of molding the lens structure to include a second lens passing at least light of the first wave length.

210. The method of claim 206, wherein the step of covering includes covering the die with a glob-top epoxy.

211. The method of claim 206, further including the step of applying at least one filter to the surface of the image sensor die.

212. The method of claim 211, wherein the step of applying at least one filter includes applying two or more filters to respective areas on the surface of the sensor.

213. The method of claim 206, further including the step of mounting an electronically controlled filter.

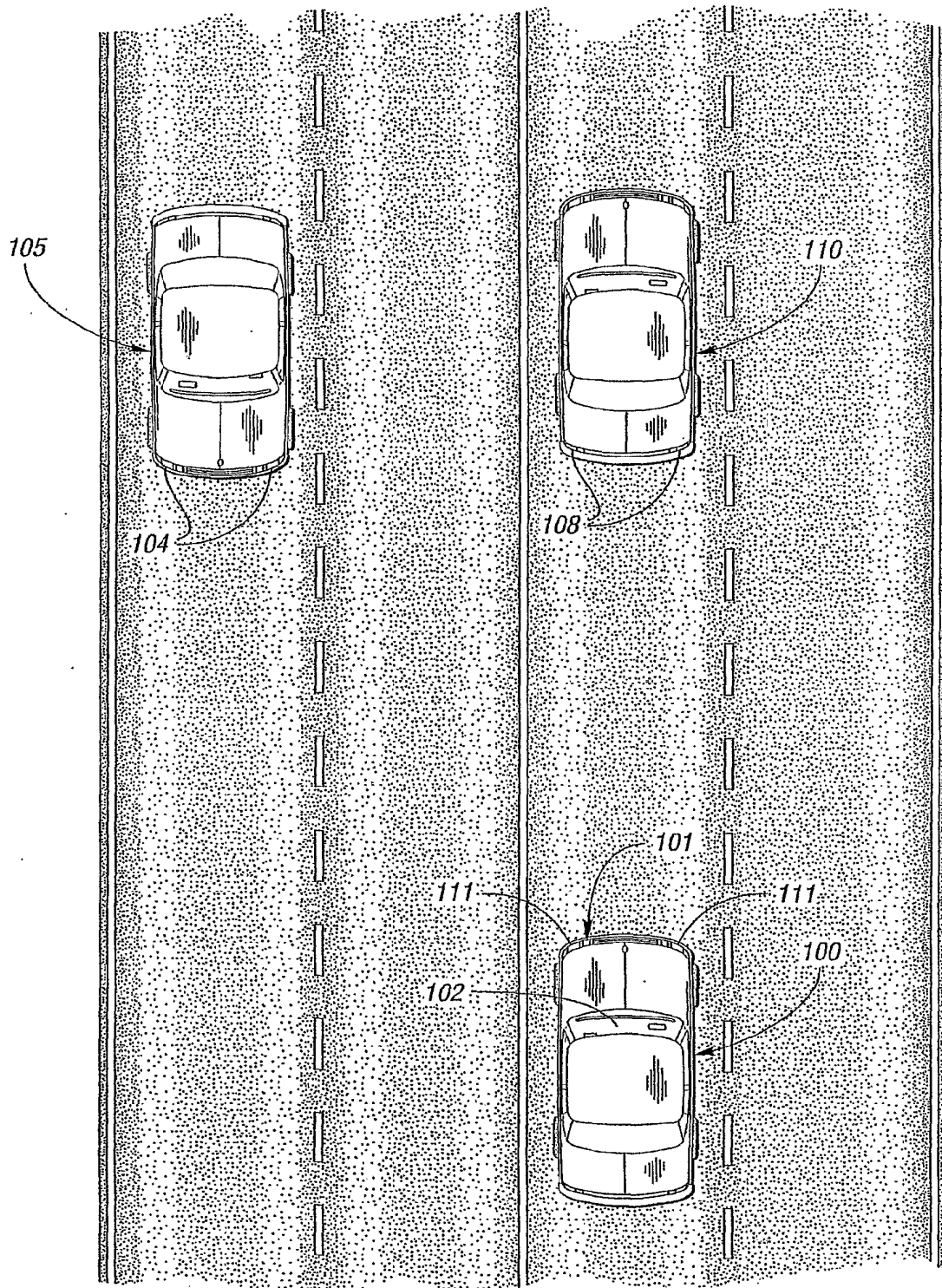
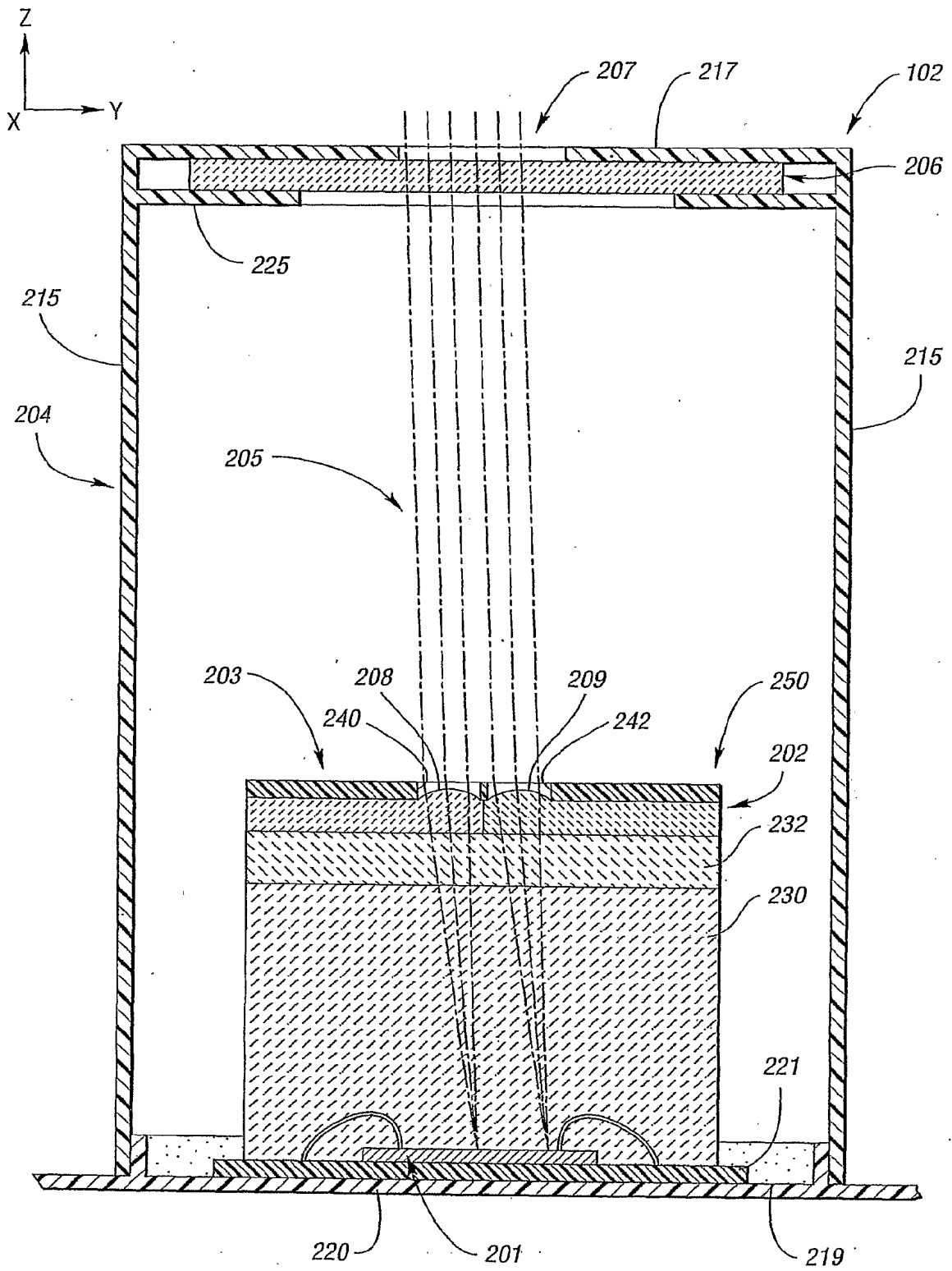


Fig. 1

*Fig. 2a*

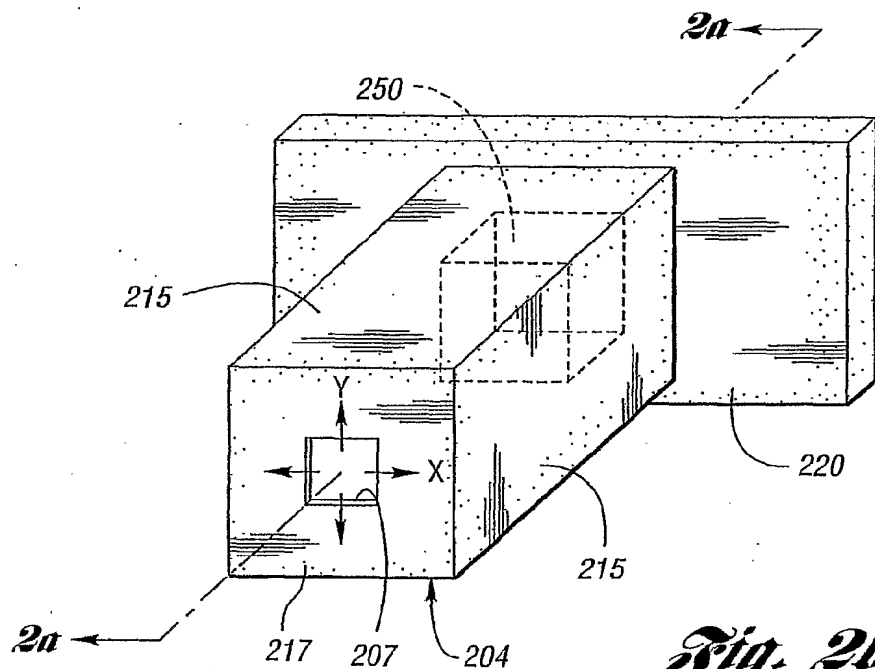


Fig. 2b

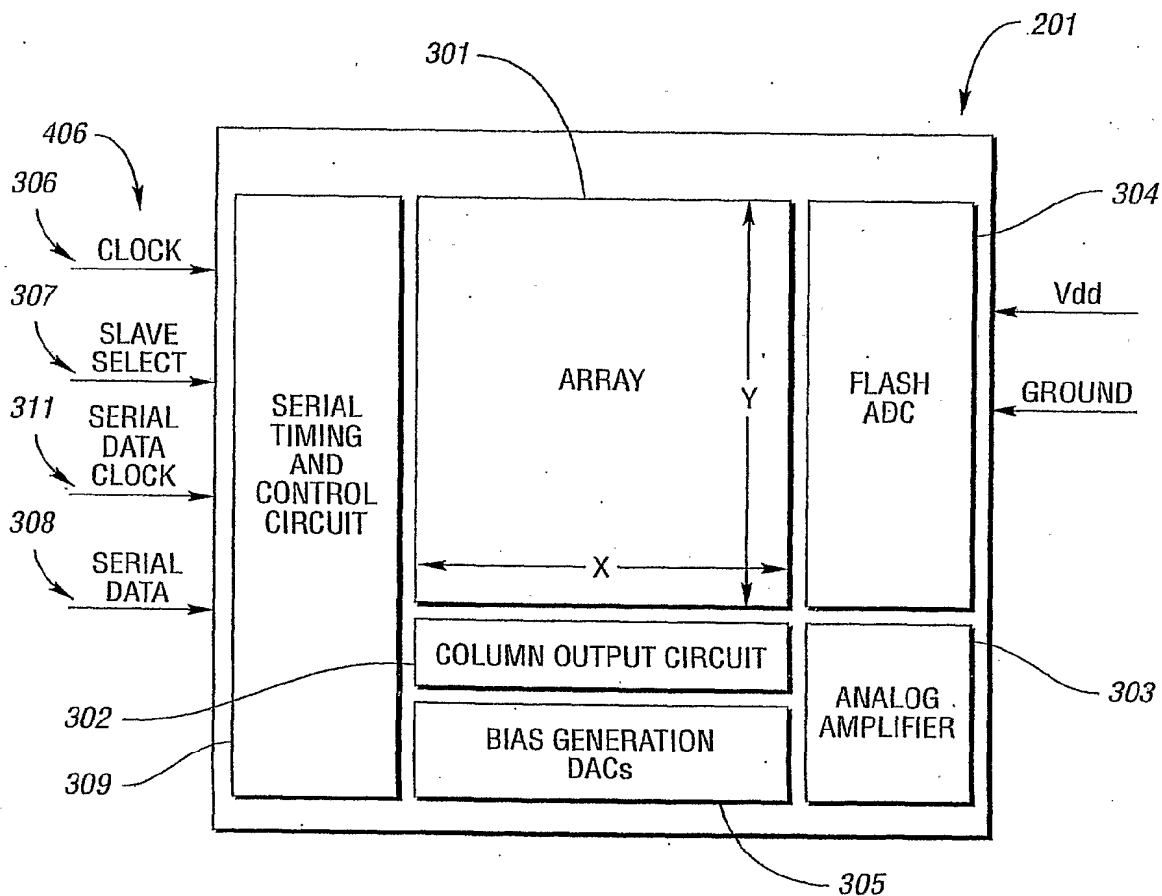


Fig. 3

Fig. 4

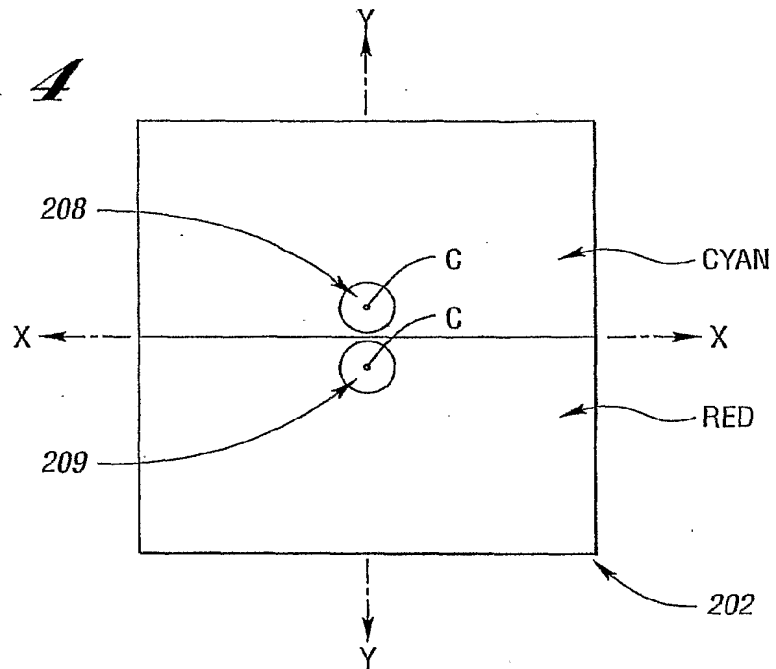


Fig. 5

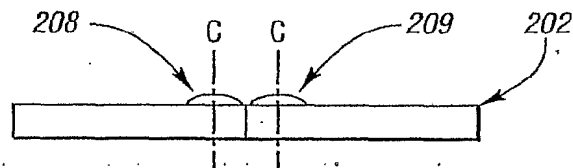
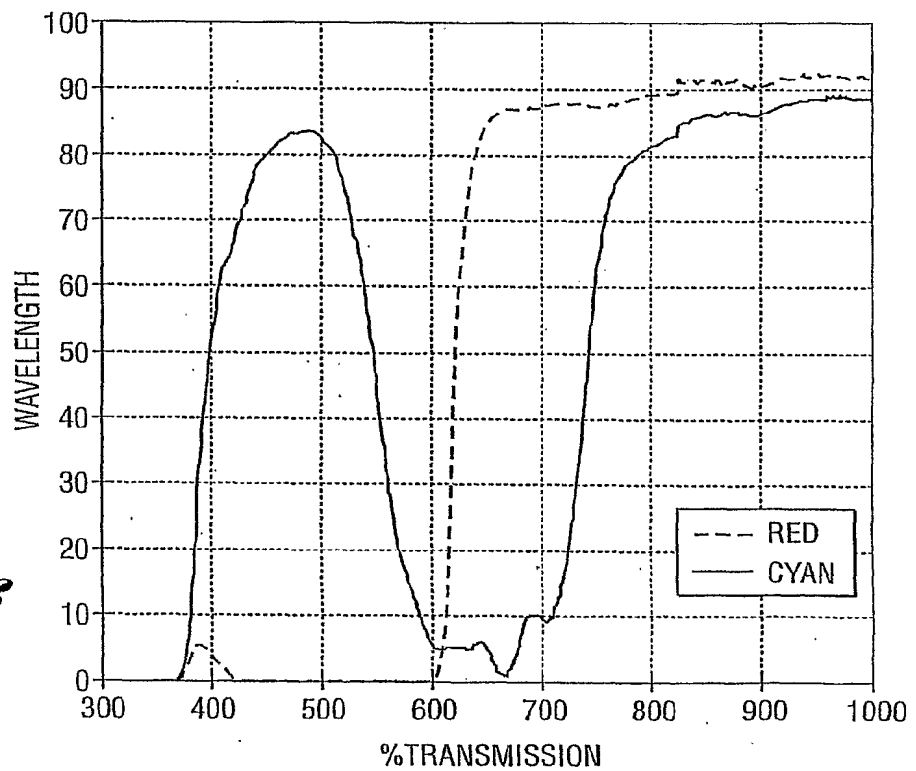
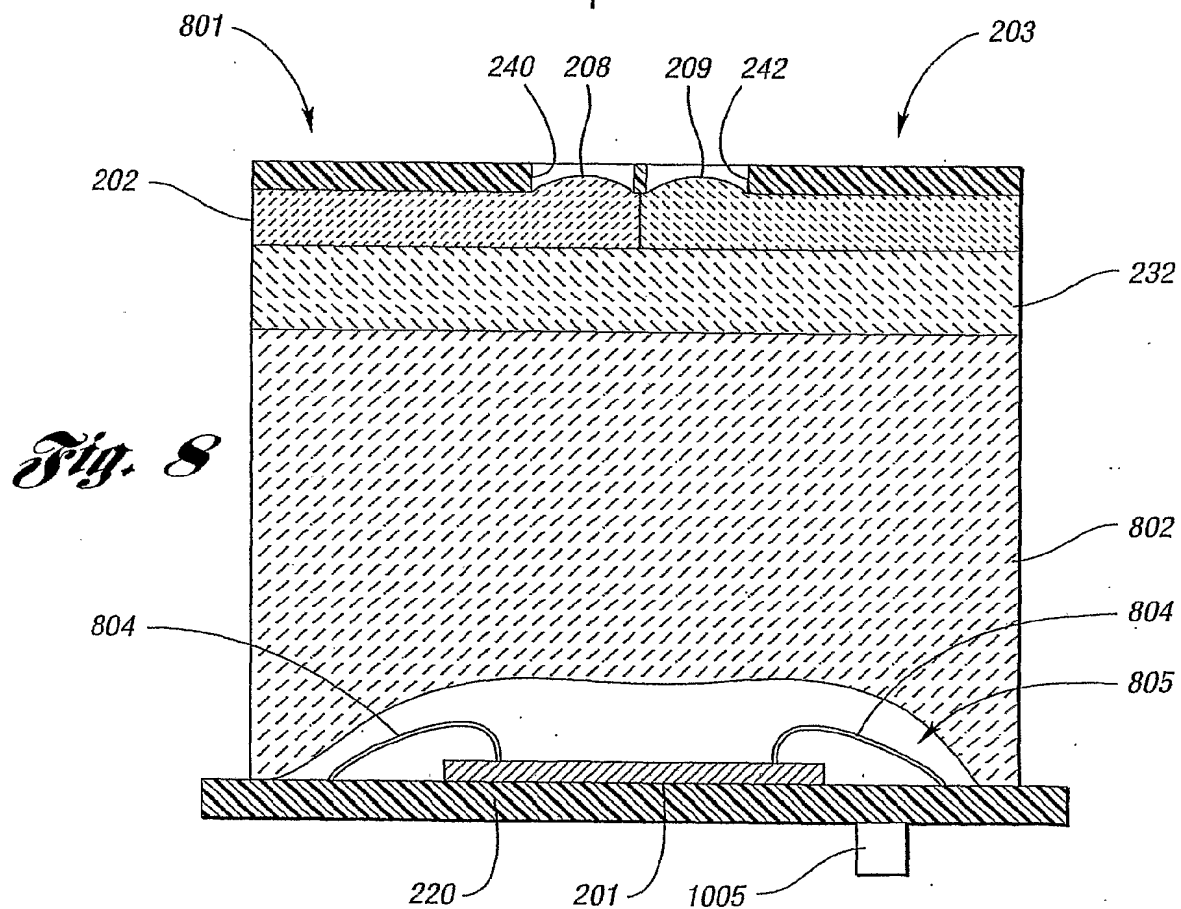
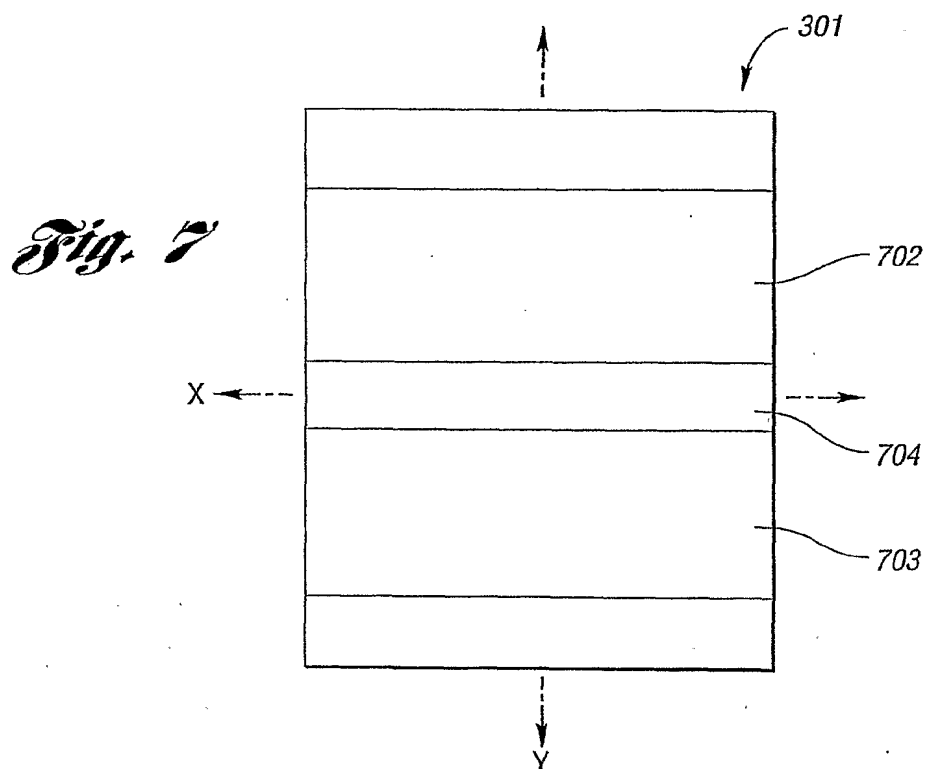
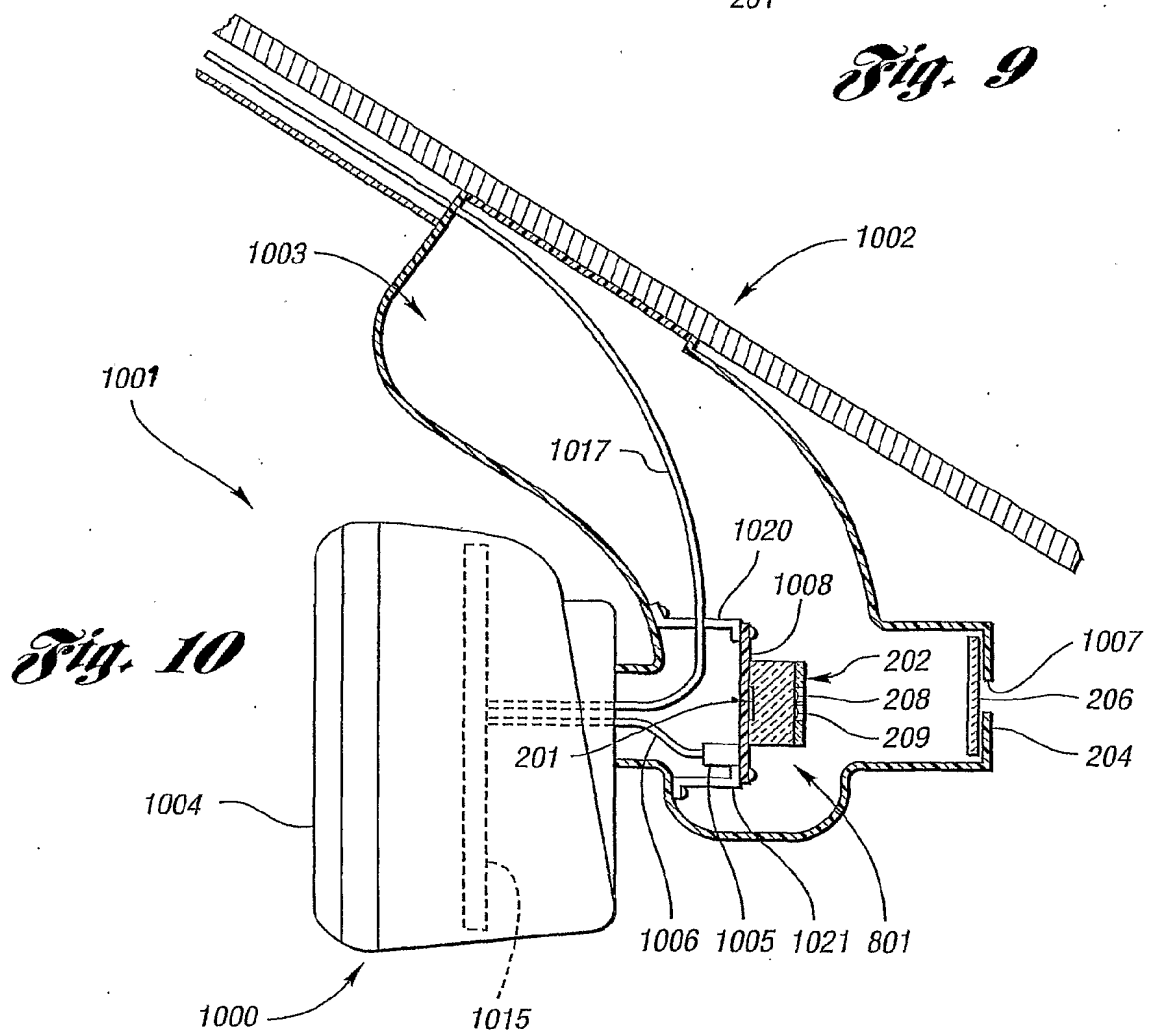
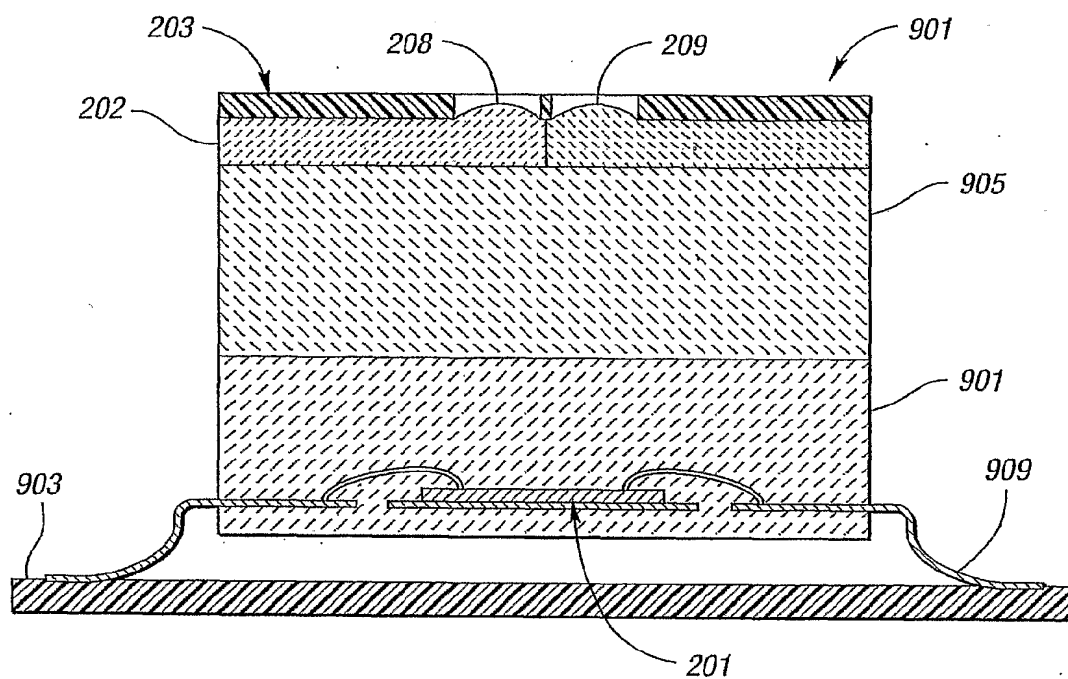
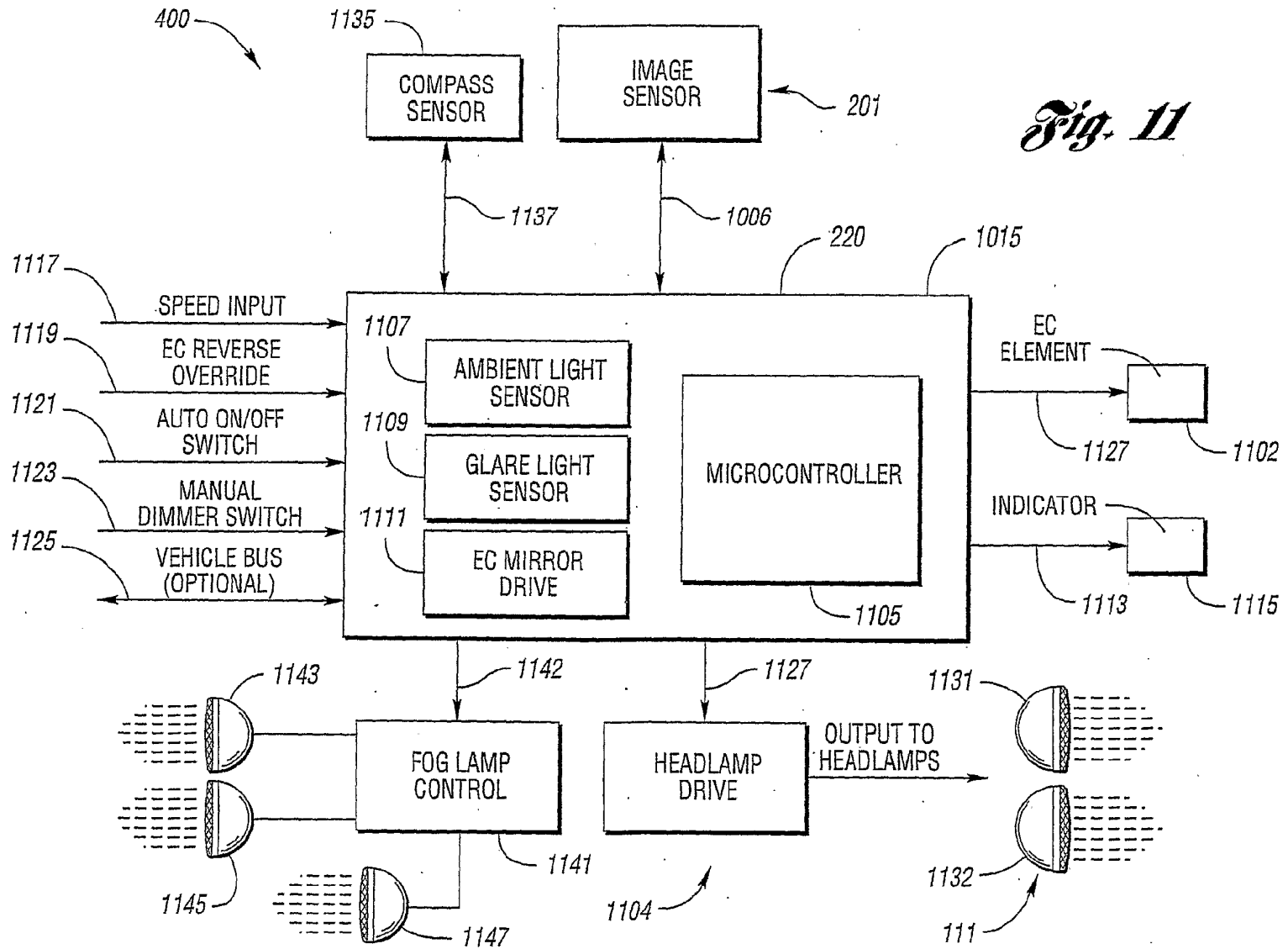


Fig. 6









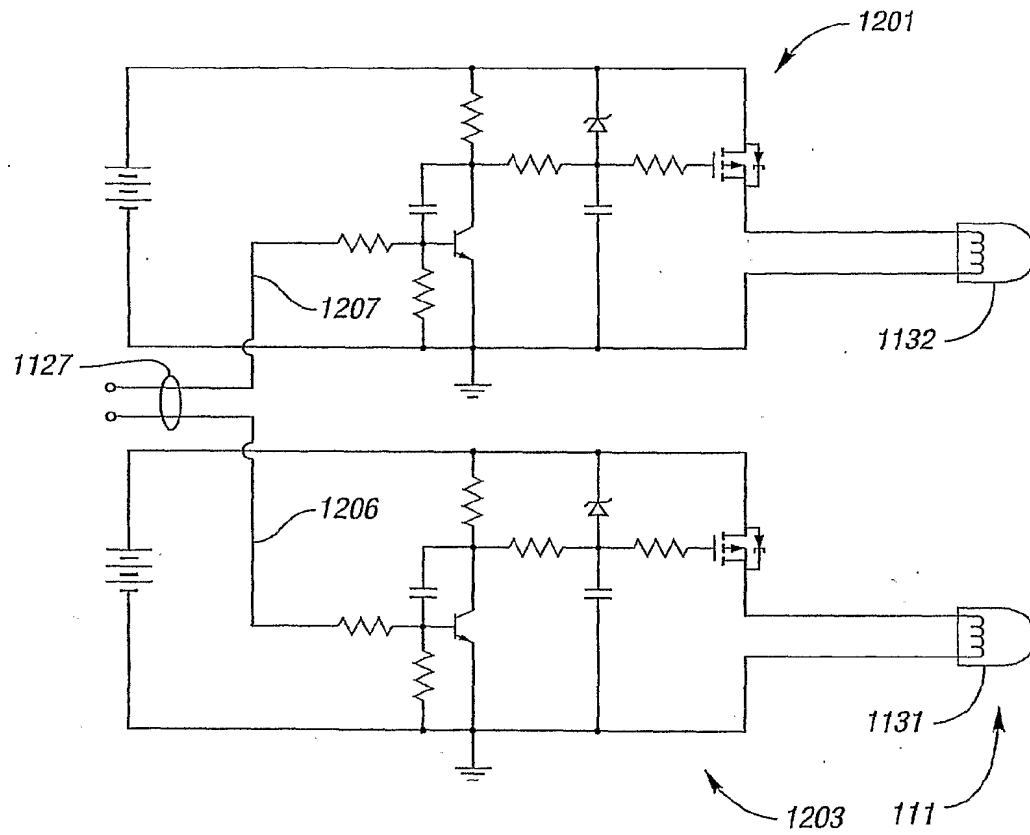
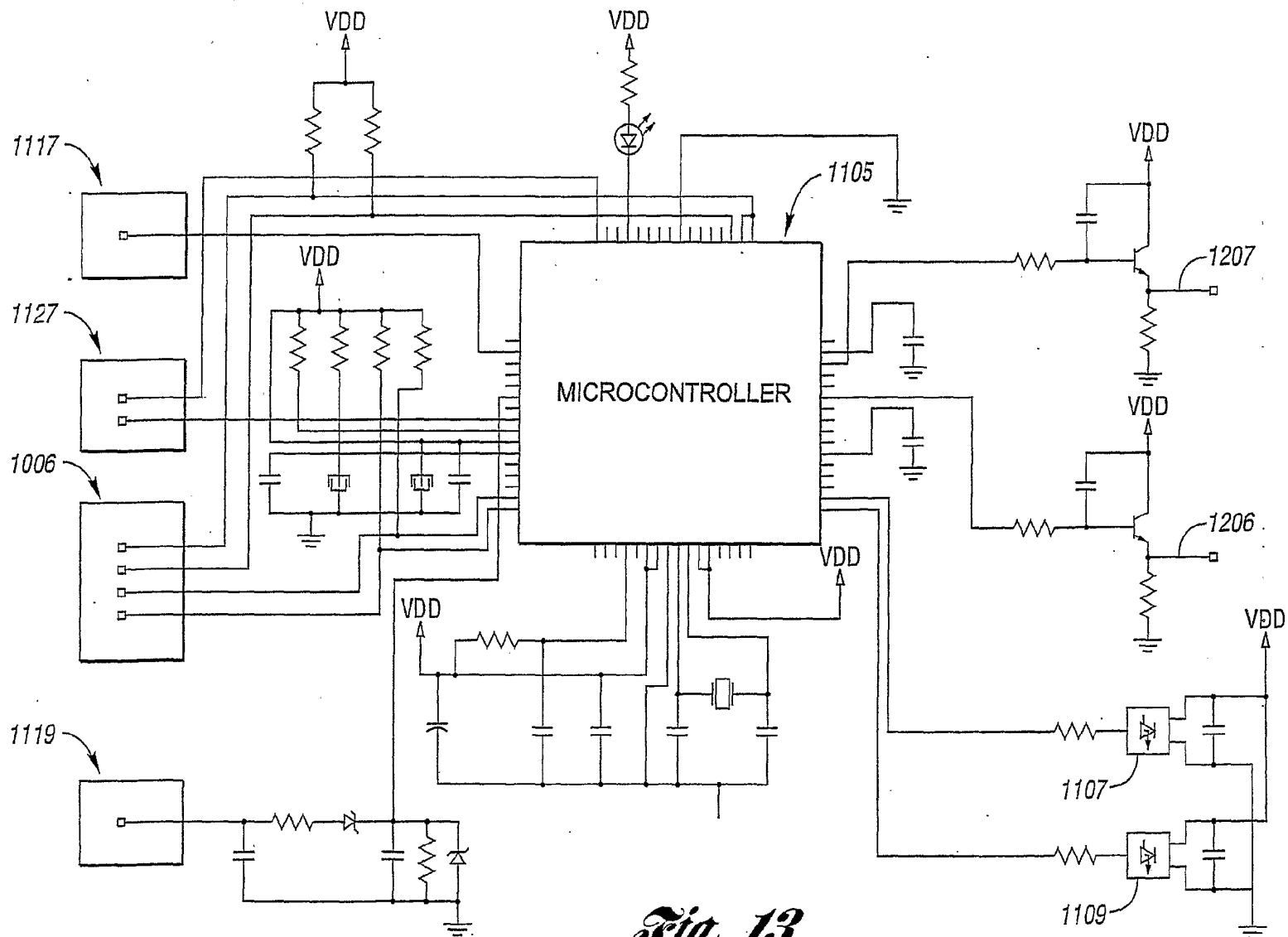
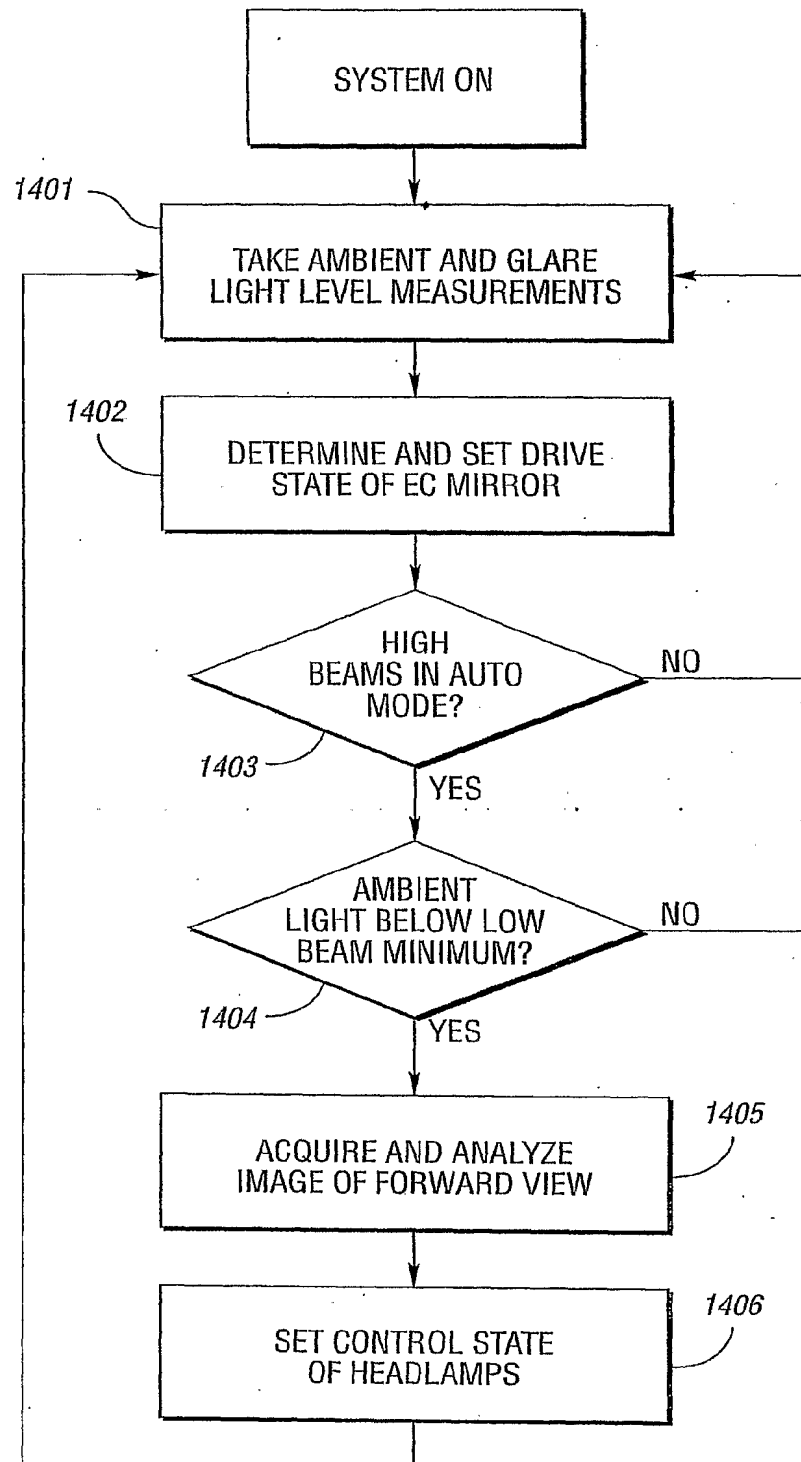
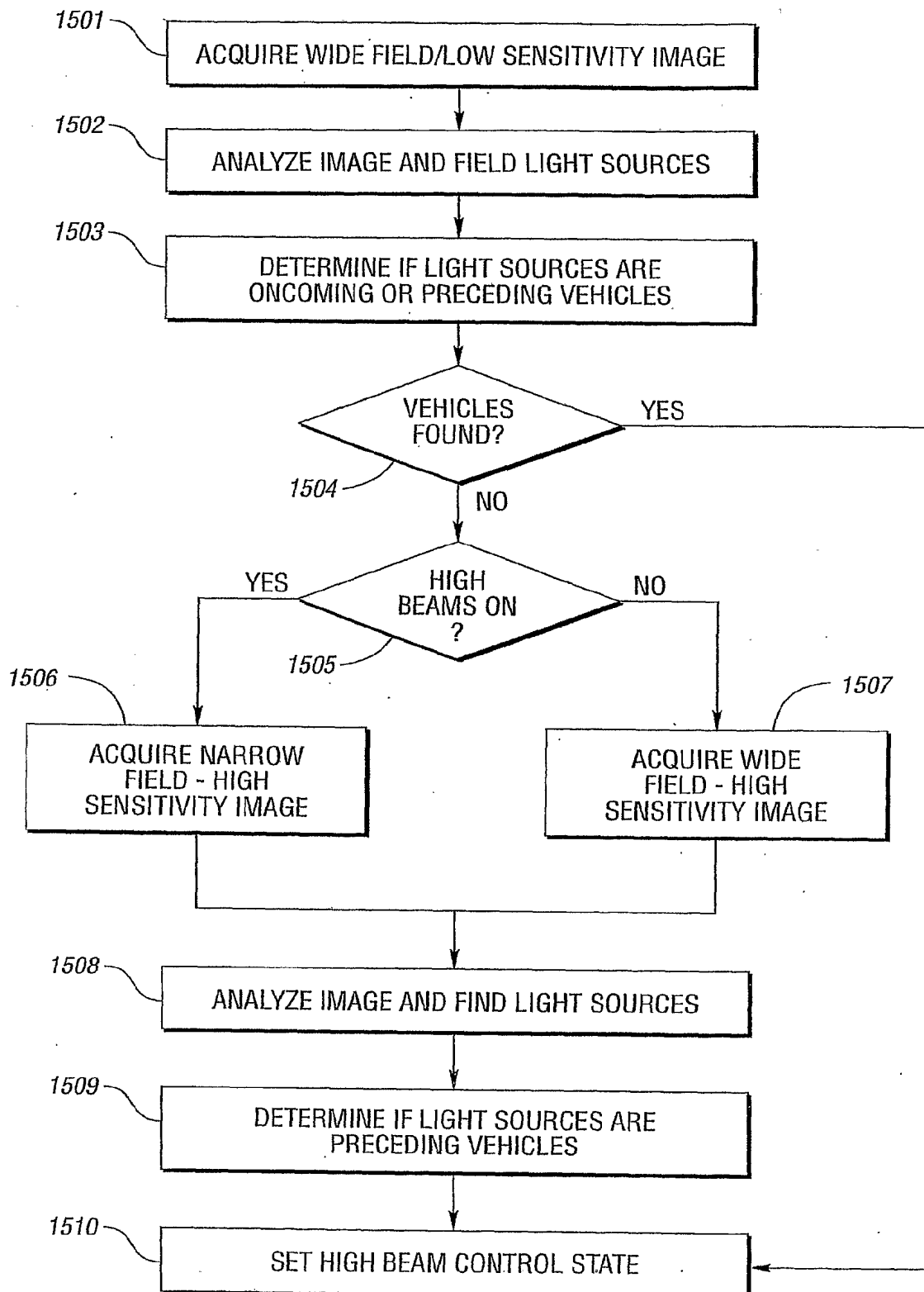
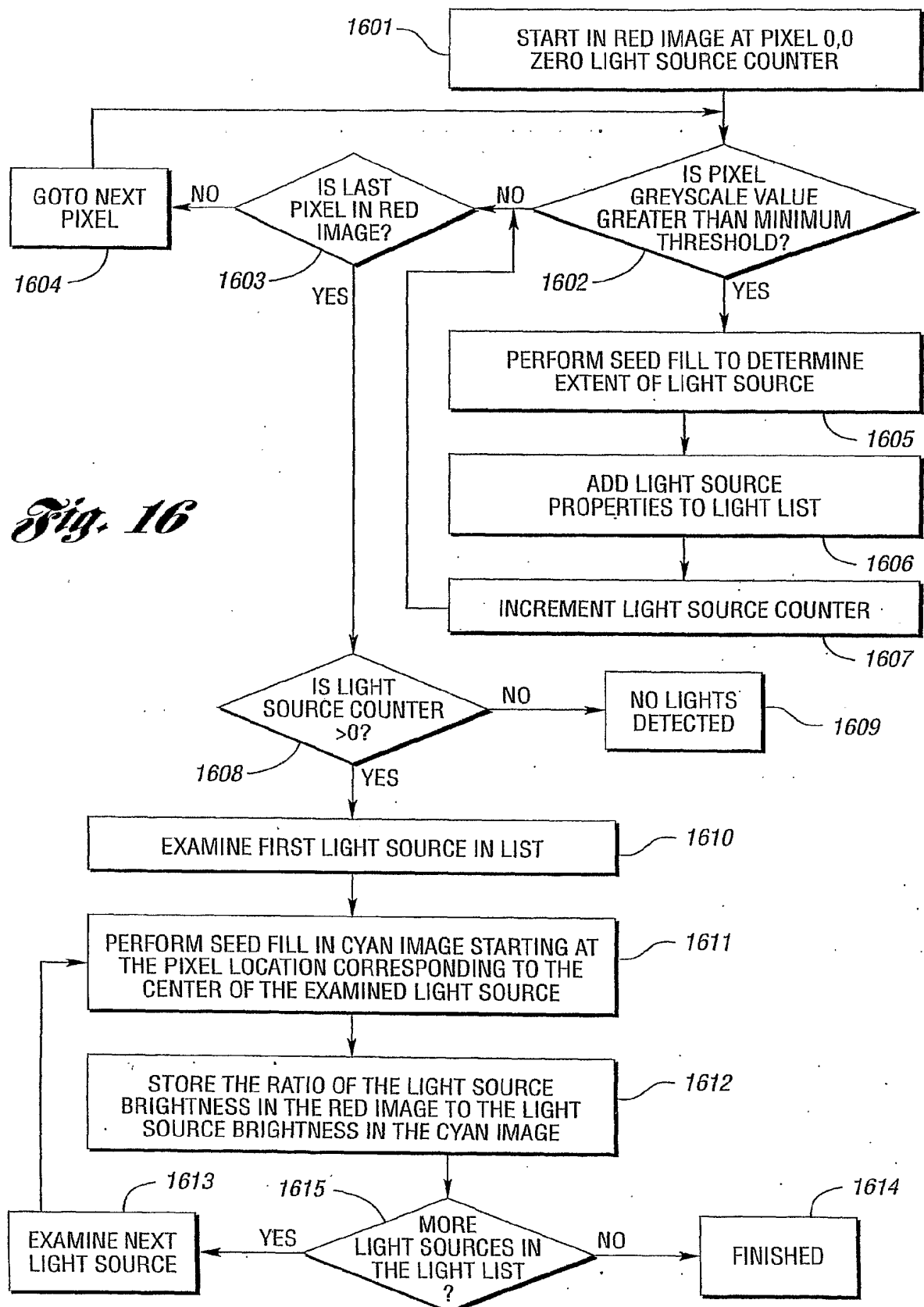


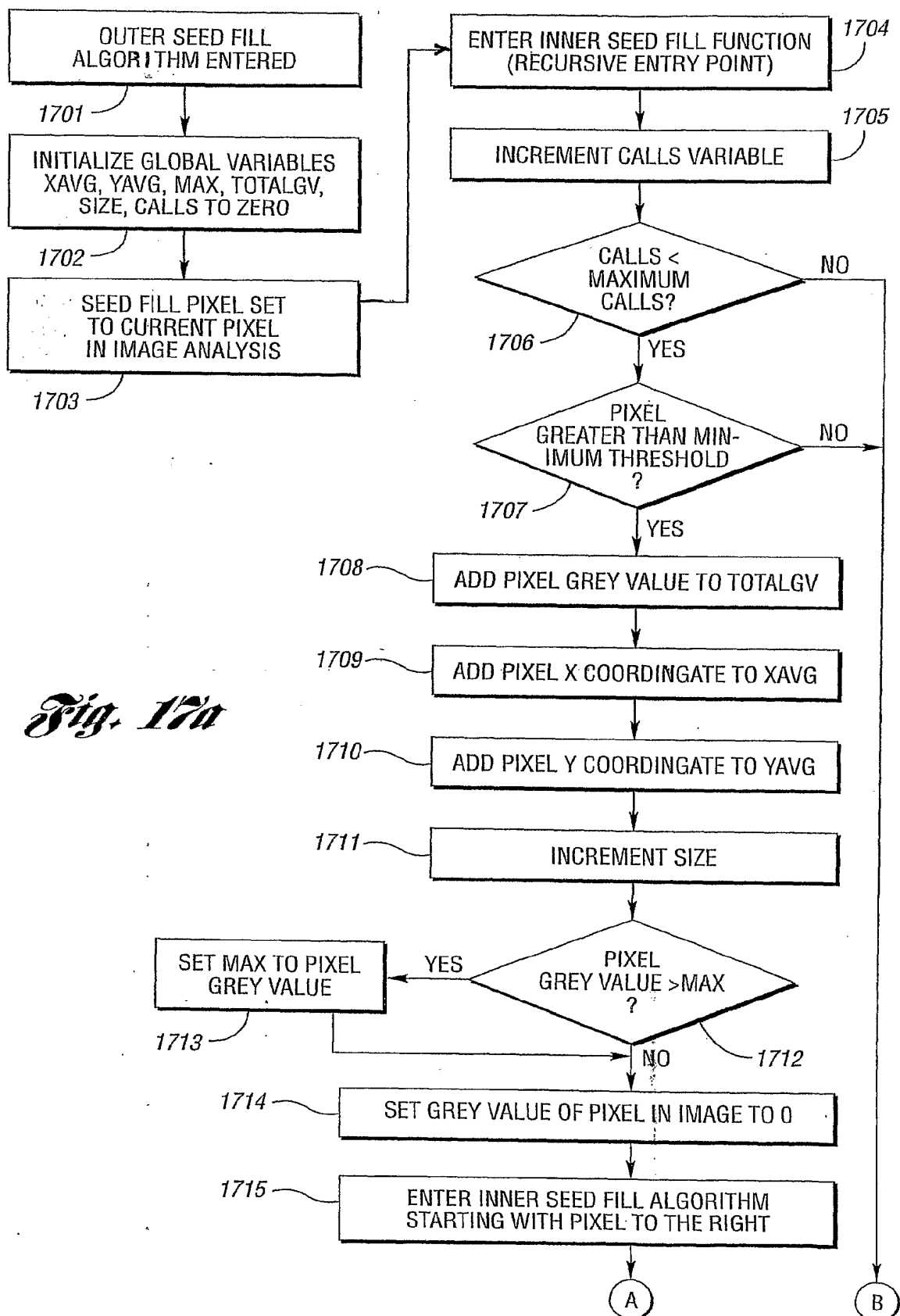
Fig. 12

*Fig. 13*

*Fig. 14*

*Fig. 15*





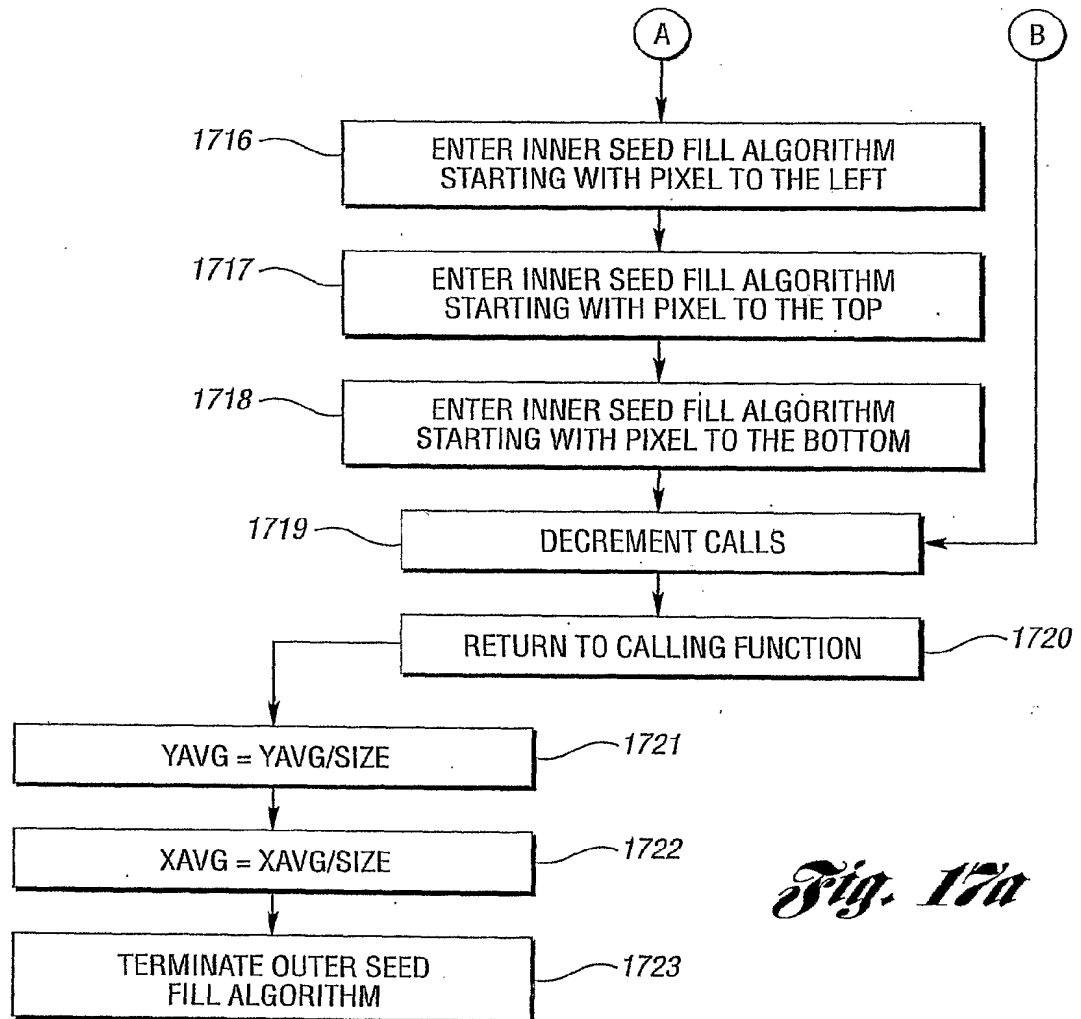
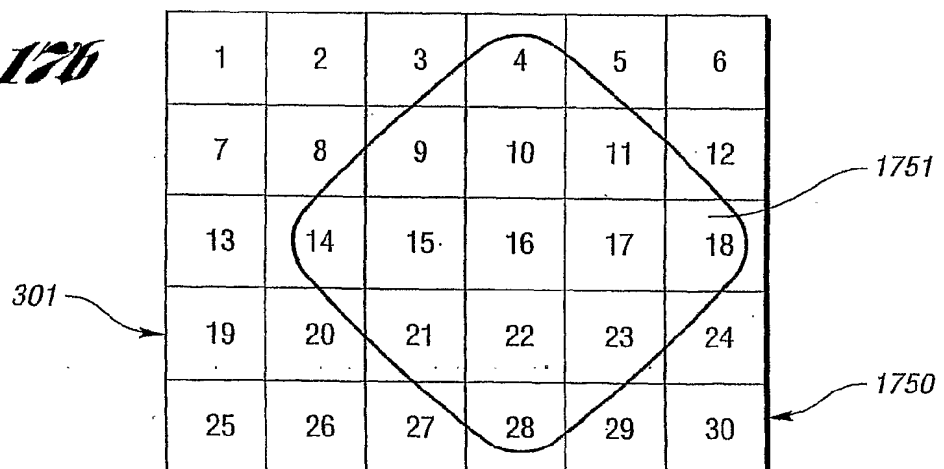
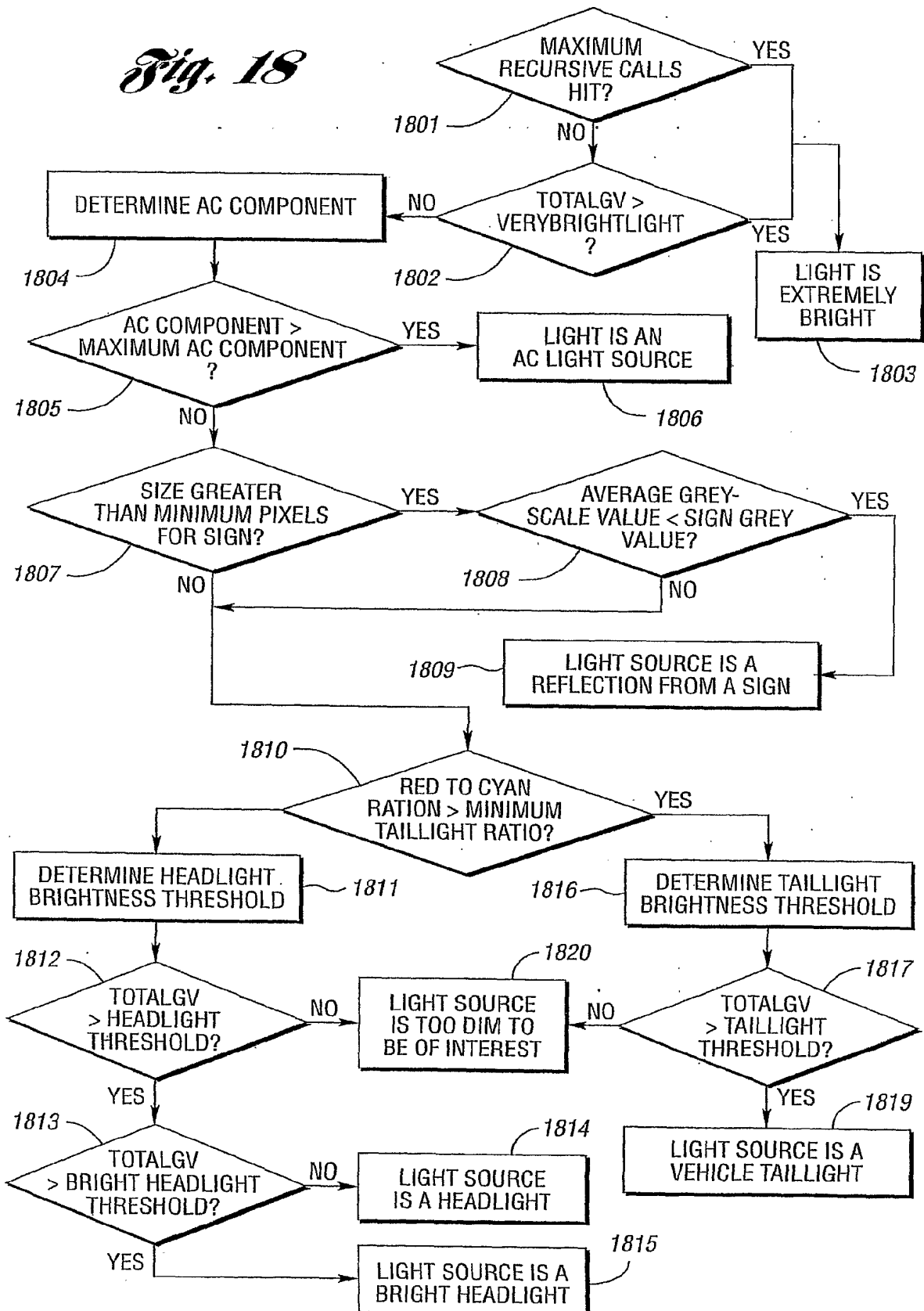
*Fig. 17a**Fig. 17b*

Fig. 18

16/40

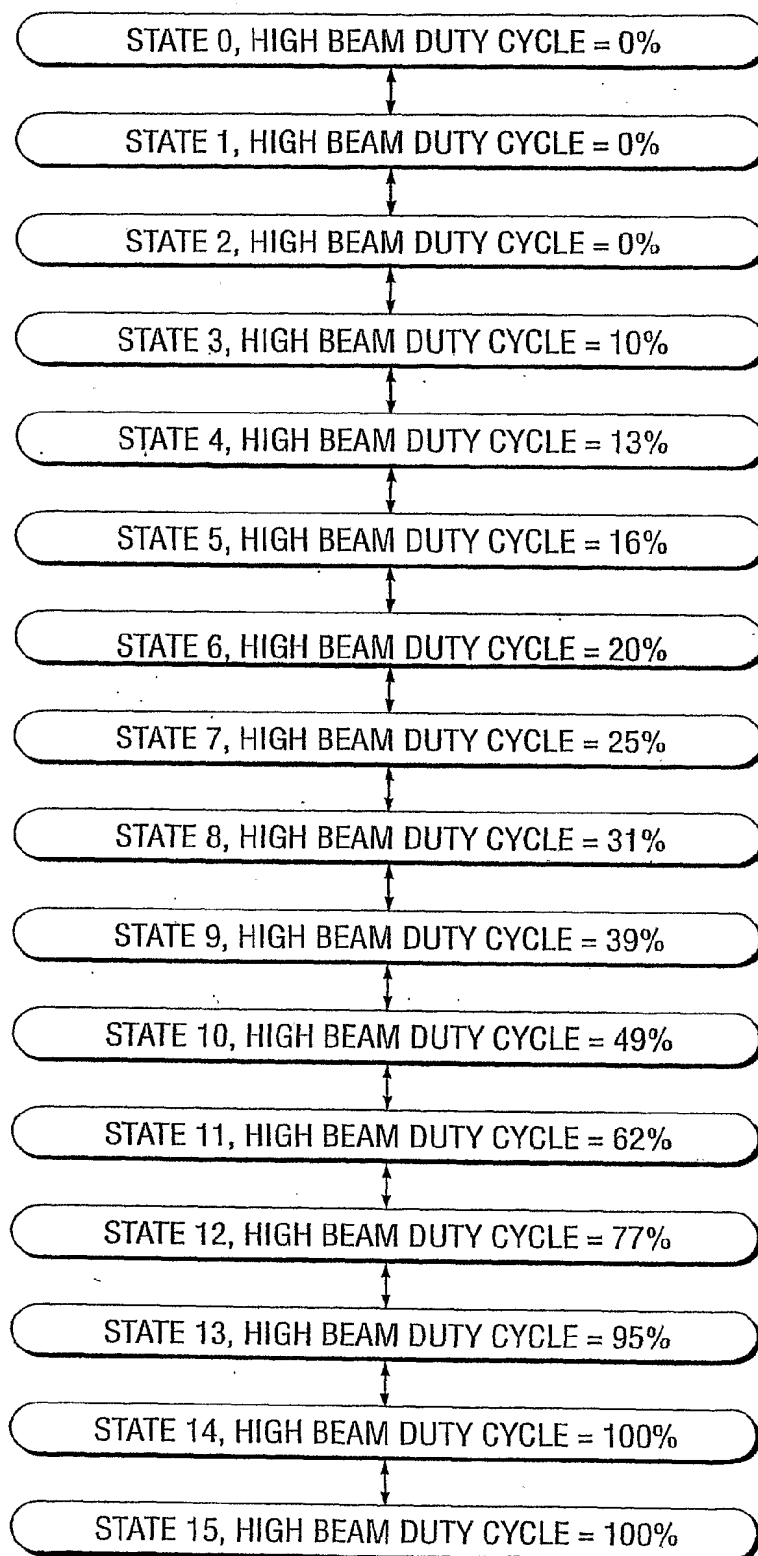
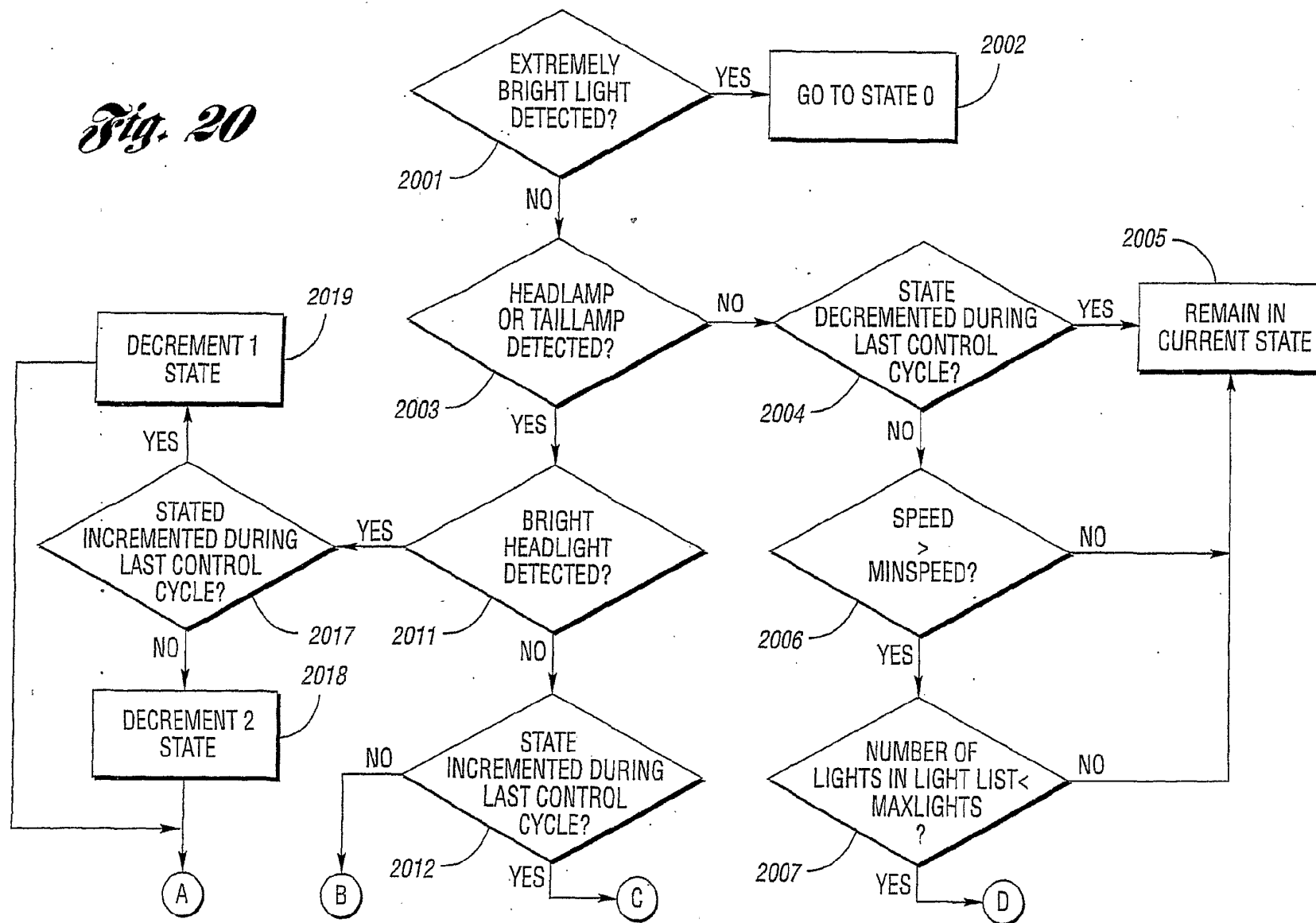
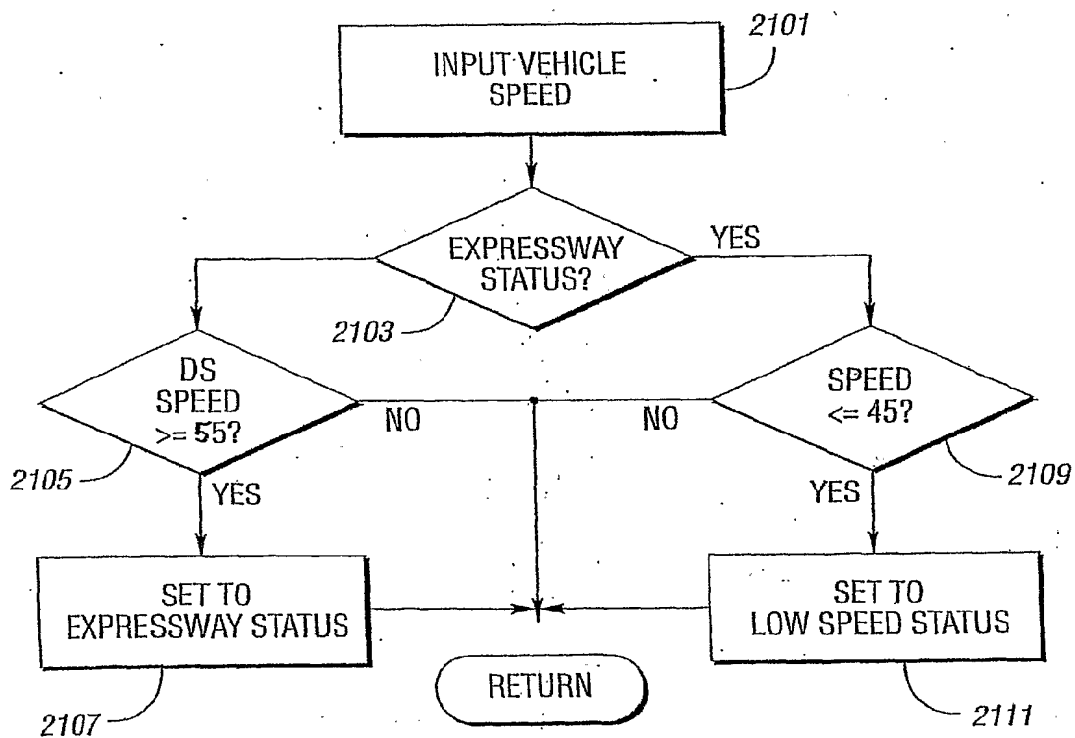
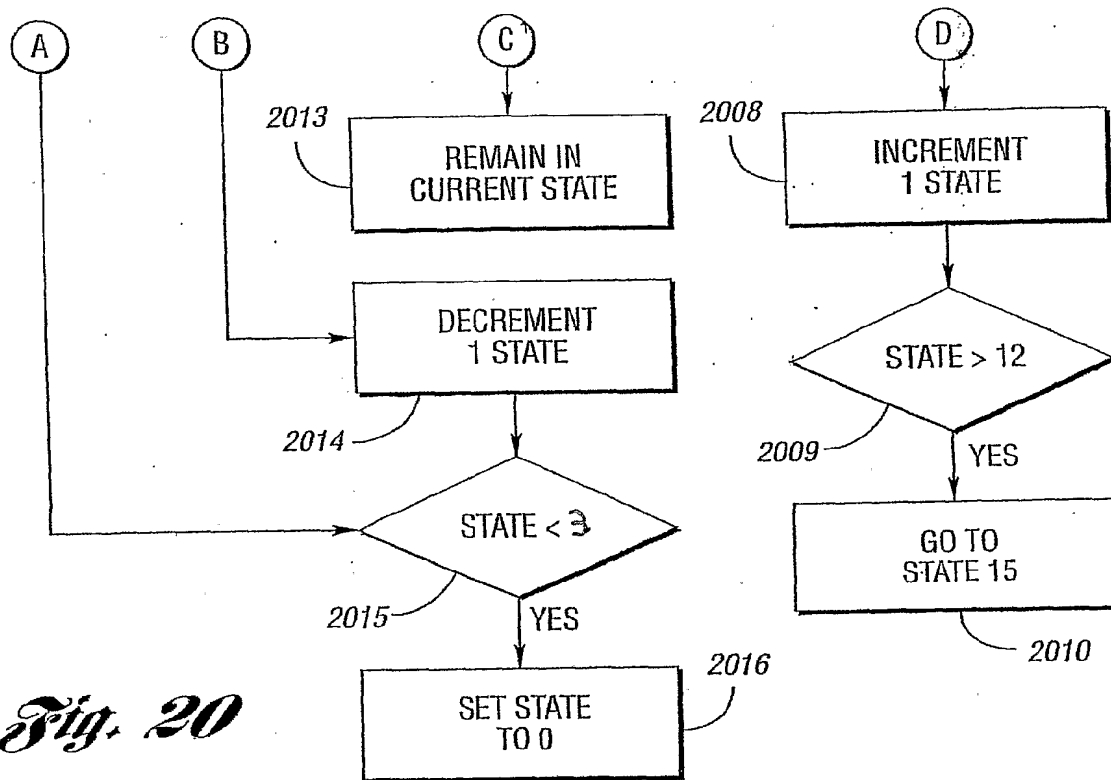
*Fig. 19*

Fig. 20



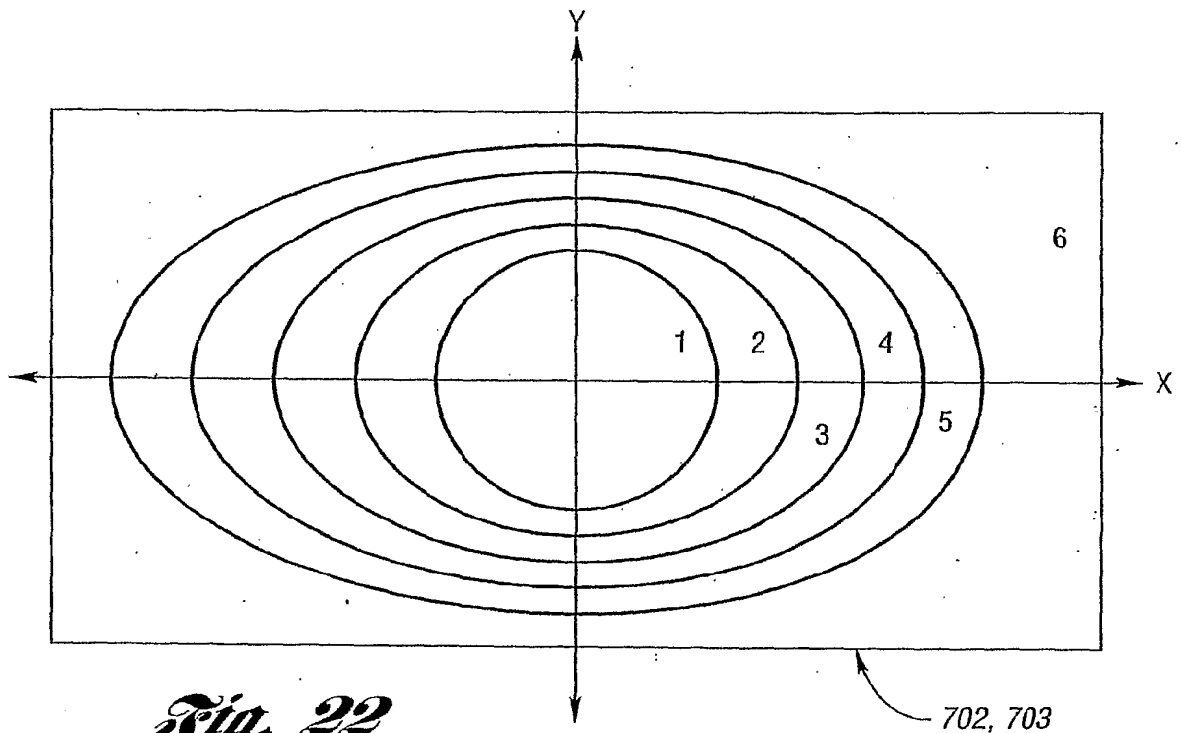


Fig. 22

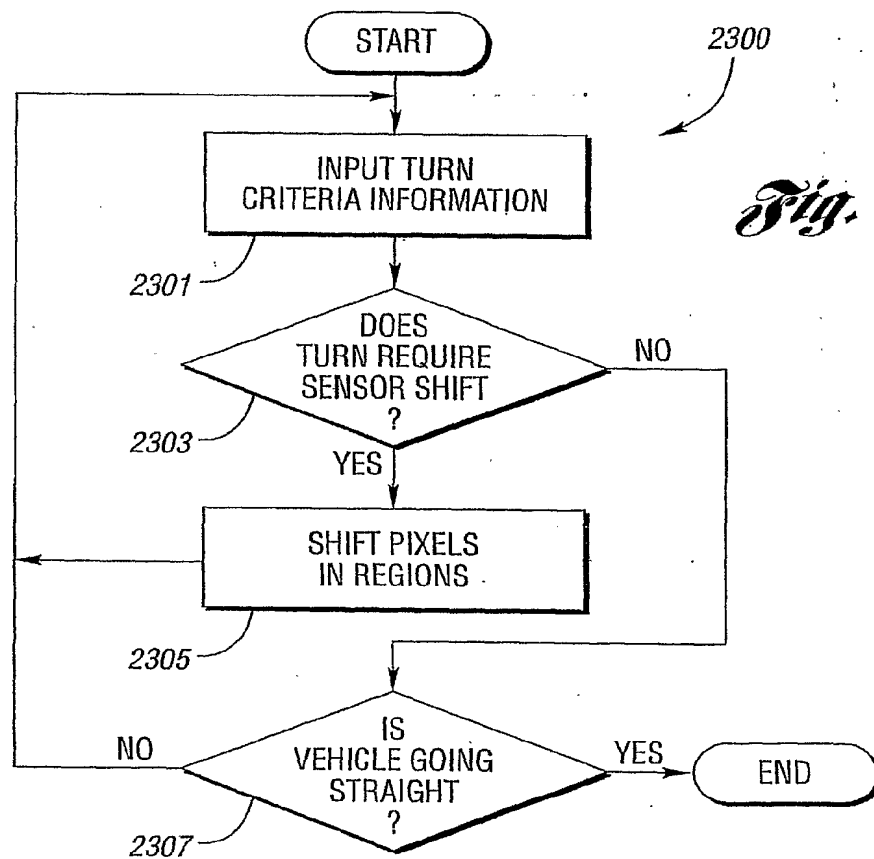


Fig. 23

Fig. 24

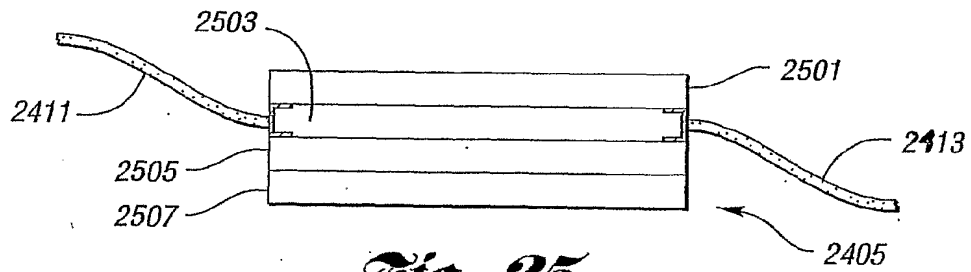
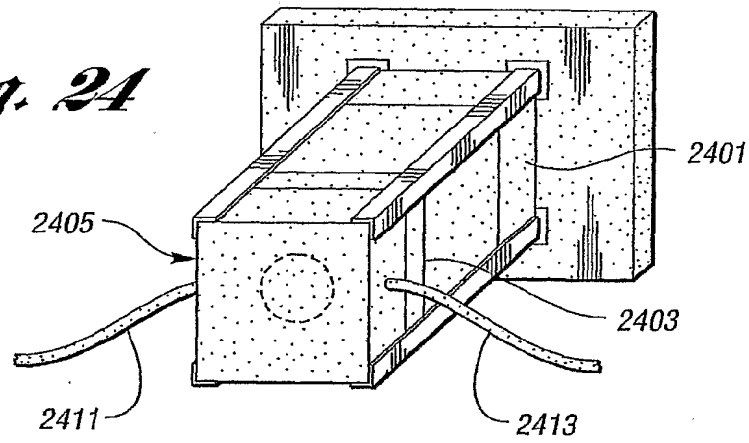
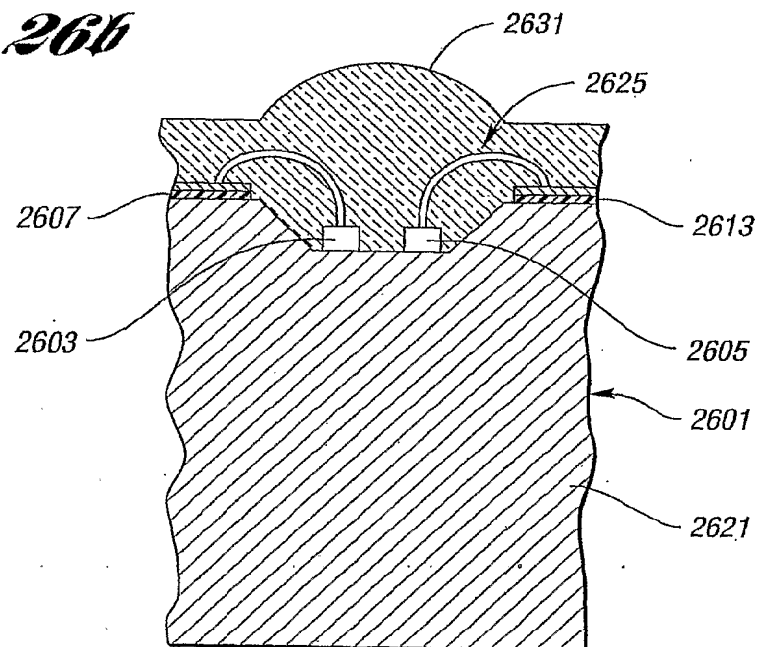


Fig. 25

Fig. 26b



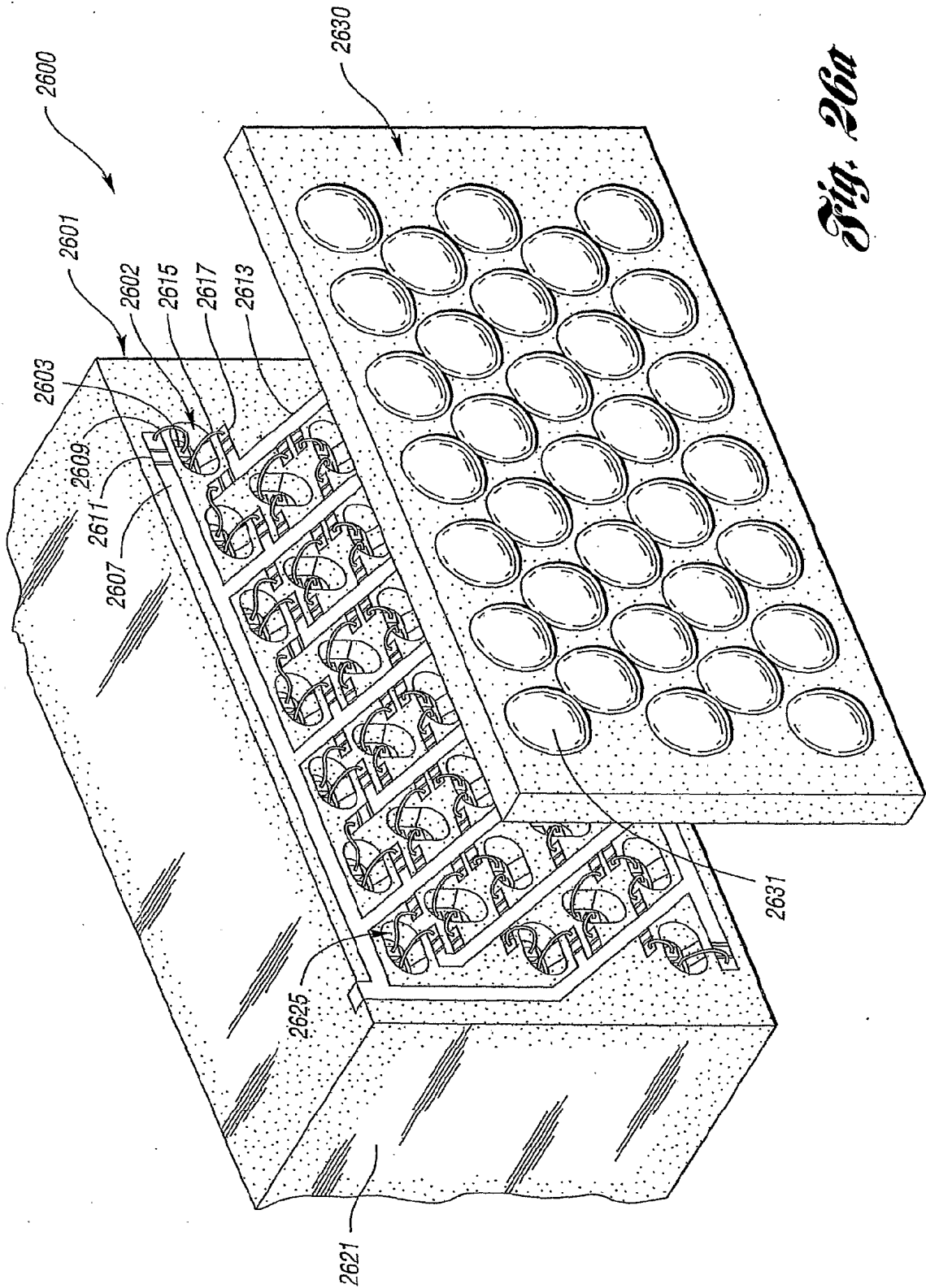


Fig. 26a

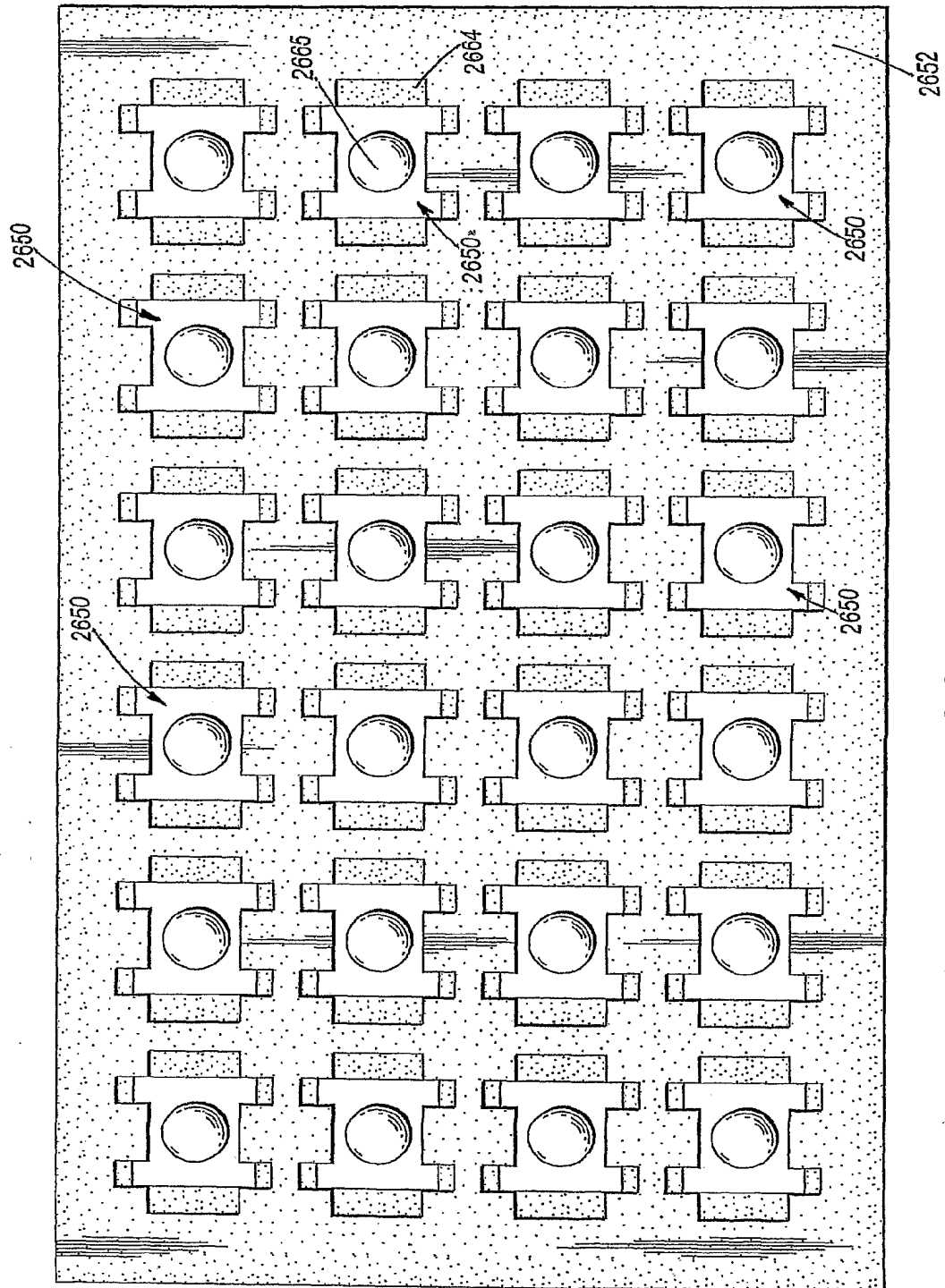
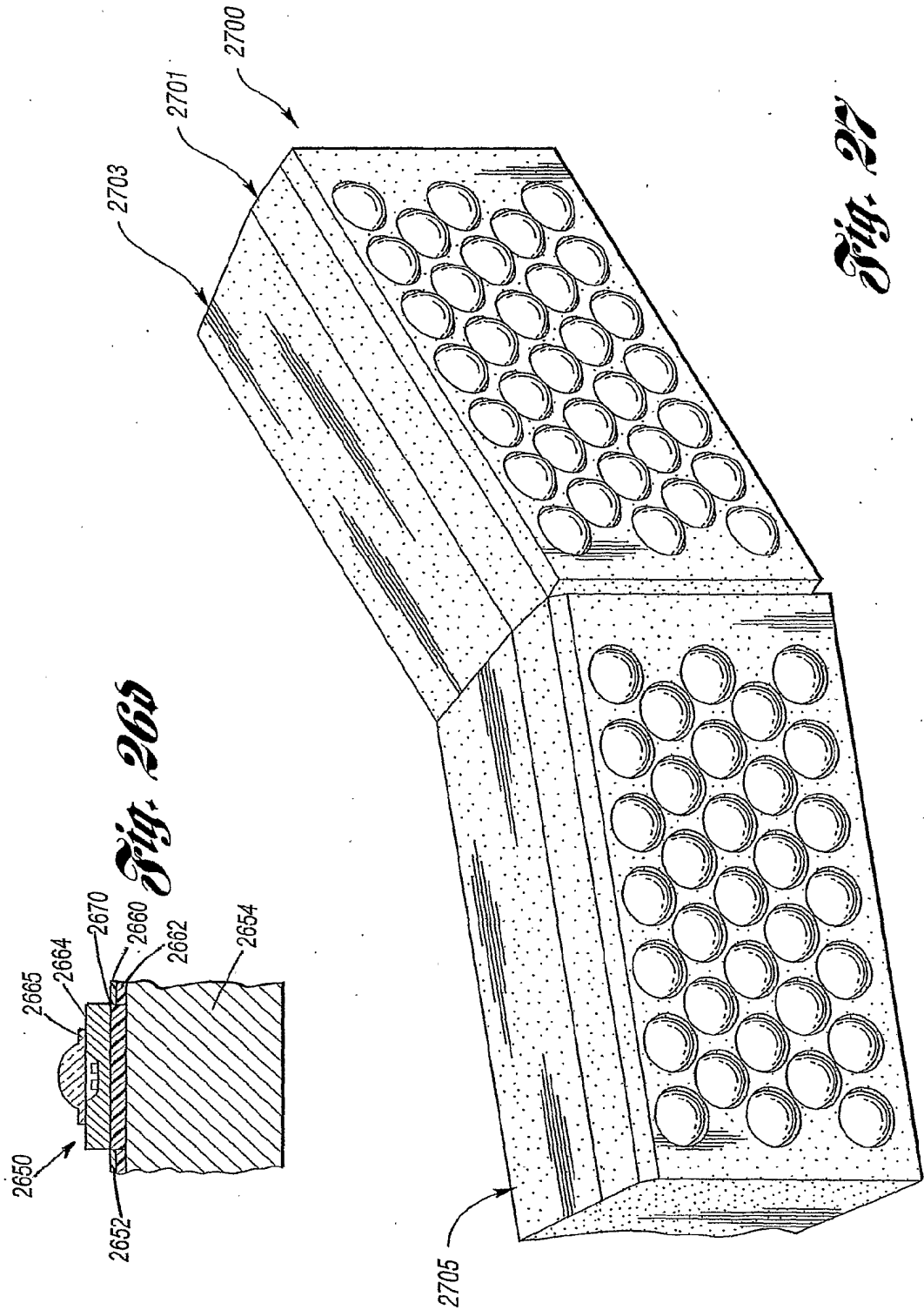


Fig. 26c



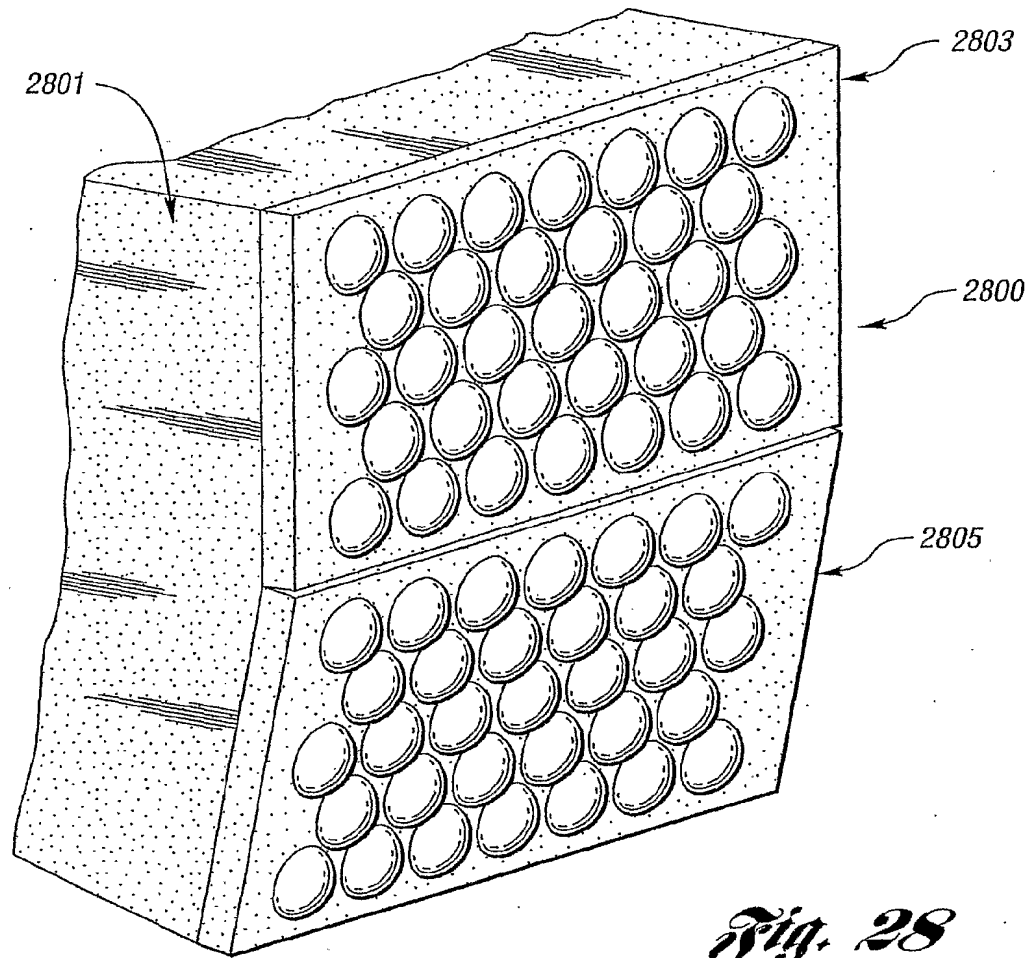


Fig. 28

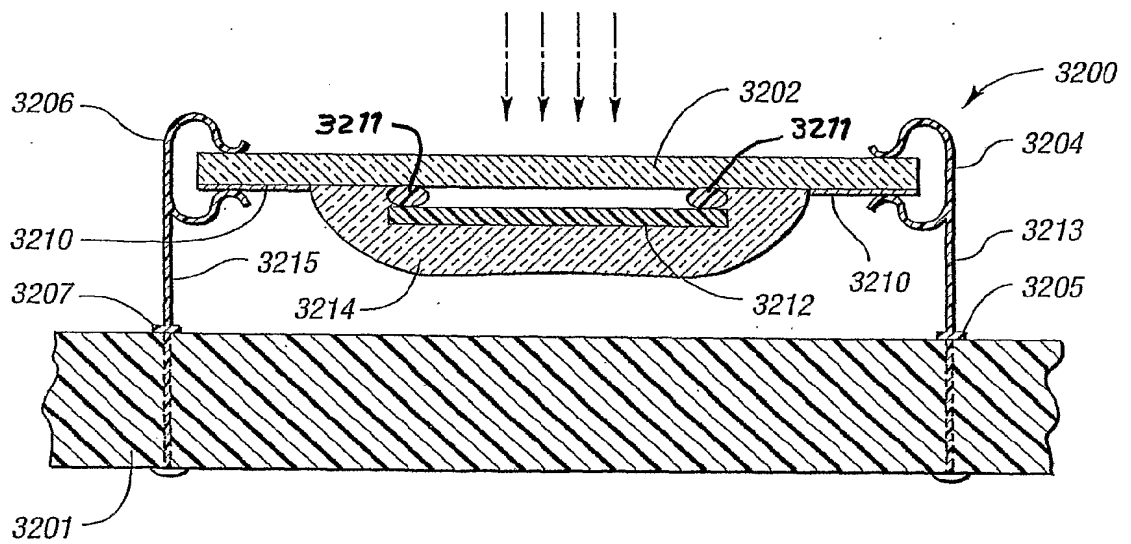


Fig. 32

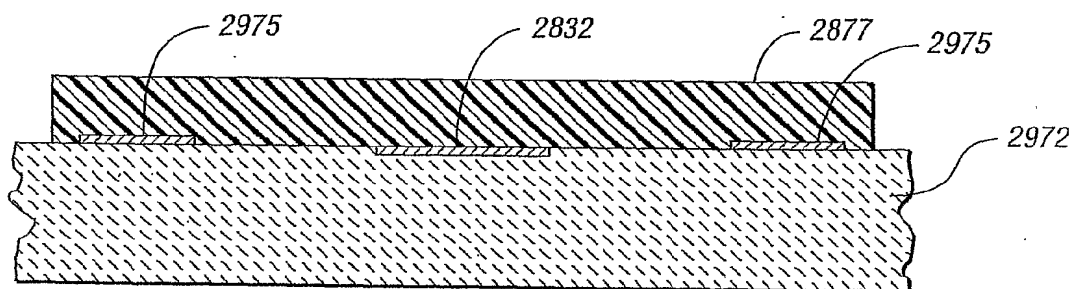


Fig. 29a

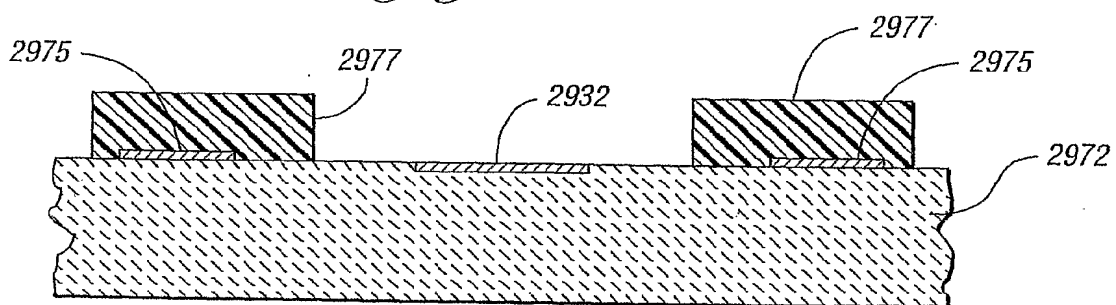


Fig. 29b

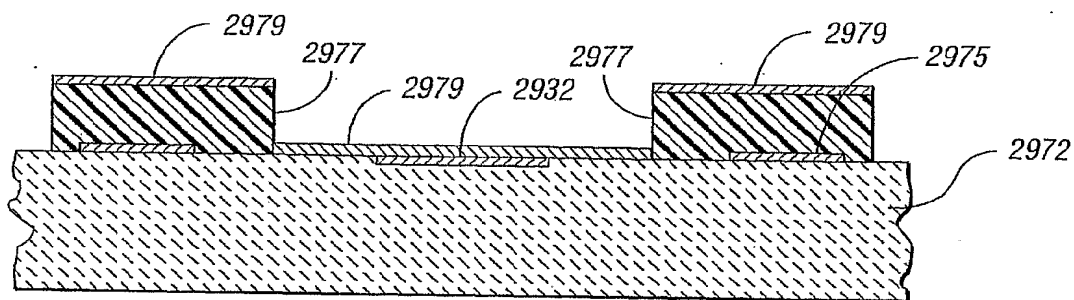


Fig. 29c

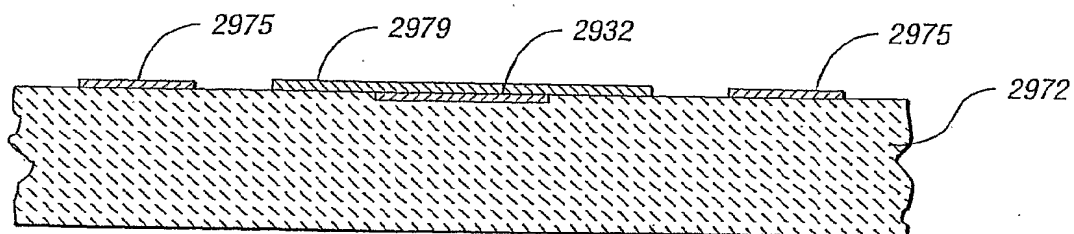
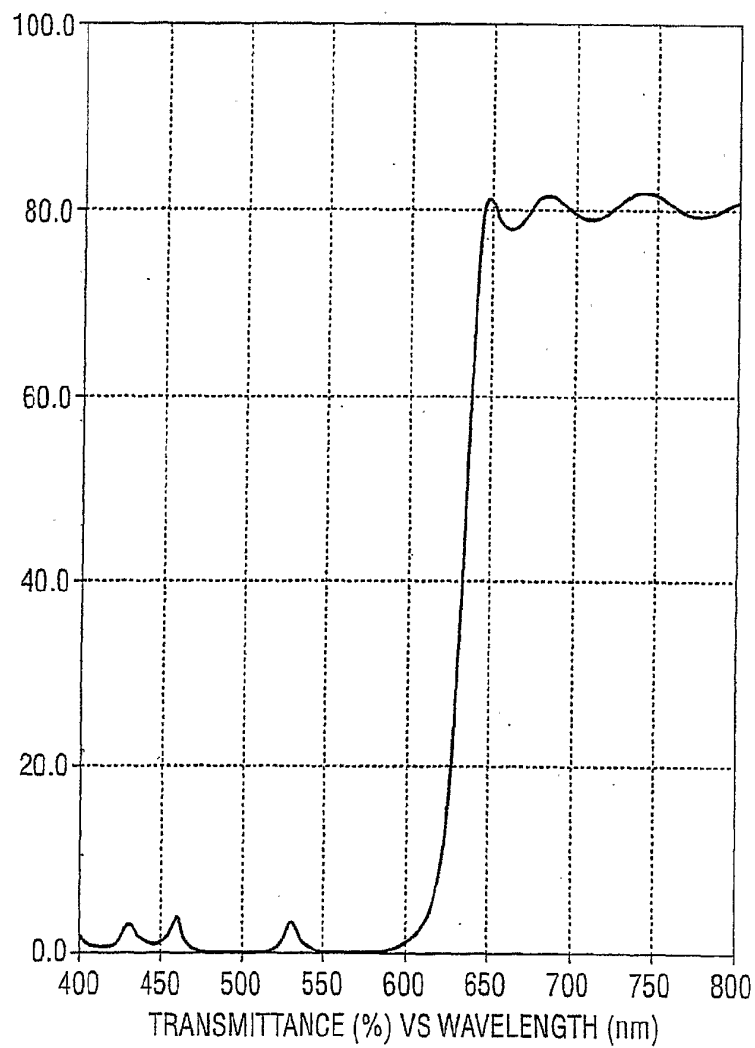
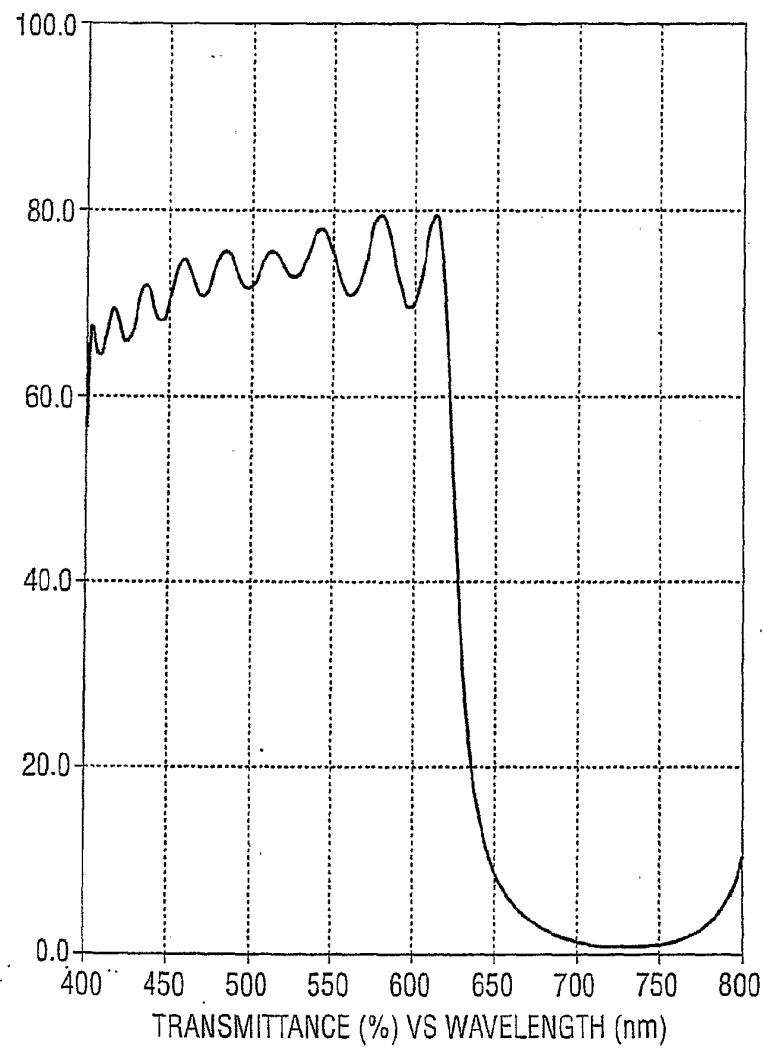


Fig. 29d

*Fig. 30**Fig. 31*

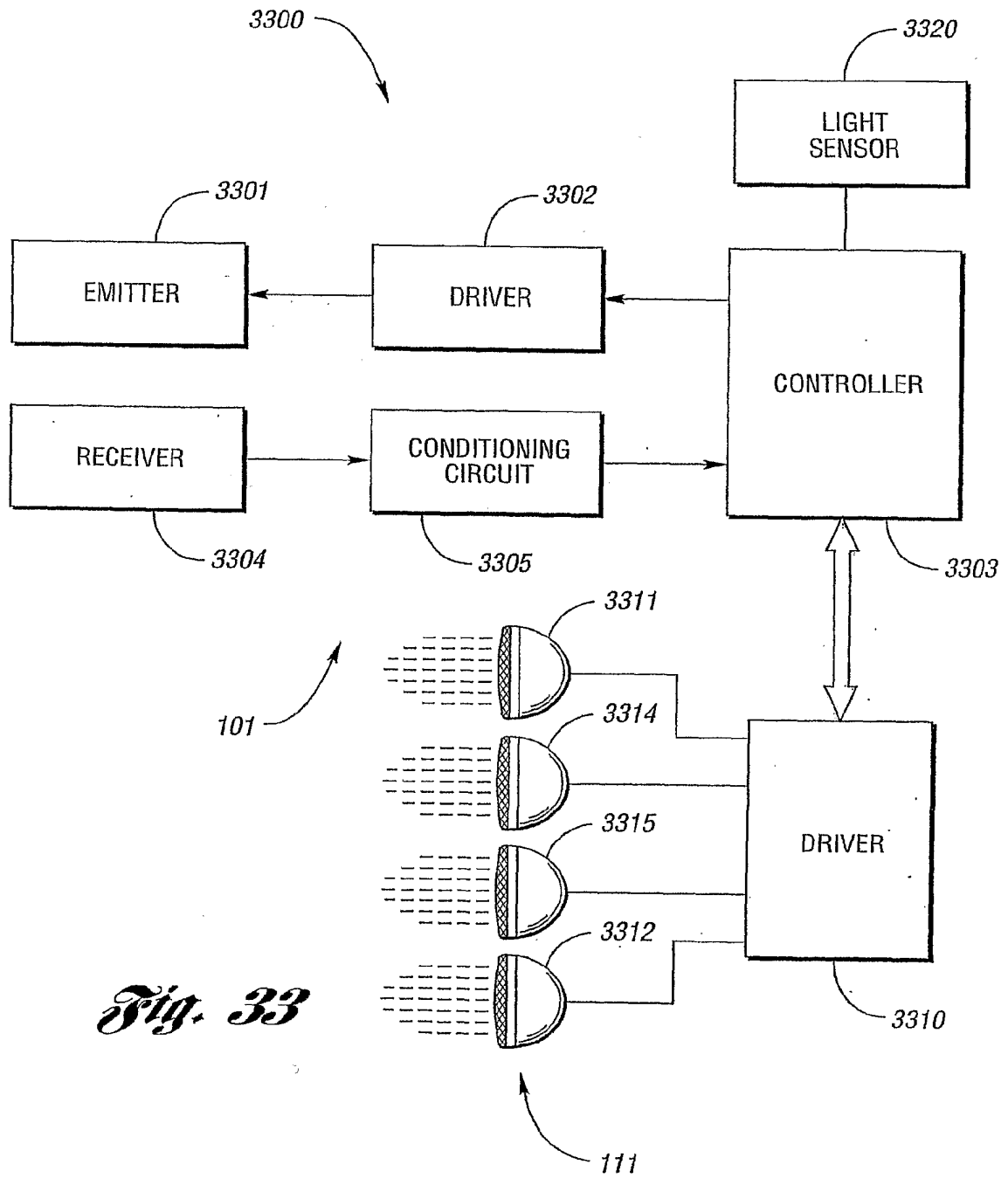


Fig. 33

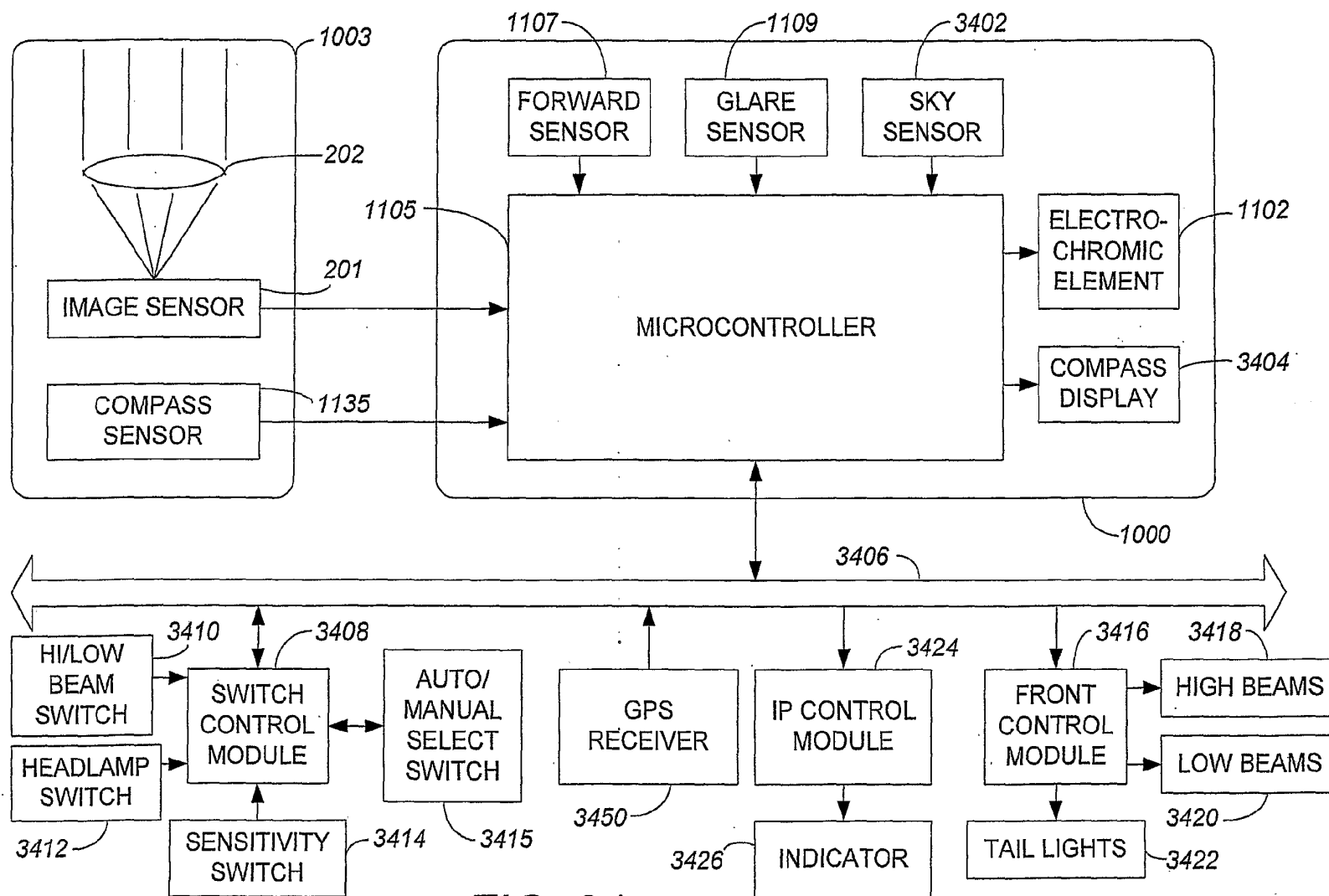


FIG. 34

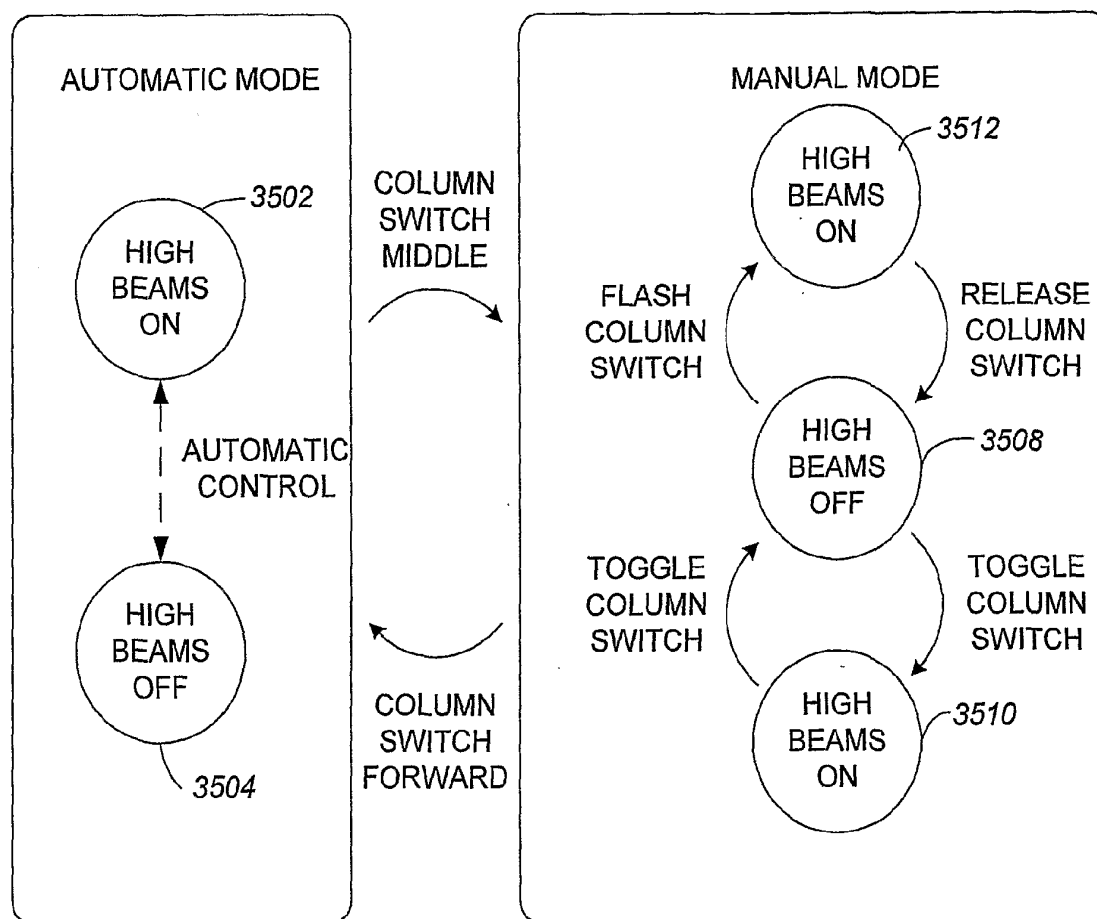


FIG. 35

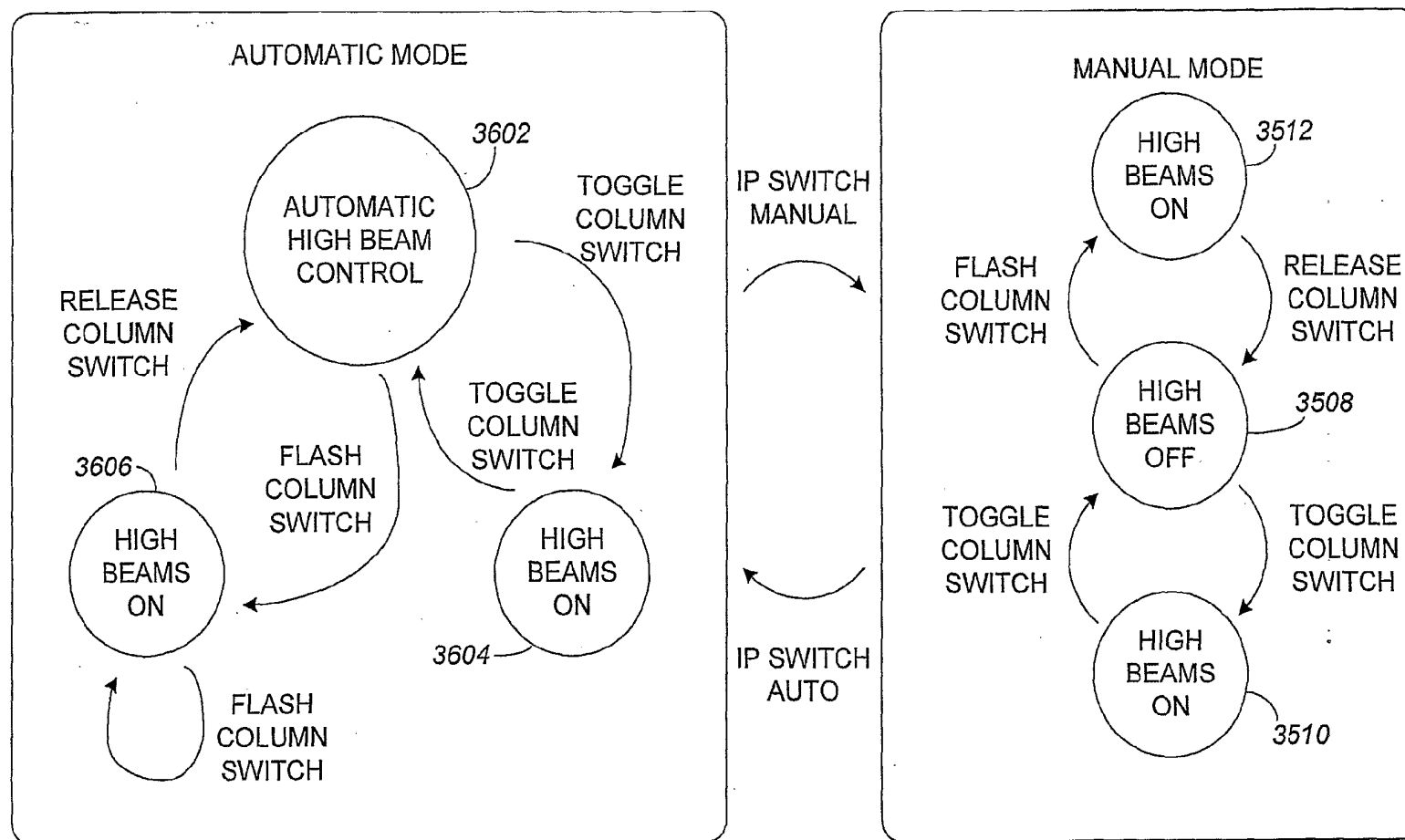


FIG. 36

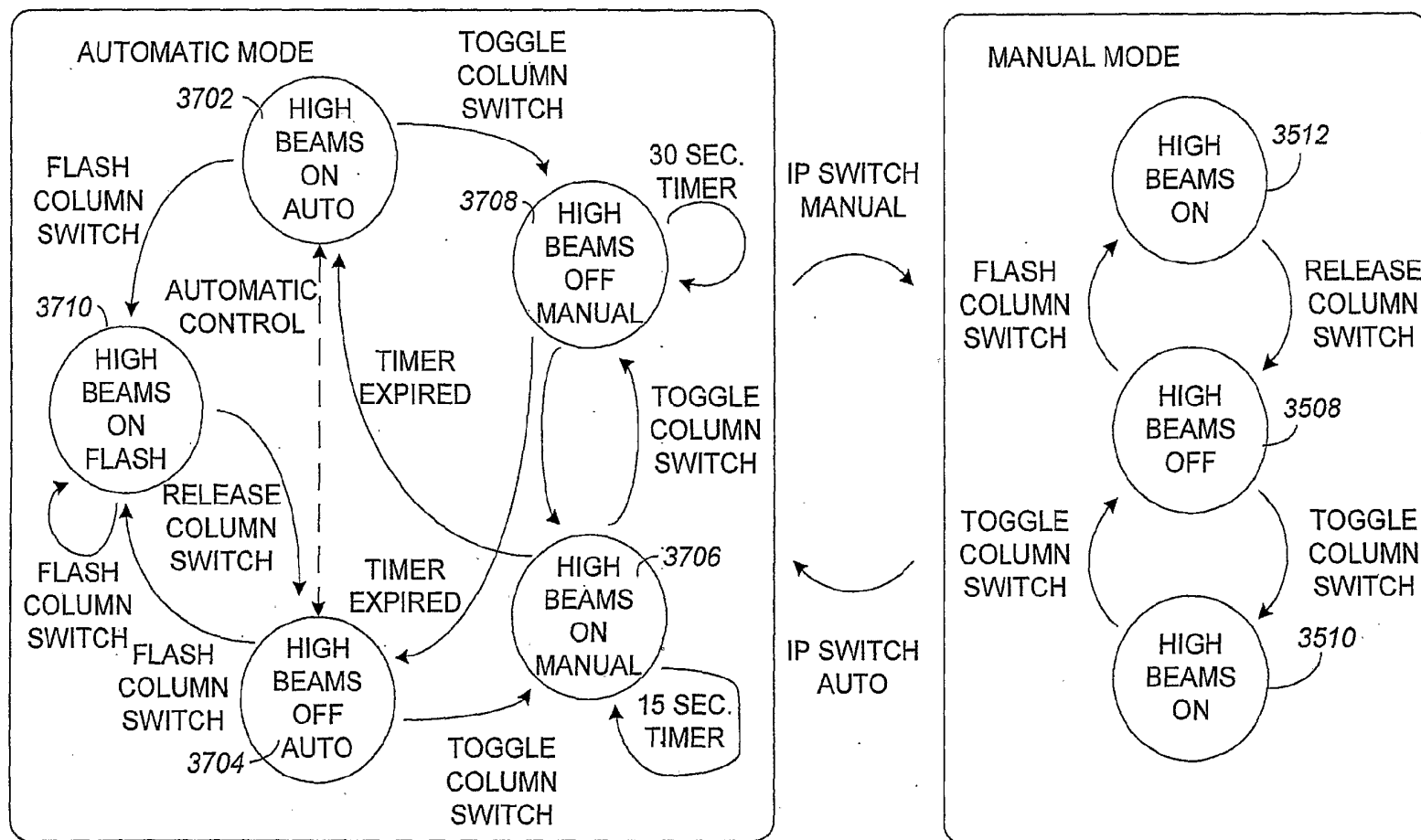


FIG. 37

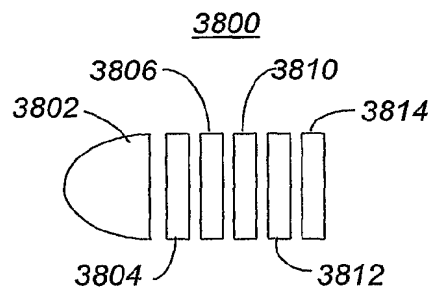


FIG. 38

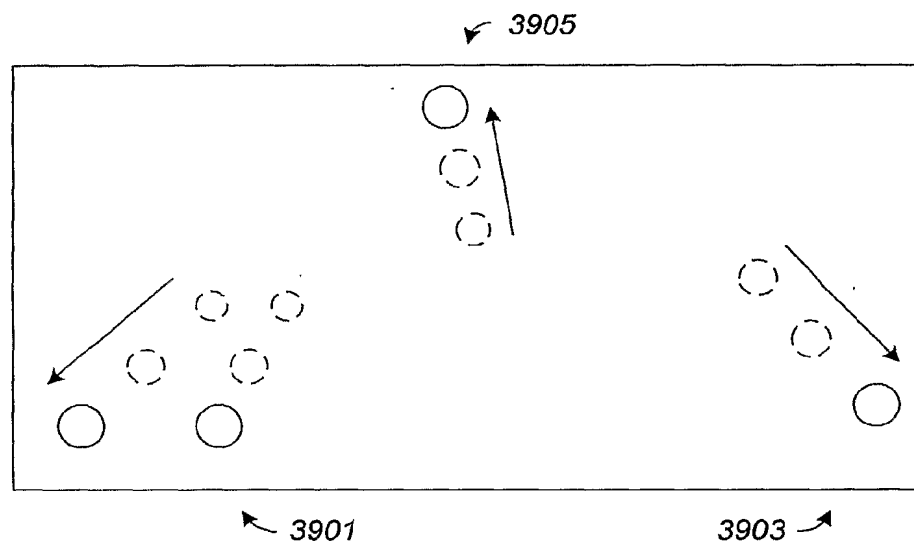


FIG. 39

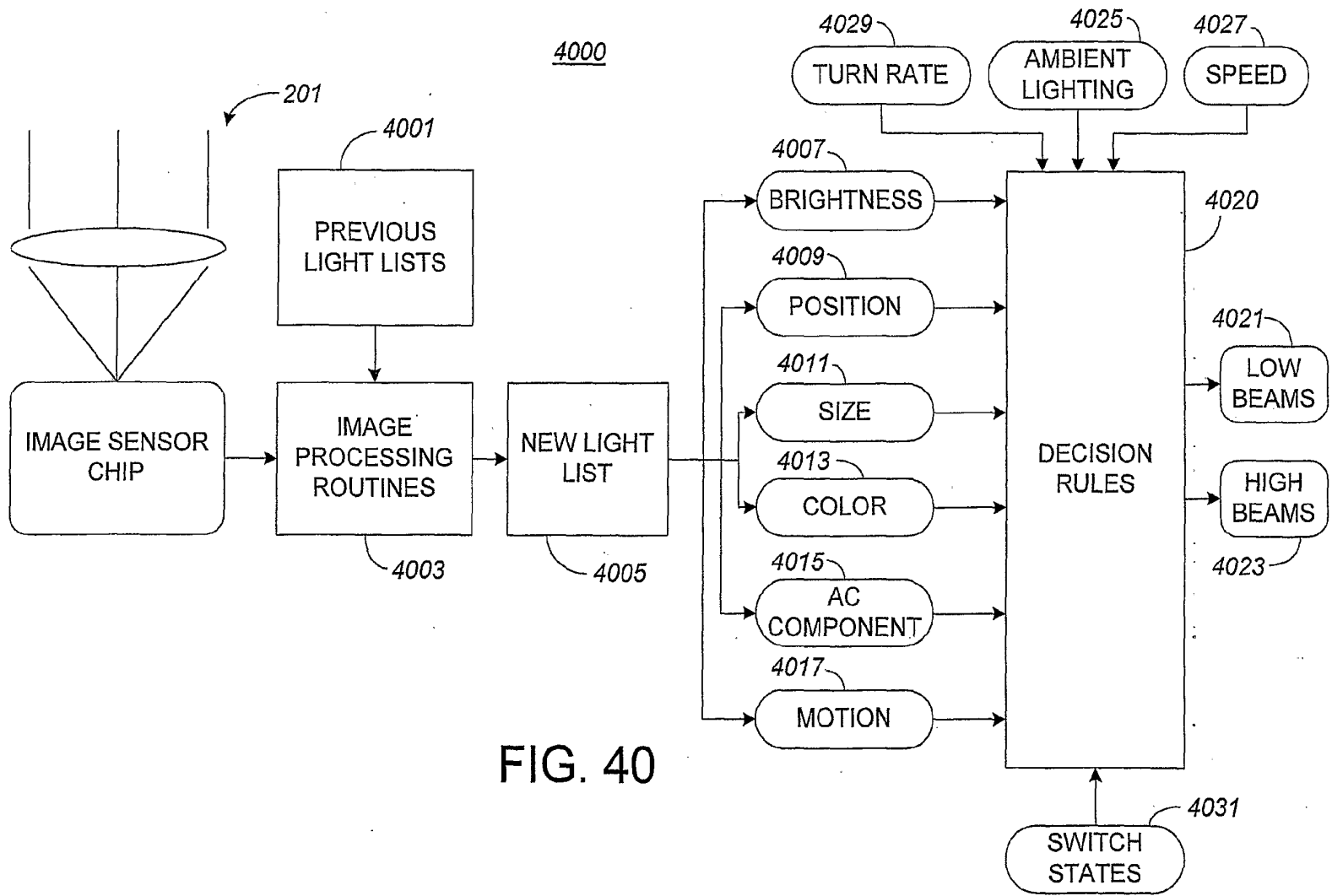
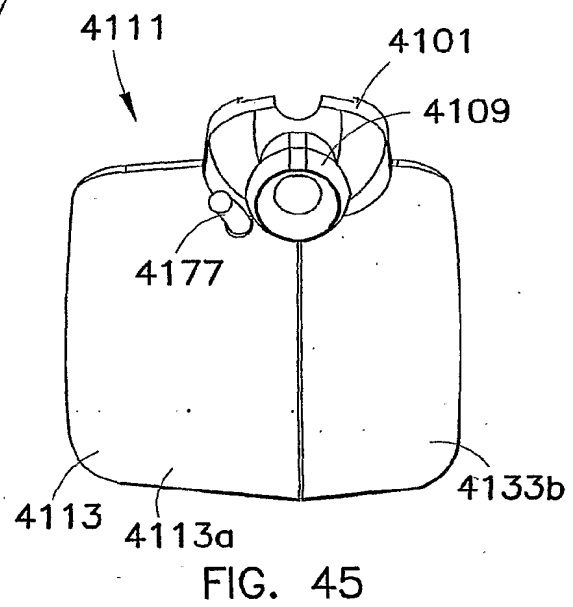
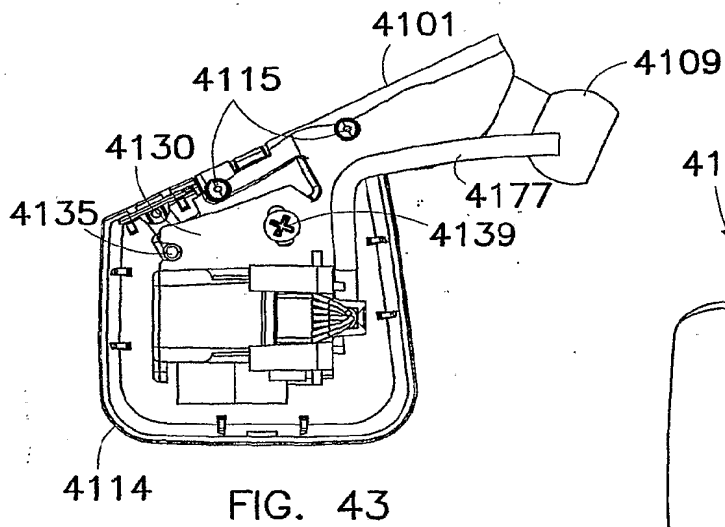
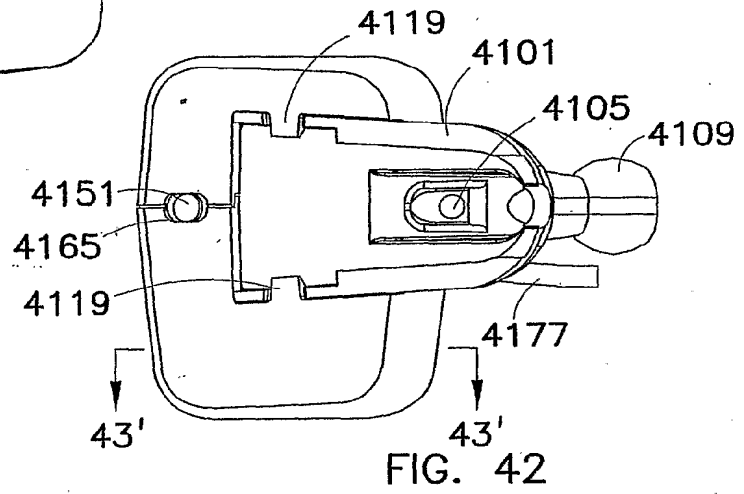
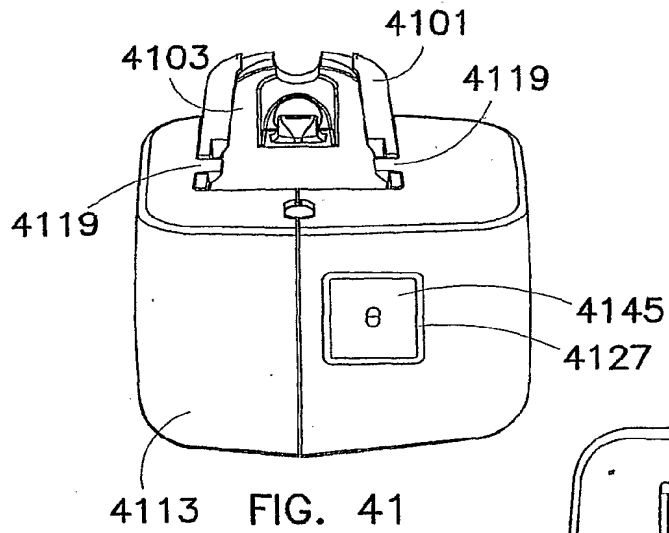


FIG. 40



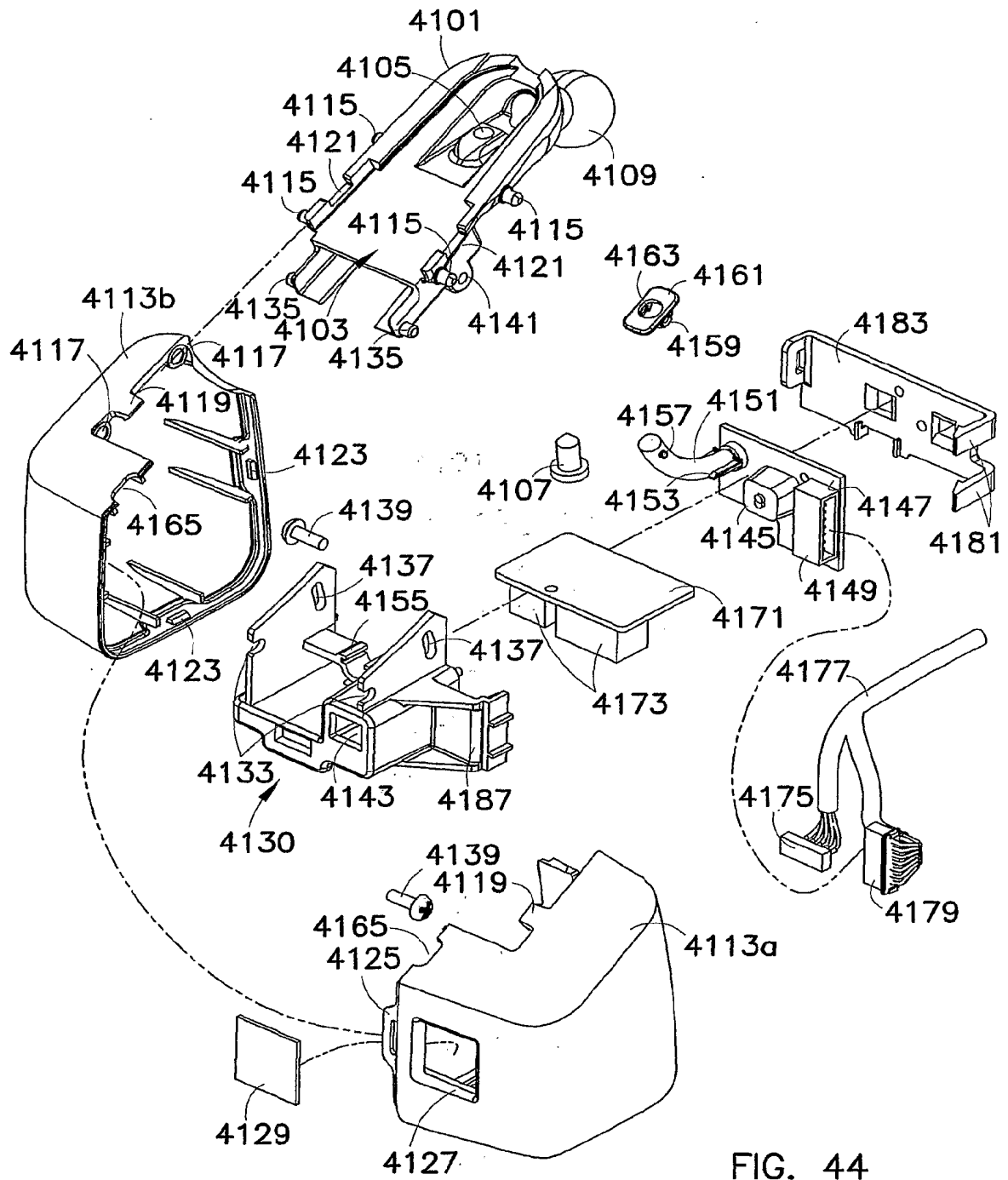
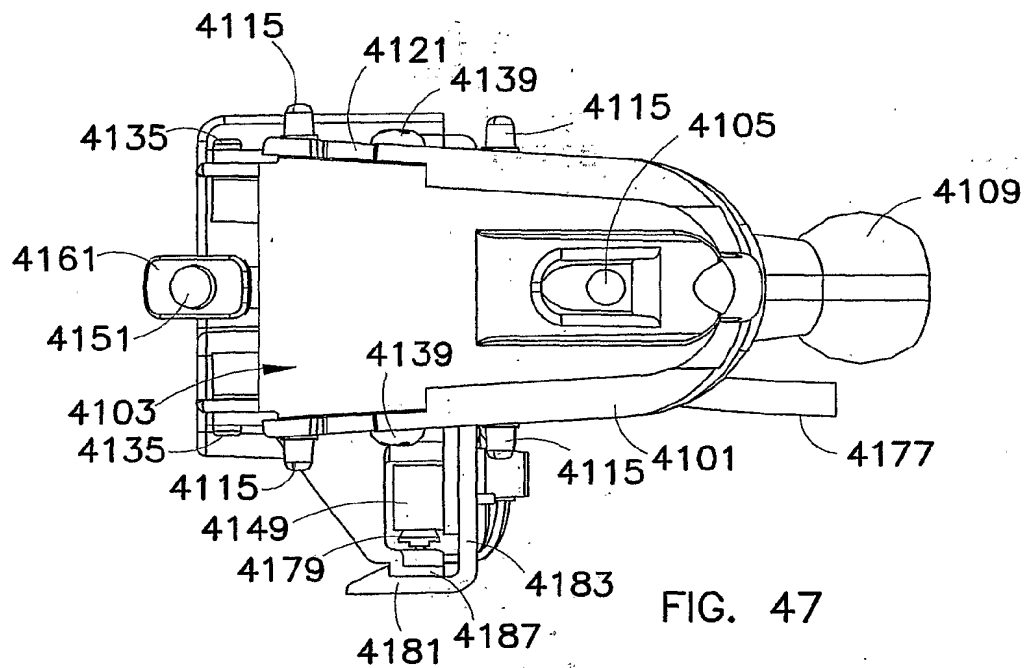
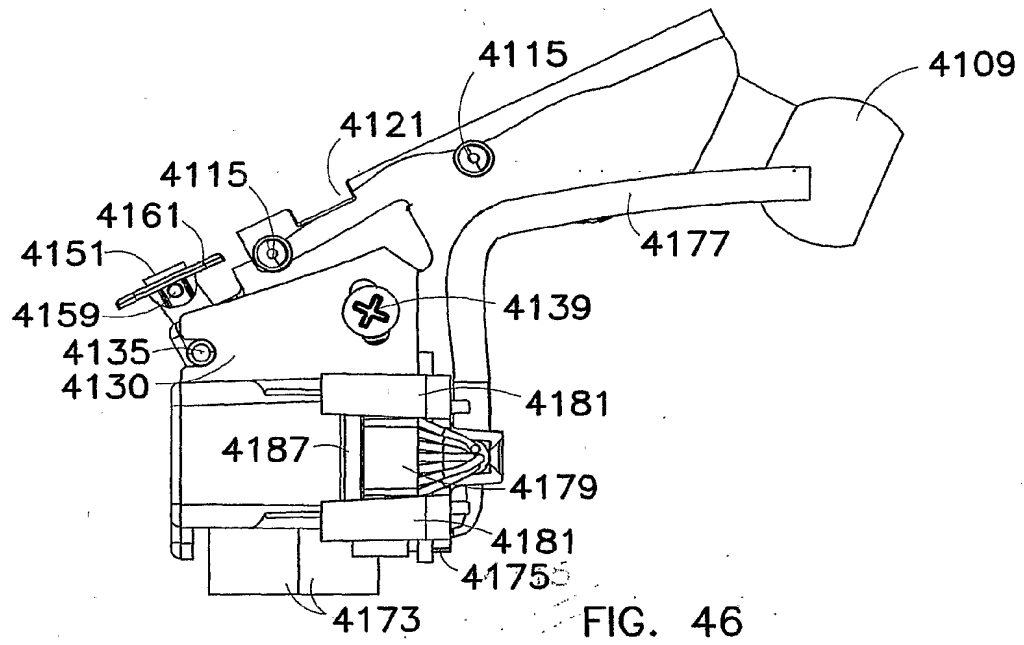


FIG. 44



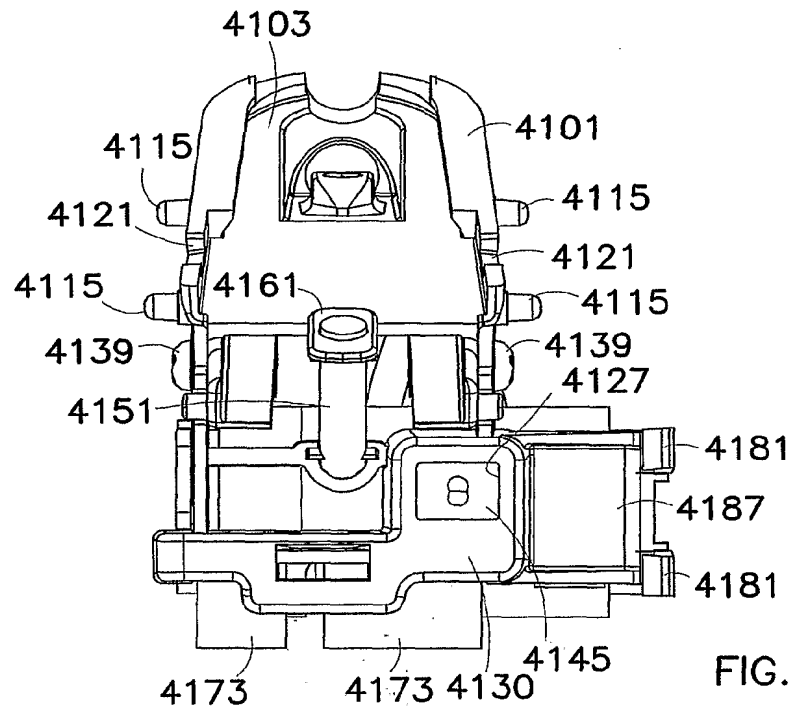


FIG. 48

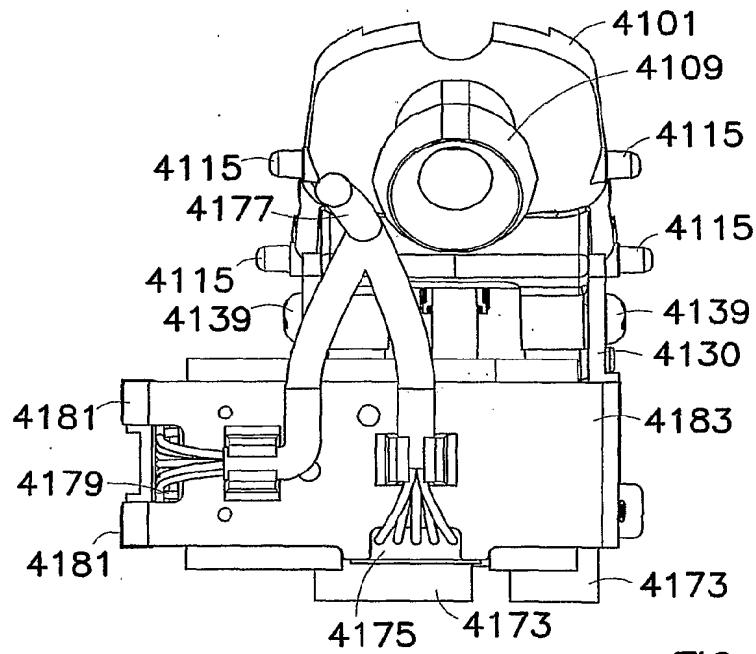


FIG. 49

FIG. 50A

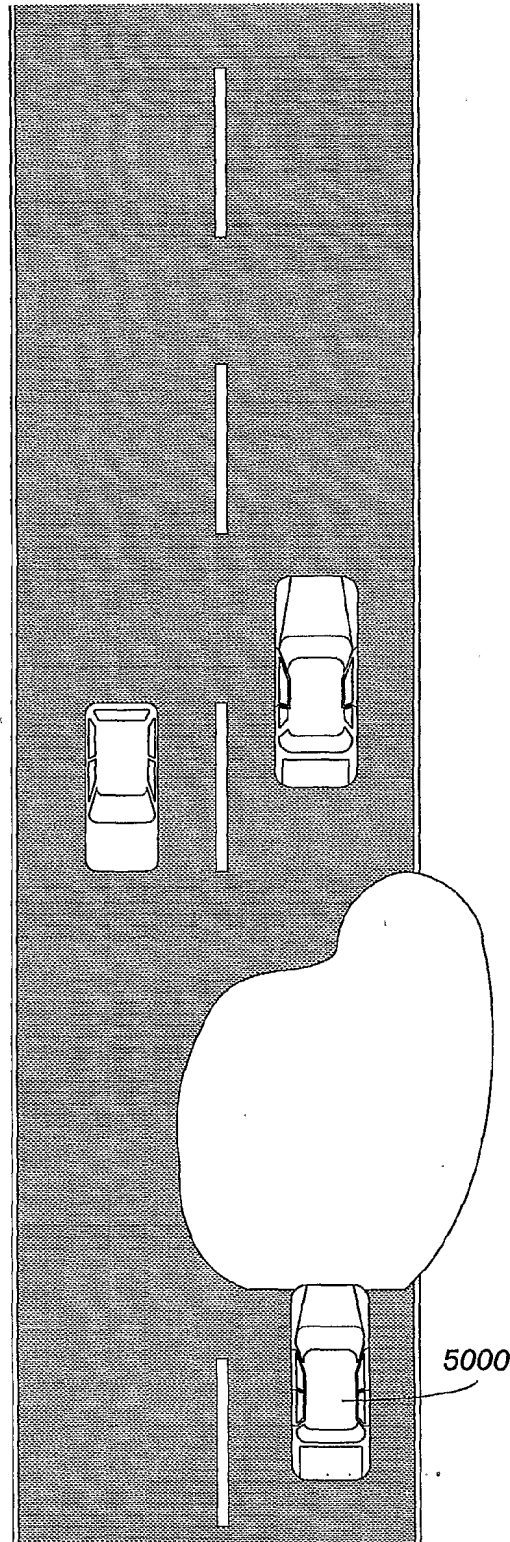


FIG. 50B

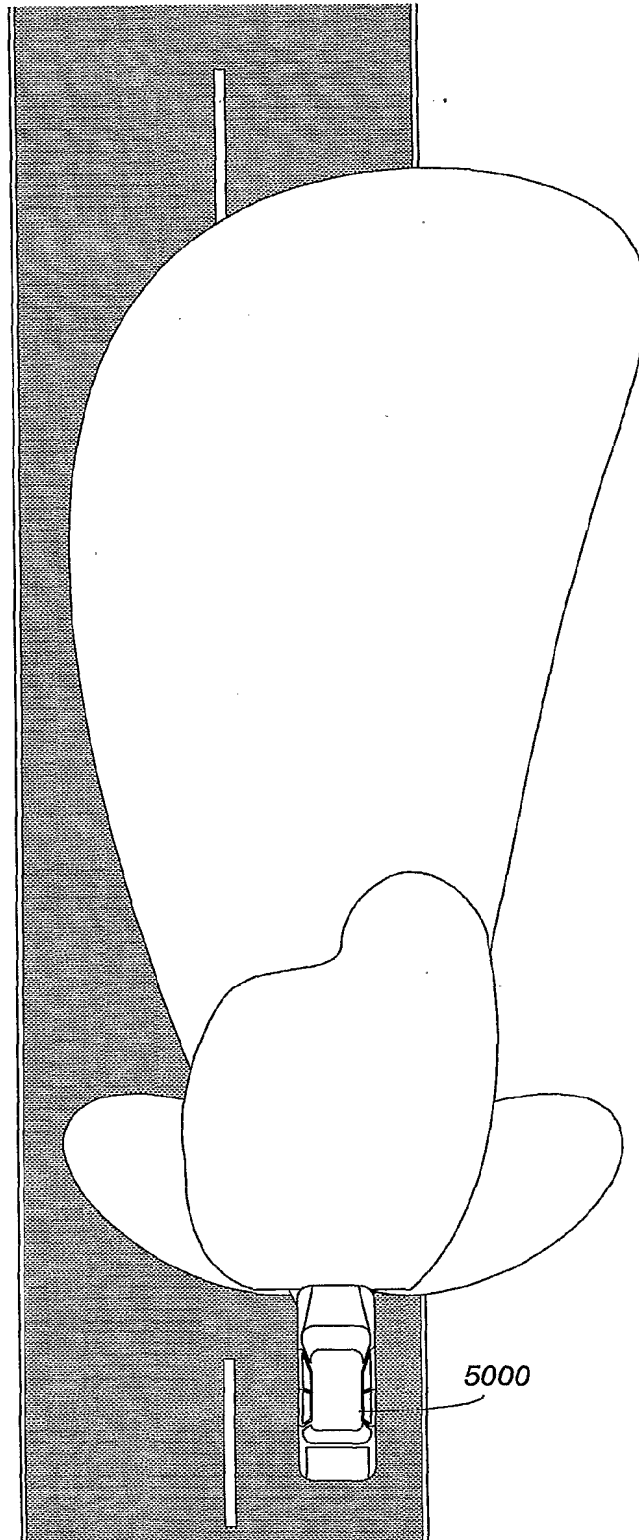
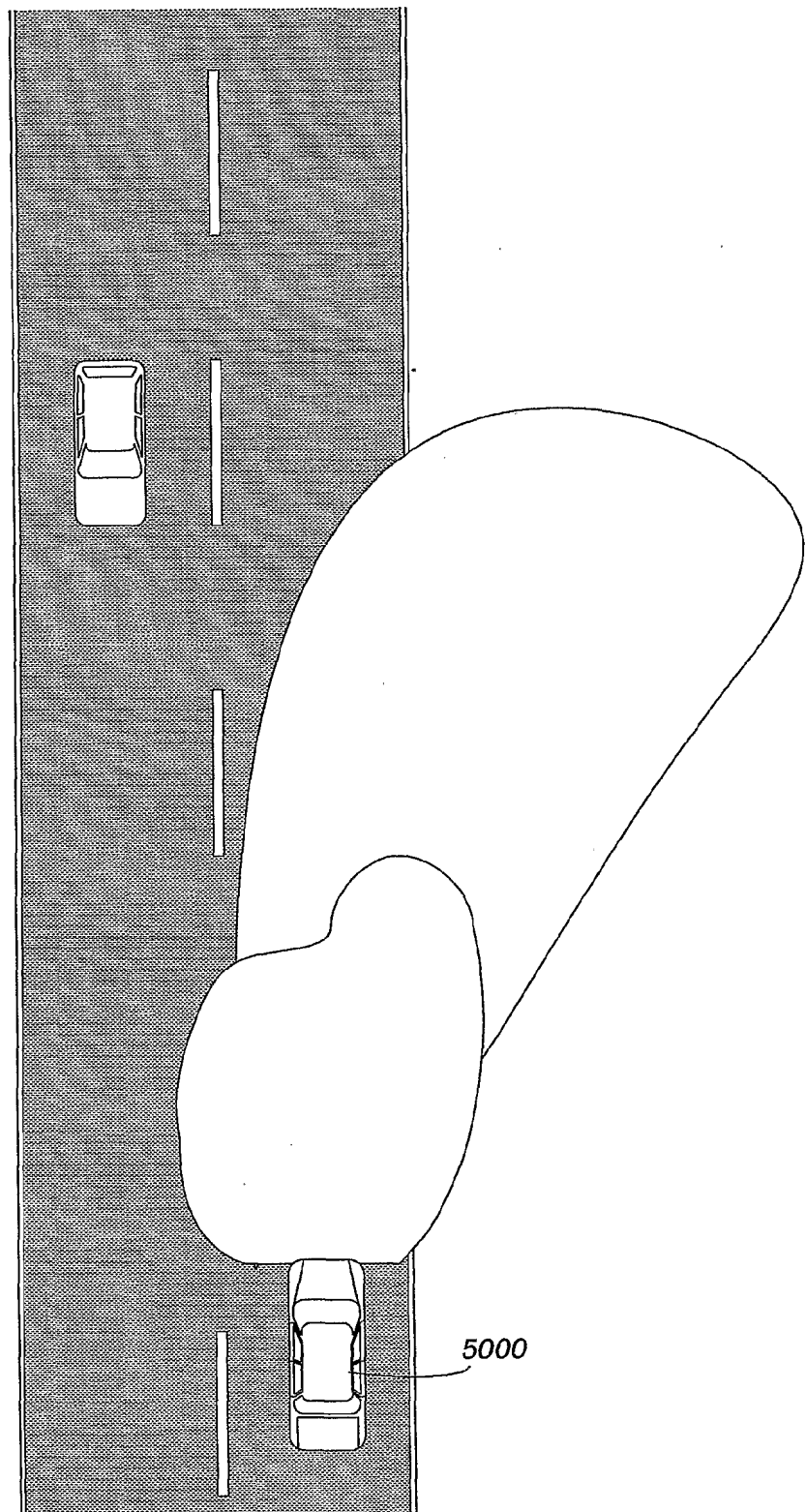


FIG. 50C



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

YECHEZKAL EVAN SPERO

Serial No.: 17/152,399

Filed: January 19, 2021

For: ADAPTIVE CONTROLLED HEADLIGHT SYSTEM

Attorney Docket No.: TRCH0103PUSP3

Group Art Unit: 2644

Examiner: LE, TUNG X

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97(b)(1)**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and §§ 1.97-1.98, the references listed and identified on the attached Form PTO/SB/08a are being submitted herewith for consideration by the Examiner. This Statement is being filed in accordance with 37 C.F.R. § 1.97(b)(1).

While this Statement is being filed in compliance with the duty of disclosure, citation of the listed references is not to be construed as an admission that any of the references are "material" as defined under 37 C.F.R. § 1.56(b).

In accordance with 37 C.F.R. § 1.98(d), copies of the listed references are not being provided since the references were previously cited by or submitted to the Patent and Trademark Office in prior application Serial No. 15/961,861, filed April 24, 2018 patented as 10,894,503 B2, of which the present application is a continuation and in prior application Serial No. 13/357,549, filed January 24, 2012 patented as 9,955,551 B2, of which the present application is a continuation.

Respectfully submitted,

Yechezkal Evan Spero

By: /Bernard P. Tomsa/

Bernard P. Tomsa

Reg. No. 60,121

Attorney/Agent for Applicant

Date: July 8, 2021

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Southfield, MI 48075-1238

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Fax: 248-358-3351

Electronic Patent Application Fee Transmittal				
Application Number:		17152399		
Filing Date:		19-Jan-2021		
Title of Invention:		ADAPTIVE HEADLIGHT SYSTEM		
First Named Inventor/Applicant Name:		Yechezkal Evan Spero		
Filer:		Bernard Patrick Tomsa/Fiona Archer		
Attorney Docket Number:		TRCH0103PUSP3		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	260	260
Total in USD (\$)				260

Electronic Acknowledgement Receipt

EFS ID:	43195146
Application Number:	17152399
International Application Number:	
Confirmation Number:	6274
Title of Invention:	ADAPTIVE HEADLIGHT SYSTEM
First Named Inventor/Applicant Name:	Yechezkal Evan Spero
Customer Number:	22045
Filer:	Bernard Patrick Tomsa/Fiona Archer
Filer Authorized By:	Bernard Patrick Tomsa
Attorney Docket Number:	TRCH0103PUSP3
Receipt Date:	08-JUL-2021
Filing Date:	19-JAN-2021
Time Stamp:	09:32:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$260
RAM confirmation Number	E202178032454757
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_TRCH0103PUSP3.PDF	1036237	no	10
			11d10b7ed71f5ed0ad1ac1a795b7ac281c65f1e6		
Warnings:					
Information:					
2	Foreign Reference	WO2001070538A2.PDF	9193310	no	159
			550923dc9c77b7aac99bfb4d9987a280cd76611e		
Warnings:					
Information:					
3	Transmittal Letter	IDS_transmittal_TRCH0103PUSP3.PDF	114557	no	2
			6ceae6be38ef7885e953753866fd699941b1fa4e		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30780	no	2
			0efaecef4cd76b8811168afc712b8bbeca356859		
Warnings:					
Information:					
Total Files Size (in bytes):			10374884		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

YECHEZKAL EVAN SPERO

Serial No.: 17/152,399

Filed: January 19, 2021

For: ADAPTIVE HEADLIGHT SYSTEM

Attorney Docket No.: TRCH0103PUSP3

Group Art Unit: 2844

Examiner: LE, TUNG X.

AMENDMENT UNDER 37 C.F.R. § 1.111

Mail Stop Amendment
Commissioner for Patents
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

In response to the Office Action mailed July 7, 2021, please amend the above-identified application as follows:

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A system, for a motor vehicle, comprising:
a plurality of headlamps, each comprising a plurality of LED light sources;
one or more processors; and
a memory storing instructions that, when executed by one or more of the one or more processors, enable the one or more processors to:
receive first data, including at least map data, indicating a road curvature upcoming along a road on which the motor vehicle is traveling;
determine a light change, the change adapting a light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction of the road curvature ahead of the motor vehicle and shaping light based at least in part on the road curvature; and
control at least a first plurality of the LED light sources to provide light based at least in part on the determined light change and prior to the motor vehicle reaching the road curvature.
2. (Original) The system of claim 1, wherein the determination of the light change includes selection of the first plurality of the LED light sources.
3. (Original) The system of claim 1, wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to reshape light based on the road curvature as the motor vehicle travels at least to or through the road curvature.
4. (Original) The system of claim 3, wherein the reshaping of light further includes control to at least one of the first plurality of LED light sources, or a second plurality of

LED light sources, including at least one LED light source different from the LED light sources of the first plurality of LED light sources, to provide reshaped light.

5. (Original) The system of claim 1, wherein the increase of light in the direction of the road curvature includes at least an increase of light emitted at a level below high-beam light and directed in the direction of the road curvature.

6. (Original) The system of claim 1, wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to:

determine a second light change, the second change adapting the light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction of a second road curvature ahead of the motor vehicle, determined based on at least one of the first data or second data including at least second map data, and the second change shaping light based at least in part on the second road curvature; and

control at least a second plurality of the LED light sources, having at least one LED light source different from the first plurality of LED light sources, to provide light based at least in part on the determined second light change and prior to the motor vehicle reaching the second road curvature.

7. (Original) The system of claim 1, wherein the increase of light in the direction of the road curvature includes at least one of expansion of the light pattern in the direction of the road curvature or an increase to intensity of light directed in the direction of the road curvature; and

wherein the determination of the light change includes determination of light changes to individual LEDs of the first plurality of LED light sources, at least one of the changes including at least one of:

a variation to at least one of intensity or color of individual LEDs of the first plurality of LED light sources, or

providing light directed in the direction of the road curvature from an LED not providing light directed in the direction of the road curvature prior to the change.

8. (Original) The system of claim 1, further comprising one or more cameras positioned to capture data indicating at least one other vehicle ahead of the motor vehicle;

wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to:

determine a position associated with the at least one other vehicle based at least in part on second data captured by at least one of the one or more cameras; and

control, based at least in part on the position, a second plurality of LED light sources providing light directed towards an area including at least a portion of the other vehicle to diminish glare to a driver of the other vehicle by a decrease to intensity of light directed towards and illuminating the area, the light that is directed towards and illuminating the area having lower intensity compared to light directed towards points laterally adjacent the area to either side.

9. (Original) The system of claim 8, wherein:

the first plurality and second plurality of LED light sources include at least one common LED light source;

the control of the second plurality of LED light sources is based at least in part on third data received from a non-camera sensor of the motor vehicle;

the position includes at least one of:

a distance associated with the at least one other vehicle,

at least one elevation associated with the at least one other vehicle, or

a position within image data captured by at least one of the cameras;

the first data includes data from a non-camera sensor of the motor vehicle;

either one of the control of the first plurality of LED light sources or control of the second plurality of LED light sources is subsequent to and accommodative of the other;

the control of the second plurality of LED light sources additionally includes termination of light from at least one LED providing light directed to the area prior to the termination; and

the light pattern includes at least one of an illumination pattern or an emission pattern of the headlamps.

10. (Original) The system of claim 1, further including one or more optical control elements for controlling light from one or more of the LED light sources.

11. (Original) The system of claim 10, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

12. (Original) A non-transitory computer-readable storage medium, storing instructions that, when executed by one or more processors of a motor vehicle that includes a plurality of headlamps that each comprise a plurality of LED light sources, enable the one or more processors to:

receive first data, including at least map data, indicating a road curvature upcoming along a road on which the motor vehicle is traveling;

determine a light change, the change adapting a light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction of the road curvature ahead of the motor vehicle and shaping light based at least in part on the road curvature; and

control at least a first plurality of the LED light sources to provide light based at least in part on the determined light change and prior to the motor vehicle reaching the road curvature.

13. (Original) The storage medium of claim 12, wherein the determination of the light change includes selection of the first plurality of the LED light sources.

14. (Original) The storage medium of claim 12, wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to reshape light based on the road curvature as the motor vehicle travels at least to or through the road curvature.

15. (Original) The storage medium of claim 14, wherein the reshaping of light further includes control to at least one of the first plurality of LED light sources, or a second

plurality of LED light sources, including at least one LED light source different from the LED light sources of the first plurality of LED light sources, to provide reshaped light.

16. (Original) The storage medium of claim 12, wherein the increase of light in the direction of the road curvature includes at least an increase of light emitted at a level below high-beam light and directed in the direction of the road curvature.

17. (Original) The storage medium of claim 12, wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to:

determine a second light change, the second change adapting the light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction of a second road curvature ahead of the motor vehicle, determined based on at least one of the first data or second data including at least second map data, and the second change shaping light based at least in part on the second road curvature; and

control at least a second plurality of the LED light sources, having at least one LED light source different from the first plurality of LED light sources, to provide light based at least in part on the determined second light change and prior to the motor vehicle reaching the second road curvature.

18. (Original) The storage medium of claim 12, wherein the increase of light in the direction of the road curvature includes at least one of expansion of the light pattern in the direction of the road curvature or an increase to intensity of light directed in the direction of the road curvature; and

wherein the determination of the light change includes determination of light changes to individual LEDs of the first plurality of LED light sources, at least one of the changes including at least one of:

a variation to at least one of intensity or color of individual LEDs of the first plurality, or

providing light directed in the direction of the road curvature from an LED not providing light directed in the direction of the road curvature prior to the change.

19. (Original) The storage medium of claim 12, wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to:

determine a position associated with at least one other vehicle based at least in part on second data indicating the at least one other vehicle and captured by at least one camera of the motor vehicle; and

control, based at least in part on the position, a second plurality of LED light sources providing light directed towards an area including at least a portion of the other vehicle to diminish glare to a driver of the other vehicle by a decrease to intensity of light directed towards and illuminating the area, the light that is directed towards and illuminating the area having lower intensity compared to light directed towards points laterally adjacent the area to either side.

20. (Original) The storage medium of claim 19, wherein:

the first plurality and second plurality of LED light sources include at least one common LED light source;

the control of the second plurality of LED light source is based at least in part on third data received from a non-camera sensor of the motor vehicle;

the position includes at least one of:

a distance associated with the at least one other vehicle,

at least one elevation associated with the at least one other vehicle, or

a position within image data captured by at least one of the cameras;

the first data includes data from a non-camera sensor of the motor vehicle;

either one of the control of the first plurality of LED light sources or control of the second plurality of LED light sources is subsequent to and accommodative of the other;

the control of the second plurality of LED light sources additionally includes termination of light from at least one LED providing light directed to the area prior to the termination; and

the light pattern includes at least one of an illumination pattern or an emission pattern of the headlamps.

21. (Original) The storage medium of claim 19, wherein the instructions include instructions that, when executed by the one or more processors, enable the one or more processors to utilize one or more optical control elements included in the motor vehicle to control light from at least the first plurality or second plurality of the LED light sources.

22. (Original) The storage medium of claim 21, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

23. (Original) A computer-implemented method for adapting light from headlamps of a motor vehicle to accommodate road shape changes, the headlamps including a plurality of LED light sources, comprising:

determining an upcoming shape change of a road, ahead of the motor vehicle, based on first data, including map data, indicating the shape change;

determining a light output, the output adapting a light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction associated with the shape change ahead of the motor vehicle and shaping light based on the shape change; and

prior to reaching the road shape change, causing at least a first plurality of the LED light sources to provide light based at least in part on the determined light output.

24. (Original) The method of claim 23, wherein the determining the light includes selecting the first plurality of the LED light sources.

25. (Original) The method of claim 23, further comprising reshaping light based on the shape change as the motor vehicle travels at least to or through the shape change.

26. (Original) The method of claim 25, wherein the reshaping light further includes controlling at least one of the first plurality of LED light sources, or a second plurality of LED light sources, including at least one LED light source different from the LED light sources of the first plurality of LED light sources, to provide reshaped light.

27. (Original) The method of claim 23, wherein the increase of light in the direction associated with the shape change includes at least light output that increases light emitted at a level below high-beam light and directed in the direction associated with shape change.

28. (Original) The method of claim 23, further comprising:
determining a second light output, the second output adapting the light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction associated with a second shape change ahead of the motor vehicle, determined based on at least one of the first data or second data including at least second map data, and the second output shaping light based at least in part on the second shape change; and

controlling at least a second plurality of the LED light sources, having at least one LED light source different from the first plurality of LED light sources, to provide light based at least in part on the determined second output and prior to the motor vehicle reaching the second shape change.

29. (Original) The method of claim 23, wherein the increase of light in the direction associated with the shape change includes at least one of expansion of the light pattern in the direction associated with the shape change or an increase to intensity of light directed in the direction associated with the shape change; and

wherein the determining the light output includes determining output for individual LEDs of the first plurality of LED light sources, the output including providing light directed in the direction associated with the shape change from an LED not providing light directed in the direction associated with the shape change prior to the change.

30. (Original) The method of claim 23, further comprising:
determining a position associated with at least one other vehicle based at least in part on second data indicating the at least one other vehicle and captured by at least one camera of the motor vehicle; and

controlling, based at least in part on the position, a second plurality of LED light sources providing light directed towards an area including at least a portion of the other vehicle to diminish glare to a driver of the other vehicle by decreasing intensity of light directed towards and illuminating the area, the light directed towards and illuminating the area having lower intensity compared to light directed towards points laterally adjacent the area to either side.

31. (Original) The method of claim 30, wherein:

the first plurality and second plurality of LED light sources include at least one common LED light source;

the controlling the second plurality of LED light sources is based at least in part on third data received from a non-camera sensor of the motor vehicle;

the position includes at least one of:

a distance associated with the at least one other vehicle,

at least one elevation associated with the at least one other vehicle, or

a position within image data captured by at least one of the cameras;

the first data includes data from a non-camera sensor of the motor vehicle;

either one of the determining the light output or controlling the second plurality of LED light sources is subsequent to and accommodative of the other;

the controlling the second plurality of LED light sources additionally includes terminating light from at least one LED providing light directed to the area prior to the terminating; and

the light pattern includes at least one of an illumination pattern or an emission pattern of the headlamps.

32. (Original) The method of claim 30, further comprising utilizing one or more optical control elements included in the motor vehicle to control light from at least the first plurality or second plurality of the LED light sources.

33. (Original) The method of claim 32, wherein the optical control elements include at least one of one or more reflectors, refractors or lenses.

Remarks

For at least the reasons presented, all claims are believed to be in condition for allowance. Favorable reconsideration and allowance are respectfully requested.

Applicant spoke with the Examiner briefly on 7/13/21, to discuss the priority date of the prior art relative to the priority date of the claims. No agreement was reached, and Applicant thus responds to the action below. Applicant thanks the Examiner for the call.

Claims 1-5, 12-16 and 23-27 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2010/0286896 issued to Yamada (hereinafter “*Yamada*”) in view of U.S. Publication No. 2012/0001547 issued to Nishitani et al. (hereinafter “*Nishitani*”).

Applicant’s support for claims 1-5, 12-16 and 23-27 was drawn from the original specification, U.S. Ser. No. 10/604,360, filed on July 14, 2003. See, e.g., the description of Figs. 14 and 15, such as, but not limited to:

- 1) [0211] in the present application and in the same form at [0179] in US 10/604,360
- 2) [0212] in the present application and in the same form at [0180] in US 10/604,360
- 3) [0215] in the present application and in the same form at [0183] in US 10/604,360
- 4) [0216] in the present application and in the same form at [0184] in US 10/604,360
- 5) [0221] in the present application and in the same form at [0189] in US 10/604,360
- 6) [0222] in the present application and in the same form at [0190] in US 10/604,360

As U.S. Ser. No. 10/604,360, has a filing date of July 14, 2003, and claims priority to a provisional application filed July 12, 2002, the claims are entitled to at least the 2003 priority date. Yamada was filed 9/12/06 and claims priority to a Japanese application filed on 10/12/05, and Nishitani was filed on 6/29/11 and claims priority to a Japanese application filed on 6/30/10. None of these dates precede the US priority date applicable to these particular instant claims, and withdrawal of the rejection is respectfully requested.

Please charge any fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

YECHEZKAL EVAN SPERO

By: /Bernard P. Tomsa/
Bernard P. Tomsa
Reg. No. 60,121
Attorney/Agent for Applicant

Date: July 14, 2021

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Southfield, MI 48075-1238
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Fax: 248-358-3351
\\

Electronic Acknowledgement Receipt

EFS ID:	43244588
Application Number:	17152399
International Application Number:	
Confirmation Number:	6274
Title of Invention:	ADAPTIVE HEADLIGHT SYSTEM
First Named Inventor/Applicant Name:	Yechezkal Evan Spero
Customer Number:	22045
Filer:	Bernard Patrick Tomsa/Julie Oumedian
Filer Authorized By:	Bernard Patrick Tomsa
Attorney Docket Number:	TRCH0103PUSP3
Receipt Date:	14-JUL-2021
Filing Date:	19-JAN-2021
Time Stamp:	15:07:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		TRCH0103PUSP3_Amendment. PDF	9613610	yes	12
			31604d2e30a3254874d0643d202401d48a b9a22e		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	10
	Applicant Arguments/Remarks Made in an Amendment	11	12
Warnings:			
Information:			
Total Files Size (in bytes):		9613610	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 17/152,399		Filing Date 01/19/2021		☐ To be Mailed			
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO											
APPLICATION AS FILED - PART I											
		(Column 1)		(Column 2)							
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A		N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		x \$100 =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		x \$480 =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL					
APPLICATION AS AMENDED - PART II											
AMENDMENT	(Column 1)		(Column 2)		(Column 3)						
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	07/14/2021		Total (37 CFR 1.16(i))		* 33		Minus		** 33		
	Total (37 CFR 1.16(i))		* 33		Minus		** 33		= 0		
	Independent (37 CFR 1.16(h))		* 3		Minus		*** 3		= 0		
☐ Application Size Fee (37 CFR 1.16(s))											
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE		0			
AMENDMENT	(Column 1)		(Column 2)		(Column 3)						
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		*		Minus		**		=		
	Total (37 CFR 1.16(i))		*		Minus		**		x \$0 =		
	Independent (37 CFR 1.16(h))		*		Minus		***		x \$0 =		
☐ Application Size Fee (37 CFR 1.16(s))											
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE		0			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE					
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/ANTJUAN M RIVERA/					
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".											
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

22045 7590 11/08/2021
Brooks Kushman
1000 Town Center
22nd Floor
Southfield, MI 48075

EXAMINER	
LE, TUNG X	
ART UNIT	PAPER NUMBER
2844	

DATE MAILED: 11/08/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/152,399	01/19/2021	Yechezkal Evan Spero	TRCH0103PUSP3	6274

TITLE OF INVENTION: ADAPTIVE HEADLIGHT SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	02/08/2022

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22045 7590 11/08/2021
Brooks Kushman
1000 Town Center
22nd Floor
Southfield, MI 48075

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/152,399	01/19/2021	Yechezkal Evan Spero	TRCH0103PUSP3	6274

TITLE OF INVENTION: ADAPTIVE HEADLIGHT SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	02/08/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
LE, TUNG X	2844	315-152000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29☐ Applicant asserting small entity status. See 37 CFR 1.27☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/152,399	01/19/2021	Yechezkal Evan Spero	TRCH0103PUSP3	6274
22045	7590	11/08/2021	EXAMINER	
Brooks Kushman 1000 Town Center 22nd Floor Southfield, MI 48075			LE, TUNG X	
			ART UNIT	PAPER NUMBER
			2844	

DATE MAILED: 11/08/2021

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 17/152,399	Applicant(s) Spero, Yechezkal Evan	
	Examiner TUNG X LE	Art Unit 2844	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/14/2021.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-33. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>7/8/2021</u> . 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____.
---	--

/TUNG X LE/ Primary Examiner, Art Unit 2844	
--	--

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

This Office Action is in response to the Applicant's amendment submitted on July 14, 2021. In virtue of this amendment, claims 1-33 are now pending in the instant application.

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 7/8/2021 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Allowable Subject Matter

2. Claims **1-33** are allowed.

3. The following is an examiner's statement of reasons for allowance:

Prior art of record fails to disclose or fairly suggest the following limitations:

A system, for a motor vehicle, comprising ... *"the one or more processors to receive first data, including at least map data, indicating a road curvature upcoming along a road on which the motor vehicle is traveling; determine a light change, the change adapting a light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction of the road curvature ahead of the motor vehicle and shaping light based at least in part on the road curvature; and control at least a first plurality of the LED light sources to provide light based at least in part on the determined light change and prior to the motor vehicle reaching the road curvature"*, in combination with the remaining claimed limitations as claimed in independent claim 1 (claims 2-11 are allowed as being dependent on claim 1).

A non-transitory computer-readable storage medium, storing instructions that, when executed by one or more processors of a motor vehicle ... *“the one or more processors to receive first data, including at least map data, indicating a road curvature upcoming along a road on which the motor vehicle is traveling; determine a light change, the change adapting a light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction of the road curvature ahead of the motor vehicle and shaping light based at least in part on the road curvature; and control at least a first plurality of the LED light sources to provide light based at least in part on the determined light change and prior to the motor vehicle reaching the road curvature”*, in combination with the remaining claimed limitations as claimed in independent claim 12 (claims 13-22 are allowed as being dependent on claim 12).

A computer-implemented method for adapting light from headlamps of a motor vehicle ... comprising *“determining an upcoming shape change of a road, ahead of the motor vehicle, based on first data, including map data, indicating the shape change; determining a light output, the output adapting a light pattern of the headlamps in at least one of color, intensity or spatial distribution to increase light in a direction associated with the shape change ahead of the motor vehicle and shaping light based on the shape change; and prior to reaching the road shape change, causing at least a first plurality of the LED light sources to provide light based at least in part on the determined light output”*, in combination with the remaining claimed limitations as claimed in independent claim 23 (claims 24-33 are allowed as being dependent on claim 23).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Prior art Stam et al. – US 6,049,171

Prior art Schofield et al. – US 5,796,094

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TUNG X LE whose telephone number is (571)272-6010. The examiner can normally be reached Monday to Friday from 10am to 6pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy C Johnson can be reached on 571-272-2238. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 17/152,399
Art Unit: 2844

Page 5

/TUNG X LE/
Primary Examiner, Art Unit 2844
October 22, 2021

<i>Notice of References Cited</i>	Application/Control No. 17/152,399	Applicant(s)/Patent Under Reexamination Spero, Yechezkal Evan	
	Examiner TUNG X LE	Art Unit 2844	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6049171-A	04-2000	Stam; Joseph S.	B60Q1/1423	315/82
*	B	US-5796094-A	08-1998	Schofield; Kenneth	B60N2/002	250/208.1
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 17/152,399	Applicant(s)/Patent Under Reexamination Spero, Yechezkal Evan
	Examiner TUNG X LE	Art Unit 2844

CPC - Searched*		
Symbol	Date	Examiner
B60Q: 1/04, 1/085, 1/1423, 2300/112, 2300/134	07/01/2021	TXL
updated above	10/22/2021	TXL

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
EAST (see search history printout)	07/01/2021	TXL
CPC Searches	07/01/2021	TXL
Inventor and Assignee Searches	07/01/2021	TXL
Citations: Forward and Backward	07/01/2021	TXL
Updated EAST (see search history printout)	10/22/2021	TXL

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
B60Q	1/085, 1/1423	10/22/2021	TXL

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Issue Classification 	Application/Control No. 17/152,399	Applicant(s)/Patent Under Reexamination Spero, Yechezkal Evan	
	Examiner TUNG X LE	Art Unit 2844	

CPC						
Symbol					Type	Version
B60Q	/	1	/	04	F	2013-01-01
F21K	/	9	/	23	I	2016-08-01
F21K	/	9	/	232	I	2016-08-01
B60Q	/	1	/	085	I	2013-01-01
B60Q	/	1	/	1423	I	2013-01-01
F21V	/	19	/	02	I	2013-01-01
F21V	/	23	/	0471	I	2013-01-01
F21V	/	23	/	0464	I	2013-01-01
F21V	/	23	/	0478	I	2013-01-01
F21S	/	4	/	28	I	2016-01-01
F21S	/	41	/	143	I	2018-01-01
F21S	/	41	/	147	I	2018-01-01
F21S	/	41	/	65	I	2018-01-01
H05B	/	47	/	105	I	2020-01-01
H05B	/	45	/	20	I	2020-01-01
H05B	/	47	/	10	I	2020-01-01
H05B	/	47	/	11	I	2020-01-01
F21S	/	41	/	153	I	2018-01-01
H05B	/	47	/	115	I	2020-01-01
H05B	/	45	/	395	I	2020-01-01
H05B	/	3	/	008	I	2013-01-01
F21V	/	29	/	74	A	2015-01-15
F21Y	/	2115	/	10	A	2016-08-01
B60Q	/	2300	/	054	A	2013-01-01
B60Q	/	2300	/	112	A	2013-01-01
B60Q	/	2300	/	116	A	2013-01-01
B60Q	/	2300	/	122	A	2013-01-01
B60Q	/	2300	/	134	A	2013-01-01
B60Q	/	2300	/	142	A	2013-01-01
B60Q	/	2300	/	21	A	2013-01-01
B60Q	/	2300	/	23	A	2013-01-01

NONE		Total Claims Allowed:	
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/TUNG X LE/ Primary Examiner, Art Unit 2844	22 October 2021	O.G. Print Claim(s)	O.G. Print Figure
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Issue Classification 	Application/Control No. 17/152,399	Applicant(s)/Patent Under Reexamination Spero, Yechezkal Evan
	Examiner TUNG X LE	Art Unit 2844

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Issue Classification 	Application/Control No. 17/152,399	Applicant(s)/Patent Under Reexamination Spero, Yechezkal Evan
	Examiner TUNG X LE	Art Unit 2844

INTERNATIONAL CLASSIFICATION			
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US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
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Issue Classification 	Application/Control No. 17/152,399	Applicant(s)/Patent Under Reexamination Spero, Yechezkal Evan
	Examiner TUNG X LE	Art Unit 2844

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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"6018308"	"6049171"				

		"6097023" "6102546" "6130421" "6140933" "6144158" "6166698" "6184781" "6255639" "6281632" "6329925" "6349782" "6356376" "6379013" "6396040" "6396397" "6403942" "6442465" "6443602" "6465962" "6469739" "6483438" "6507779" "6617564").PN. OR ("6861809").URPN.				
L28	8	("20020036901" "20100188864" "20160039286" "20170136939" "20170158112" "20180099605" "6220735" "6861809").PN. OR ("10953790").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2021/10/22 10:05
L29	457	25 not 26	US-PGPUB; USPAT; USOCR	OR	ON	2021/10/22 10:12
L30	145	("20020040962" "2131888" "2632040" "2827594" "3179845" "3581276" "4139801" "4236099" "4357558" "4376909" "4599544" "4665321" "4692798" "4727290" "4768135" "4862037" "4891559" "4930742" "4967319" "5036437" "5072154" "5086253" "5124549" "5166681" "5182502" "5187383" "5235178" "5329206" "5416318" "5426294" "5434407" "5451822" "5471515" "5508592" "5537003"	US-PGPUB; USPAT; USOCR	OR	ON	2021/10/22 10:18

		"5550677" "5614788" "5660454" "5666028" "5707129" "5715093" "5796094" "5811888" "5812321" "5835613" "5837994" "5841126" "5877897" "5912534" "5923027" "5942853" "5990469" "6008486" "6049171" "6097023" "6130421" "6144158" "6166698" "6329925" "6349782" "6356376" "6396397" "6465962" "6507779").PN. OR ("6728393").URPN.				
L31	1	(vehicle and headlamp and LED.u/c. and processor and memory and (data with map with road with curvature) and (light with pattern with color with shap\$3)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2021/10/22 10:24
L32	233	("2449338" "3348095" "3385998" "3414763" "3430100" "3764816" "3993914" "4667129" "4684819" "4686423" "4831310" "4841199" "4862036" "4899083" "4956562" "5136209" "5185558" "5614788" "5666028").PN. OR ("5912534").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2021/10/22 11:33

10/22/2021 11:34:11 AM

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BIB DATA SHEET

CONFIRMATION NO. 6274

SERIAL NUMBER 17/152,399	FILING or 371(c) DATE 01/19/2021 RULE	CLASS 315	GROUP ART UNIT 2844	ATTORNEY DOCKET NO. TRCH0103PUSP3		
APPLICANTS INVENTORS Yechezkal Evan Spero, Tifrach, ISRAEL; ** CONTINUING DATA ***** This application is a CON of 15/961,861 04/24/2018 PAT 10894503 which is a CON of 13/357,549 01/24/2012 PAT 9955551 which is a CIP of 10/604,360 07/14/2003 PAT 8100552 which claims benefit of 60/395,308 07/12/2002 and said 13/357,549 01/24/2012 claims benefit of 61/535,981 09/17/2011 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 02/23/2021						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/TUNG X LE/</u> Examiner's Signature		☐ Met after Allowance TXL Initials	STATE OR COUNTRY ISRAEL	SHEETS DRAWINGS 24	TOTAL CLAIMS 33	INDEPENDENT CLAIMS 3
ADDRESS Brooks Kushman 1000 Town Center 22nd Floor Southfield, MI 48075 UNITED STATES						
TITLE ADAPTIVE HEADLIGHT SYSTEM						
FILING FEE RECEIVED 3540	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees		
				☐ 1.16 Fees (Filing)		
				☐ 1.17 Fees (Processing Ext. of time)		
				☐ 1.18 Fees (Issue)		
				☐ Other _____		
				☐ Credit		

Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 11/30/2020. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17152399
	Filing Date		2021-01-19
	First Named Inventor		YECHEZKAL EVAN SPERO
	Art Unit		2844
	Examiner Name	LE, TUNG X	
	Attorney Docket Number		TRCH0103PUSP3

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	3,316,442	A	1967-04-25	Konrad	
	2	4,597,033	A	1986-06-24	Meggs et al.	
	3	5,018,290	A	1991-05-28	Kozek et al.	
	4	5,033,099	A	1991-07-16	Yamada et al.	
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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17152399
Filing Date		2021-01-19
First Named Inventor	YECHEZKAL EVAN SPERO	
Art Unit	2844	
Examiner Name	LE, TUNG X	
Attorney Docket Number	TRCH0103PUSP3	

9	5,749,646	A	1998-05-12	Brittell	
10	5,785,243	A	1998-07-28	Cross	
11	5,803,579	A	1998-09-08	Turnbull	
12	5,921,660	A	1999-07-13	Yu	
13	5,969,754	A	1999-10-19	Zeman	
14	5,983,161	A	1999-11-09	Lemelson et al.	
15	5,994,844	A	1999-11-30	Crawford et al.	
16	6,046,549	A	2000-04-04	James	
17	6,149,283	A	2000-11-21	Conway et al.	
18	6,166,496	A	2000-12-26	Lys et al.	
19	6,227,679	B1	2001-05-08	Zhang et al.	

**INFORMATION DISCLOSURE
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First Named Inventor	YECHEZKAL EVAN SPERO	
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Examiner Name	LE, TUNG X	
Attorney Docket Number	TRCH0103PUSP3	

	20	6,281,632	B1	2001-08-28	Stam et al.	
	21	6,340,868	B1	2002-01-22	Lys et al.	
	22	6,346,777	B1	2002-02-12	Kim	
	23	6,379,022	B1	2002-04-30	Amerson et al.	
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	26	6,406,172	B1	2002-06-18	Harbers et al.	
	27	6,483,439	B1	2002-11-19	Vukosic	
	28	6,498,440	B2	2002-12-24	Stam et al.	
	29	6,499,860	B2	2002-12-31	Begemann	
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First Named Inventor	YECHEZKAL EVAN SPERO
Art Unit	2844
Examiner Name	LE, TUNG X
Attorney Docket Number	TRCH0103PUSP3

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33	6,820,998	B2	2004-11-23	Chen	
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40	6,861,809	B2	2005-03-01	Stam	

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First Named Inventor	YECHEZKAL EVAN SPERO	
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Examiner Name	LE, TUNG X	
Attorney Docket Number	TRCH0103PUSP3	

Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	20010014019	A1	2001-08-16	Begemann	
	2	20020022774	A1	2002-02-21	Karnieli	
	3	20020022927	A1	2002-02-21	Lemelson et al.	
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Examiner Name	LE, TUNG X	
Attorney Docket Number	TRCH0103PUSP3	

11	20040061605	A1	2004-04-01	Howard	
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13	20040138726	A1	2004-07-15	Savage et al.	
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18	20100302779	A1	2010-12-02	Chemel	
19	20100052550	A1	2010-03-04	Kobayashi	
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First Named Inventor	YECHEZKAL EVAN SPERO
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Examiner Name	LE, TUNG X
Attorney Docket Number	TRCH0103PUSP3

22	20120091897	A1	2012-04-19	O et al.
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26	20130258688	A1	2013-10-13	Kalapodas

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	2001070538	WO	A2	2001-09-27	Stam et al.		

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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Art Unit	2844
Examiner Name	LE, TUNG X
Attorney Docket Number	TRCH0103PUSP3

EXAMINER SIGNATURE

Examiner Signature	/TUNG X LE/	Date Considered	10/22/2021
--------------------	-------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17152399
Filing Date	2021-01-19
First Named Inventor	YECHEZKAL EVAN SPERO
Art Unit	2844
Examiner Name	LE, TUNG X
Attorney Docket Number	TRCH0103PUSP3

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Bernard P. Tomsa/	Date (YYYY-MM-DD)	2021-07-07
Name/Print	Bernard P. Tomsa	Registration Number	60,121

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

YECHEZKAL EVAN SPERO

Serial No.: 17/152,399

Filed: January 19, 2021

For: ADAPTIVE HEADLIGHT SYSTEM

Attorney Docket No.: TRCH0103PUSP3

Group Art Unit: 2844

Examiner: LE, TUNG X.

**AMENDMENT AFTER ALLOWANCE
UNDER 37 C.F.R. § 1.312**

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Alexandria, VA 22313-1450

Commissioner:

Please amend the above-identified application as follows:

Amendments to the Specification:

Please amend numbered paragraph [0001], as shown below:

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a Continuation of pending U.S. patent application Ser. No. 15/961,861 filed Apr. 24, 2018, now U.S. Patent No. 10,894,503 which issued January 19, 2021 which is a Continuation of U.S. patent application Ser. No. 13/357,549 filed Jan. 24, 2012, now U.S. Patent No. 9,955,551 which issued Apr. 24, 2018, which is a Continuation-in-Part of U.S. patent application Ser. No. 10/604,360, entitled “Multiple Light-Source Illuminating System” filed on Jul. 14, 2003, now U.S. Patent No. 8,100,552 which issued on Jan. 24, 2012, which claims benefit under 35 U.S.C., § 119(e) of U.S. Provisional Application No. 60/395,308 filed Jul. 12, 2002, entitled “Multiple Light Source Illumination System”. U.S. patent application Ser. No. ~~13,357,549~~ 13/357,549 filed Jan. 24, 2012, also claims benefit of U.S. Provisional Application No. 61/535,981 filed Sept. 17, 2011 entitled “Adjustable Light Fixture”. The entire content of the disclosures are all expressly incorporated herein by reference.

Remarks

In this amendment, Applicant has amended paragraph [0001] Cross-Reference to Related Applications to correct a typographical error. No new matter has been added. Please charge any fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

YECHEZKAL EVAN SPERO

By: /Bernard P. Tomsa/
Bernard P. Tomsa
Reg. No. 60,121
Attorney for Applicant

Date: November 10, 2021

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351

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Bernard P. Tomsa	(Typed or printed name)
/Bernard P. Tomsa/	(Signature)
November 10, 2021	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/152,399	01/19/2021	Yechezka Eyan Spero	TRCH0103FUSP3	6274

TITLE OF INVENTION: ADAPTIVE HEADLIGHT SYSTEM

APPL. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	02/08/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
LE, TUNG X	2844	315-152000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. Use of a Customer Number is required.

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(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Brooks Kushman P.C.

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

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Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

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☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 02-3978

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Bernard P. Tomsa/

Date November 10, 2021

Typed or printed name Bernard P. Tomsa

Registration No. 60,121

Electronic Patent Application Fee Transmittal				
Application Number:		17152399		
Filing Date:		19-Jan-2021		
Title of Invention:		ADAPTIVE HEADLIGHT SYSTEM		
First Named Inventor/Applicant Name:		Yechezkal Evan Spero		
Filer:		Bernard Patrick Tomsa/Claire Flood		
Attorney Docket Number:		TRCH0103PUSP3		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1200

Electronic Acknowledgement Receipt

EFS ID:	44251972
Application Number:	17152399
International Application Number:	
Confirmation Number:	6274
Title of Invention:	ADAPTIVE HEADLIGHT SYSTEM
First Named Inventor/Applicant Name:	Yechezkal Evan Spero
Customer Number:	22045
Filer:	Bernard Patrick Tomsa/Claire Flood
Filer Authorized By:	Bernard Patrick Tomsa
Attorney Docket Number:	TRCH0103PUSP3
Receipt Date:	10-NOV-2021
Filing Date:	19-JAN-2021
Time Stamp:	16:51:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 1200
RAM confirmation Number	E2021A0G53074522
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	TRCH0103PUSP3_Comments_on_Reasons_for_Allowance.PDF	81388	no	2
			2cd98ac4910d23c021de9b3658203d4bcade5a73		
Warnings:					
Information:					
2		TRCH0103PUSP3_Amendment_After_Allowance.pdf	124330	yes	3
			f404448c52ec5d7932e9b815b746d42a2df9cbcd4		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment after Notice of Allowance (Rule 312)		1	1	
	Specification		2	2	
	Applicant Arguments/Remarks Made in an Amendment		3	3	
Warnings:					
Information:					
3	Issue Fee Payment (PTO-85B)	TRCH0103PUSP3_Issue_Fee_Transmittal.PDF	626735	no	1
			a8b3d04d9ead03b987f1336e5ef22f7f0d009d1f		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	37785	no	2
			a65d4f8db13dc3184061a9cf506c7a1e239cd0339		
Warnings:					
Information:					
Total Files Size (in bytes):			870238		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

YECHEZKAL EVAN SPERO

Serial No.: 17/152,399

Filed: January 19, 2021

For: ADAPTIVE HEADLIGHT SYSTEM

Attorney Docket No.: TRCH0103PUSP3

Group Art Unit: 2844

Examiner: LE, TUNG X

**COMMENTS ON STATEMENT
OF REASONS FOR ALLOWANCE**

Mail Stop Issue Fee
Commissioner for Patents
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

In response to the Examiner's Statement of Reasons for Allowance contained in the Notice of Allowance mailed November 8, 2021, Applicant submits the following comments:

Remarks

Applicant thanks the Examiner for the allowance of the indicated claims, and while Applicant agrees that the claims are allowable over the prior art, Applicant notes that the reasons listed for allowance are not necessarily the exclusive reasons for allowance, and instead represent sufficient reasons for allowance. Accordingly, Applicant reserves all future rights to take any position that the claims are allowable for a variety of additional and/or alternative reasons if any of the claims should come under scrutiny for any reason, if anyone questions the present reasons for allowance, and/or for any other reasonable and necessary purpose as determined by Applicant.

Respectfully submitted,

YECHEZKAL EVAN SPERO

By: /Bernard P. Tomsa/
Bernard P. Tomsa
Reg. No. 60,121
Attorney for Applicant

Date: November 10, 2021

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/152,399	01/19/2021	Yechezkal Evan Spero	TRCH0103PUSP3	6274
22045	7590	11/26/2021	EXAMINER	
Brooks Kushman			LE, TUNG X	
1000 Town Center			ART UNIT	
22nd Floor			PAPER NUMBER	
Southfield, MI 48075			2844	
			NOTIFICATION DATE	
			DELIVERY MODE	
			11/26/2021	
			ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@brookskushman.com
kdilucia@brookskushman.com

Response to Rule 312 Communication	Application No. 17/152,399	Applicant(s) Spero, Yechezkal Evan	
	Examiner TUNG X LE	Art Unit 2844	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

1. ☒ The amendment filed on 10 November 2021 under 37 CFR 1.312 has been considered, and has been:

- a) ☒ entered.
- b) ☐ entered as directed to matters of form not affecting the scope of the invention.
- c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.
- d) ☐ disapproved. See explanation below.
- e) ☐ entered in part. See explanation below.

Applicant's amendment to specification in paragraph [0001] has been entered.

/TUNG X LE/ Primary Examiner, Art Unit 2844	
--	--

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

YECHEZKAL EVAN SPERO

Serial No.: 17/152,399

Filed: January 19, 2021

For: ADAPTIVE HEADLIGHT SYSTEM

Attorney Docket No.: TRCH0103PUSP3

Group Art Unit: 2844

Examiner: LE, TUNG X.

**AMENDMENT AFTER ALLOWANCE
UNDER 37 C.F.R. § 1.312**

Mail Stop Issue Fee
Commissioner for Patents
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Please amend the above-identified application as follows:



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/152,399	12/28/2021	11208029	TRCH0103PUSP3	6274

22045 7590 12/08/2021

Brooks Kushman
1000 Town Center
22nd Floor
Southfield, MI 48075

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Yechezkal Evan Spero, Tifrach, ISRAEL;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
 filed in the U.S. District Court _____ for the District of Delaware _____ on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO.	DATE FILED 6/7/2022	U.S. DISTRICT COURT for the District of Delaware
PLAINTIFF Torchlight Technologies LLC		DEFENDANT Daimler AG, et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,955,551	4/24/2018	Yechezkal Evan Spero
2 10,894,503	1/19/2021	Yechezkal Evan Spero
3 11,208,029	12/28/2021	Yechezkal Evan Spero
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
 Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
---	---

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
filed in the U.S. District Court **for the District of Delaware** on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT for the District of Delaware
PLAINTIFF Torchlight Technologies LLC		DEFENDANT General Motors LLC, General Motors Holdings LLC, and General Motors Company
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,955,551	4/24/2018	Yechezkal Evan Spero
2 10,894,503	1/19/2021	Yechezkal Evan Spero
3 11,208,029	12/28/2021	Yechezkal Evan Spero
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy