**IN THE UNITED STATES DISTRICT COURT**
**FOR THE DISTRICT OF DELAWARE**

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|---|---|
| TORCHLIGHT TECHNOLOGIES LLC,<br><br>*Plaintiff*,<br><br>v.<br><br>DAIMLER AG, MERCEDES-BENZ USA, LLC, VOLKSWAGEN AG, VOLKSWAGEN GROUP OF AMERICA, INC., AUDI AG, AUDI OF AMERICA, LLC, PORSCHE AG, AND PORSCHE CARS NORTH AMERICA, INC.,<br><br>*Defendants*. | Civil Action No. 22-751 (VAC)<br><br>**JURY TRIAL DEMANDED** |

**FIRST AMENDED COMPLAINT FOR PATENT**

**INFRINGEMENT**

Plaintiff, Torchlight Technologies LLC ("Torchlight" of "plaintiff"), for its Complaint against Daimler AG, Mercedes-Benz USA, LLC, Volkswagen AG, Volkswagen Group of America, Inc., Audi AG, Audi of America, LLC, Porsche AG, and Porsche Cars North America, (collectively "Defendants"), states the following:

## I. THE PARTIES

**PLAINTIFF, TORCHLIGHT TECHNOLOGIES LLC**

1. Plaintiff Torchlight Technologies LLC ("Torchlight" or "plaintiff") is a Delaware limited liability company with its registered office located at Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, and with its principal place of business located at 767 Fifth Ave. Fl. 9, New York, NY 10153.

**DAIMLER AND MERCEDES-BENZ DEFENDANTS**

2. Upon information and belief, Daimler AG ("Daimler AG") is a German corporation having its principal place of business in Stuttgart, Germany.

3. Upon information and belief, Daimler AG is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components under Daimler brands, such as Mercedes-Benz, in all 50 states, including in this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and such motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of Daimler AG.

4. Upon information and belief, Mercedes-Benz USA, LLC ("Mercedes-Benz USA") is a wholly owned subsidiary of Daimler AG.

5. Upon information and belief, Mercedes-Benz USA is a Delaware limited liability company, with its registered office located at The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801, and with its principal place of business located at 1 Mercedes-Benz Drive, Sandy Springs, Georgia.

6. Upon information and belief, Mercedes-Benz USA is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components, including Mercedes-Benz branded motor vehicles and components, in all 50 states, including this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and such motor vehicles and components are imported, used, offered for sale,

sold and/or made in the United States, including in this District, by and/or on behalf of Mercedes-Benz USA.

**VOLKSWAGEN, AUDI, AND PORSCHE DEFENDANTS**

7. Upon information and belief, Volkswagen AG ("VW AG") is a German corporation having its principal place of business in Wolfsburg, Germany.

8. Upon information and belief, VW AG is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components under VW AG brands, such as Volkswagen, Audi, and Porsche, in all 50 states, including in this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and such motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of VW AG.

9. Upon information and belief, Audi AG ("Audi AG") is a German corporation having its principal place of business in Ingolstadt, Germany.

10. Upon information and belief, Audi AG is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components, such as Audi branded motor vehicles and components, in all 50 states, including in this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and such motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of Audi AG.

11. Upon information and belief, Dr. Ing. h.c. F. Porsche AG ("Porsche AG") is a German corporation having its principal place of business located in Stuttgart, Germany.

12. Upon information and belief, Porsche AG is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components, such as Porsche branded motor vehicles and components, in all 50 states, including in this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and such motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of Porsche AG.

13. Upon information and belief, Volkswagen Group of America Inc. ("VW America"), is a corporation organized and existing under the laws of the State of New Jersey, with its principal place of business located at 2200 Ferdinand Porsche Drive, Herndon, Virginia, and is registered as a Delaware foreign corporation that may be served through its registered agent at The Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

14. Upon information and belief, VW AG is the parent corporation of VW America, Audi AG, and Porsche AG.

15. Upon information and belief, Porsche AG is a wholly owned subsidiary of VW AG.

16. Upon information and belief, VW America is a wholly owned subsidiary of VW AG.

17. Upon information and belief, VW America is a U.S. sales arm of VW AG (collectively referred to as "VW AG/America").

18. Upon information and belief, VW AG/America is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components under Volkswagen brands, such as VW, Audi, and Porsche (collectively referred to as "VW motor vehicles"), in all 50 states, including this

District, including VW motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and such VW motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of VW AG/America.

19. Upon information and belief, Audi of America, LLC ("Audi America") is a Delaware corporation, with its registered office located at Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808, and with its principal place of business located at 2200 Woodland Pointe Avenue, Herndon Virginia.

20. Upon information and belief, VW America does business as Audi of America, LLC. ("Audi America").

21. Upon information and belief, Audi America is at least 99% owned by Audi AG

22. Upon information and belief, Audi America is a U.S. sales and marketing arm of VW AG.

23. Upon information and belief, Audi America is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components, such as Audi branded motor vehicles and components, in all 50 states, including this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and that such motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of Audi America.

24. Upon information and belief, Porsche Cars North America, Inc. ("Porsche America") is a wholly-owned U.S. subsidiary of Porsche AG.

25. Upon information and belief, Porsche America is a Delaware corporation with its principal place of business located at 1 Porsche Drive, Atlanta, Georgia 30354, and with its registered office located at The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801.

26. Upon information and belief, Porsche America is responsible for and/or is in the business of designing, manufacturing, importing, advertising, marketing, distributing, offering to sell and/or selling motor vehicles and components, such as Porsche branded motor vehicles and components, in all 50 states, including this District, including motor vehicles having certain vehicle illuminating devices and components of such devices that are accused of infringement herein, and that such motor vehicles and components are imported, used, offered for sale, sold and/or made in the United States, including in this District, by and/or on behalf of Porsche America.

## II. JURISDICTION AND VENUE

27. This is a civil action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. §§ 1 *et seq*., including 35 U.S.C. §§ 271, 281, and 284-285.

28. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

29. This Court has personal jurisdiction over the Defendants because Defendants have minimum contacts within the State of Delaware and in the District of Delaware and they have purposefully availed themselves of the privileges of conducting business in the United States, and more specifically in Delaware and this District. Defendants have sought protection and benefit from the laws of the State of Delaware by placing infringing products into the stream of commerce

through an established distribution channel with the awareness and/or intent that they will be purchased by consumers in this District.

30. This Court also has personal jurisdiction over Defendants because they regularly transact with entities and individuals in the State of Delaware including one or more dealerships located in the State of Delaware, and because they manufacture and distribute infringing motor vehicles and other infringing products that they purposefully direct into the State of Delaware, including this District, or at least place into the stream of commerce via established distribution channels with the knowledge and expectation that they will be sold in the State of Delaware and this District.

31. This Court also has personal jurisdiction over Mercedes-Benz USA, Audi America, and Porsche America because they are incorporated in the State of Delaware.

32. On information and belief, Defendants have significant ties to, and presence in, this District, making venue in this District both proper and convenient for this action.

33. Venue is also proper in this District as to Mercedes-Benz USA, Audi America, and Porsche America under 28 U.S.C. §§ 1391(b)-(c), 1400(b) because they were formed under the laws of the State of Delaware and therefore reside in this District and are subject to personal jurisdiction in this District.

34. Venue is also proper in this district under 28 U.S.C. § 1391(b)-(c) as to Daimler AG, VW AG, Audi AG, Porsche AG, because they are not incorporated in any of the United States.

35. Venue is also proper in this District as to Daimler AG, Mercedes-Benz USA, VW AG, Audi America Audi AG, Porsche AG, and Porsche America under at least 28 U.S.C. § 1400(b) because, upon information and belief at least part of the infringing activities of each take place in the State of Delaware and this District.

36. Venue is also proper in this District as to VW America under at least 28 U.S.C. § 1400(b) because: (A) at least part of its infringing activities take place in the State of Delaware and this District; and (B) upon information and belief, it owns and does business as Audi America, a Delaware Corporation residing in this District, with both having a common registered office located at Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

## III. BACKGROUND

37. On April 24, 2018 and August 19, 2022 respectively, U.S. Patent Nos. 9,955,551 B2 and 9,955,551 C1 (together "the '551 patent") entitled "Detector Controlled Illuminating System" were duly and legally issued. (*See* Exhibit 1, U.S. Patent Nos. 9,955,551 B2 and C1.)

38. Torchlight is the exclusive licensee of the '551 patent, with the right to enforce the '551 patent, and the right to sue Defendants for infringement and recover past damages.

39. On January 19, 2021, U.S. Patent No. 10,894,503 ("the '503 patent") entitled "Detector Controlled Headlight System" was duly and legally issued. (*See* Exhibit 2, U.S. Patent No. 10,894,503.)

40. Torchlight is the exclusive licensee of the '503 patent, with the right to enforce the '503 patent, and the right to sue Defendants for infringement and recover past damages.

41. On December 28, 2021, U.S. Patent No. 11,208,029 ("the '029 patent") entitled "Adaptive Headlight System" was duly and legally issued. (*See* Exhibit 3, U.S. Patent No. 11,208,029.)

42. Torchlight is the exclusive licensee of the '029 patent, with the right to enforce the '029 patent, and the right to sue Defendants for infringement and recover past damages.

## IV. COUNT I – INFRINGEMENT OF THE '551 PATENT BY DAIMLER AG AND MERCEDES-BENZ USA

43. Torchlight realleges the preceding paragraphs as though set forth fully herein.

44. Daimler AG and Mercedes-Benz USA (collectively "Daimler/Mercedes") have infringed one or more claims of the '551 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

45. Such infringement is described below based on publicly available information with respect to example claim 1 as to the example Daimler/Mercedes Multi-Row Headlamp system having 84 separately controllable LEDs ("Multi-Row Headlamp system"). On information and belief, Daimler/Mercedes has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

46. The preamble of Claim 1 refers to a device "for illuminating an area to be lit capable of automatically meeting specific illumination requirements of different sub-areas within the area to be lit. . . ." On information and belief, Daimler/Mercedes vehicles equipped with the Multi-Row Headlamp system include a device for illuminating an area to be lit and the system automatically meets the specific illumination requirements of different sub-areas within the area to be lit. This is evidenced, for example by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M3 provides the following:

> [T]he next generation on the new E-Class uses a newly developed, high-resolution precision LED module as a grid light source, fitted with 84 high-performance LED chips. This is able to react even more dynamically, and the light illuminating the road is high-resolution and even more precise. . . .
>
> Each one of these LEDs can be individually electronically controlled. "Gridding" the light in this way allows the light distribution from the right and left headlamps

> to be controlled entirely separately and adapted to the traffic conditions with a high level of dynamism. This enables the individual areas of the road surface to be illuminated in a very specific manner. . . .
>
> When the camera system recognises either oncoming traffic or road users driving ahead, the appropriate pixels are automatically deactivated, with the result that a dark tunnel is formed in the pattern of light distribution. The entire scope of light distribution is recalculated by the headlamp control units every 10 ms. In this way other road users are not dazzled but the driver can continue on his journey still using the high beam.
>
> The multi-function camera placed on the wind-screen, which is also used for other driver assistance systems, records the surroundings and the traffic situation. The camera then sends this information to four electronic control units, which calculate the ideal light pattern 100 times per second.

47. Claim 1 then requires, "a multiplicity of independently controllable light sources, including at least two light sources of directional light output, such that each said source substantially illuminates a different sub-area within the area to be lit, the light sources having at least one of controllable light intensity and spectral light distribution. . . ." On information and belief, the Multi-Row Headlamp system has a multiplicity of independently controllable light sources, those being the independently controllable LEDs. Further, on information and belief, the Multi-Row Headlamp system includes at least two of those LED light sources arranged to provide directional light output, such that each of those LED light sources substantially illuminates a different sub-area within the area to be lit, the light sources having at least one of controllable light intensity and spectral light distribution. . . ." This is evidenced, for example by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M5 provides the language quoted in the preceding paragraph of this complaint.

48. Claim 1 further requires, "a controller for adjusting at least one of a light intensity and light spectrum of the light sources. . . ." On information and belief, the Multi-Row Headlamp system has a controller for adjusting at least the light intensity of the LED light sources. This is

evidenced, for example, by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M3 provides the following:

> Each one of these LEDs can be individually electronically controlled. "Gridding" the light in this way allows the light distribution from the right and left headlamps to be controlled entirely separately and adapted to the traffic conditions with a high level of dynamism. This enables the individual areas of the road surface to be illuminated in a very specific manner. . . .
>
> > A camera on the windscreen supplies the system with the information it needs about the constantly changing traffic situation and is also used by other assistance functions. Four control units per vehicle calculate the ideal light pattern 100 times per second and activate all 84 high-performance LEDs in each precision grid module individually.

49. Claim 1 further requires "one or more detectors for sensing at least one of objects, surfaces and beings within the area to be lit including the specific sub-area location information and of passing the sensed information to the controller. . . ." On information and belief, the Multi-Row Headlamp system includes at least a camera detector for sensing traffic and other road users within the area to be lit, including specific sub-area location information, and passes that information to a controller. This is evidenced, for example by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M3 provides the following:

> Each one of these LEDs can be individually electronically controlled. Gridding" the light in this way allows the light distribution from the right and left headlamps to be controlled entirely separately and adapted to the traffic conditions with a high level of dynamism. This enables the individual areas of the road surface to be illuminated in a very specific manner. . . .
>
> When the camera system recognises either oncoming traffic or road users driving ahead, the appropriate pixels are automatically deactivated, with the result that a dark tunnel is formed in the pattern of light distribution. The entire scope of light distribution is recalculated by the headlamp control units every 10 ms. In this way other road users are not dazzled but the driver can continue on his journey still using the high beam.

> The multi- function camera placed on the wind- screen, which is also used for other driver assistance systems, records the surroundings and the traffic situation. The camera then sends this information to four electronic control units, which calculate the ideal light pattern 100 times per second.

Further, Exhibit M1 provides that "the camera forwards the angular positions of other road users to the headlamp, which then sections out the light in this area."

50. Claim 1 ends by requiring "a processor for processing the sensed information and determining illumination requirements of the at least one of objects, surfaces and beings using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables and for directing the controller to adjust the light source for that sub-area to meet the specific illumination requirement." On information and belief, the Multi-Row Headlamp system includes a processor that processes the sensed information for determining the illumination requirements of an object (such as another vehicle), surface, or being using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables and for directing the controller to adjust the light source for that sub-area to meet a specific illumination requirement. This is evidenced, for example by the sources attached as Exhibits M1-M6.

51. This infringement of the '551 patent has caused damage to Torchlight, and Torchlight is entitled to recover damages sustained as a result of the infringement.

## V. COUNT II – INFRINGEMENT OF THE '503 PATENT BY DAIMLER AG AND MERCEDES BENZ USA

52. Torchlight preceding paragraphs as though set forth fully herein.

53. Daimler AG and Mercedes-Benz USA (collectively "Daimler/Mercedes") have infringed one or more claims of the '503 patent in violation of 35 U.S.C. § 271(a) by making,

using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

54. Such infringement is described below based on publicly available information with respect to example claim 59 as to the example Daimler/Mercedes Multi-Row Headlamp system having 84 separately controllable LEDs ("Multi-Row Headlamp system"). On information and belief, Daimler/Mercedes has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

55. The preamble of Claim 59 refers to "A vehicle headlight system. . . ." Daimler/Mercedes vehicles equipped with the Multi-Row Headlamp system include a vehicle headlight system. This is evidenced, for example, by the sources attached as Exhibits M1-M6.

56. Claim 59 then requires "one or more headlamps affixed to a first vehicle, each headlamp including at least three directional light sources having different aimings relative to the first vehicle. . . ." On information and belief, the Multi-Row Headlamp system includes headlamps affixed to a vehicle with each headlamp including at least three light sources, such as three or more of the 84 LEDs, the light from which is aimed at different angles relative to the vehicle such that, for example, light sources including one or more LEDs whose lights would otherwise shine directly on an oncoming car and potentially dazzle its driver can be turned off while the rest of the LEDs continue to illuminate the surrounding areas. This is evidenced, for example by the sources attached as Exhibits M1-M6.

57. Claim 59 then requires "the light sources having one or more controllable illumination characteristics. . . ." On information and belief, Multi-Row Headlamp system LED light sources can be dimmed or turned off so as to control the illumination characteristics of the

light sources. This is evidenced, for example by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M3 provides the following:

> [T]he next generation on the new E-Class uses a newly developed, high-resolution precision LED module as a grid light source, fitted with 84 high-performance LED chips. . . .
>
> Each one of these LEDs can be individually electronically controlled. "Gridding" the light in this way allows the light distribution from the right and left headlamps to be controlled entirely separately and adapted to the traffic conditions with a high level of dynamism. This enables the individual areas of the road surface to be illuminated in a very specific manner. . . .
>
> When the camera system recognises either oncoming traffic or road users driving ahead, the appropriate pixels are automatically deactivated, with the result that a dark tunnel is formed in the pattern of light distribution. The entire scope of light distribution is recalculated by the headlamp control units every 10 ms. In this way other road users are not dazzled but the driver can continue on his journey still using the high beam.

58. Claim 59 then requires "one or more sensors configured to sense information, at least a portion of the sensed information indicating a second vehicle, and communicate sensor data reflecting the sensed information to at least one processor. . . ." On information and belief, the Multi-Row Headlamp system includes at least a camera sensor configured to sense information indicating a second vehicle and to communicate that information to at least one processor. This is evidenced, for example by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M3 provides the following:

> Each one of these LEDs can be individually electronically controlled. Gridding" the light in this way allows the light distribution from the right and left headlamps to be controlled entirely separately and adapted to the traffic conditions with a high level of dynamism. This enables the individual areas of the road surface to be illuminated in a very specific manner. . . .
>
> When the camera system recognises either oncoming traffic or road users driving ahead, the appropriate pixels are automatically deactivated, with the result that a dark tunnel is formed in the pattern of light distribution. The entire scope of light distribution is recalculated by the headlamp control units every 10 ms. In this way

> other road users are not dazzled but the driver can continue on his journey still using the high beam.
>
> The multi- function camera placed on the wind- screen, which is also used for other driver assistance systems, records the surroundings and the traffic situation. The camera then sends this information to four electronic control units, which calculate the ideal light pattern 100 times per second.

59. Claim 59 then requires "wherein the at least one processor is configured to: process the sensor data to identify a first subsection, of a field of view, that includes at least a portion of the second vehicle; determine light output for the headlight system that aims illumination at the first subsection, the illumination aimed at the first subsection substantially resulting in light below a first predefined illuminance in the first subsection, and that aims illumination at one or more second subsections of the field of view to either side of the first subsection, the illumination aimed at the one or more second subsections substantially resulting in light above the first predefined illuminance in the one or more second subsections; and instruct adjustment of one or more of the light sources to achieve the determined output." On information and belief, the Multi-Row Headlamp system includes at least one processor configured to process the sensor data to identify a first subsection of a field of view that includes at least a portion of the second vehicle and to determine and instruct a light output such that illumination aimed at the first subsection results in light below a first predefined illuminance, and that aims illumination to either side of the first subsection resulting in light above the first predefined illuminance. This is evidenced, for example by the sources attached as Exhibits M1-M6. More specifically for example, Exhibit M3 provides the following:

> [T]he next generation on the new E-Class uses a newly developed, high-resolution precision LED module as a grid light source, fitted with 84 high-performance LED chips. . . .

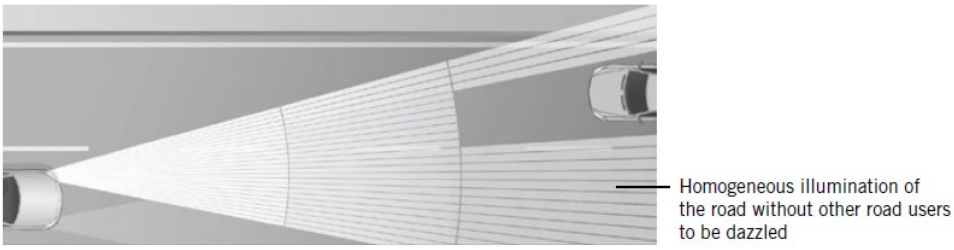
Each one of these LEDs can be individually electronically controlled. "Gridding" the light in this way allows the light distribution from the right and left headlamps to be controlled entirely separately and adapted to the traffic conditions with a high level of dynamism. This enables the individual areas of the road surface to be illuminated in a very specific manner. . . .

When the camera system recognises either oncoming traffic or road users driving ahead, the appropriate pixels are automatically deactivated, with the result that a dark tunnel is formed in the pattern of light distribution. The entire scope of light distribution is recalculated by the headlamp control units every 10 ms. In this way other road users are not dazzled but the driver can continue on his journey still using the high beam.

As another example, Exhibit M2 provides and illustrates the following:

[T]here is the long-range module (precision LED grid module). . . . The light distribution of this module is divided up into 84 separate controllable segments (pixels) arranged in three rows. . . .

The multi- function camera . . . records the surroundings and the traffic situation. The camera then sends this information to four electronic control units, which calculate the ideal light pattern 100 times per second.




60. This infringement of the ’503 patent has caused damage to Torchlight, and Torchlight is entitled to recover the damages sustained as a result of the infringement.

## VI. COUNT III – INFRINGEMENT OF THE ‘029 PATENT BY DAIMLER AG AND MERCEDES-BENZ USA

61. Torchlight realleges the preceding paragraphs as though set forth fully herein.

62. Daimler AG and Mercedes-Benz USA (collectively “Daimler/Mercedes”) have infringed one or more claims of the ‘029 patent in violation of 35 U.S.C. § 271(a) by making,

using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

63. Such infringement is described below based on publicly available information with respect to exemplary claim 1 as to the Mercedes Multibeam system having 84 separate controllable segments (pixels) arranged in three rows ("Mercedes Multibeam system"). On information and belief, Daimler/Mercedes has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

64. The preamble of Claim 1 refers to "A system, for a motor vehicle. . . ." The Mercedes Multibeam system is a system for a motor vehicle. This is evidenced, for example by at least the source attached as Exhibits M1-M6.

65. Claim 1 then requires, "a plurality of headlamps, each comprising a plurality of LED light sources. . . ." On information and belief, the Mercedes Multibeam system includes at least two headlamps, each comprising a number of LED light sources. This is evidenced, for example by at least the sources attached as Exhibits M1-M6.

66. Claim 1 further requires "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 . . . ." On information and belief, the Mercedes

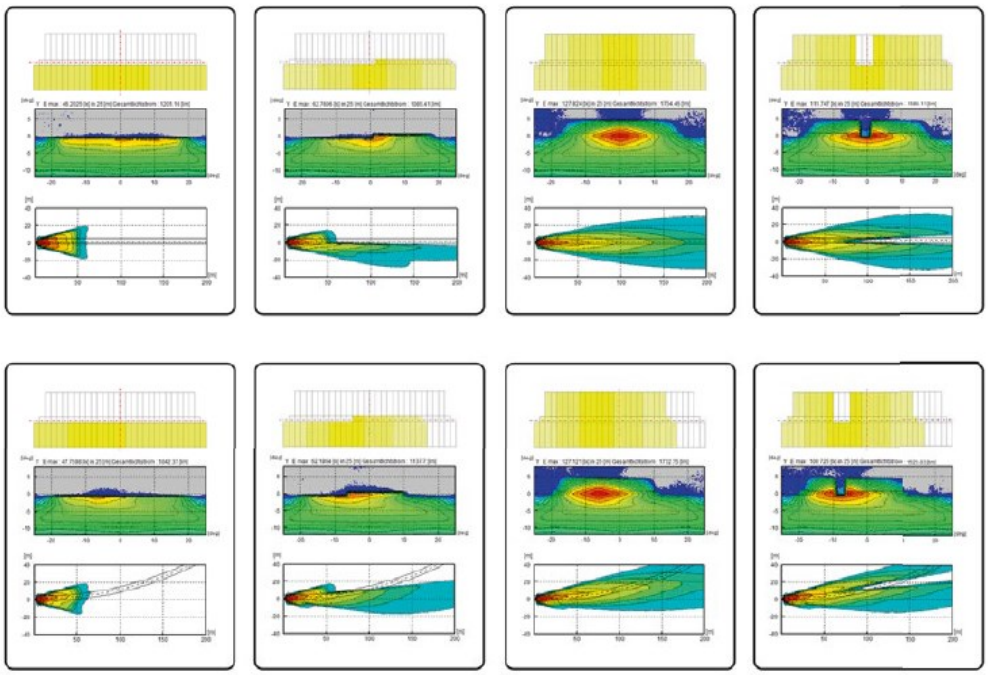
Multibeam system includes one or more control units having one or more processors and a memory storing instructions. The instructions enable the one or more processors to receive first data, including navigation system data, *i.e.*, map data, indicating an upcoming road curve, such as a roundabout. The instructions enable to processor to determine and execute a light change of at least intensity or spatial distribution so as to brighten parts of road lying around a coming curve before the driver arrives there. More specifically for example, This is evidenced, for example by at least the sources attached as Exhibits M1, M2, and M4, M6 and at https://www.youtube.com/watch?v=Zur2KcBOUf4. More specifically, for example, Exhibit M2 provides and illustrates the following:

> The new Multibeam LED headlamp allows a virtually infinite number of light distribution combinations, **FIGURE 5**. The following information describes scenarios for . . . driving in a 300-m bend which can only be brought about by variable control of the individual LEDs. The implementation of mechanically operated parts like actuator units is not necessary. . . .
>
> ***
>
> In addition to its use in the already familiar roundabout light function, data from the navigation system can also be used in the new headlamps of the E-Class in order to detect junctions and motorways in advance. And, consequently, light distribution is automatically adapted to suit such situations as they arise.
>
> The newly developed precision LED grid module enables all the various light distributions described before to be swivelled into position virtually (without actuator units), also those in the low beam range. Here, by means of variable dimming of individual pixels adapted to suit each situation, the light focus in the particular setting is shifted so that the driver's attention is directed towards the bend. Such dynamic bend lighting that is implemented purely by electronics is a world premiere.
>
> ***
>
> As well as the visual information provided by the camera, data from the navigation system is also used for these calculations. Thus particular driving scenarios, such as those created by roundabouts, junctions or motorways, can be recognised in advance and the relevant light distribution then automatically adapted to suit.

**FIGURE 5** Lighting function examples of the Multi-beam LED headlamp – scenarios which can only be brought about by variable control of the individual LEDs (© Hella)

Driving straight ahead

Driving in bends 300 m radius



67. This infringement of the ’029 patent has caused damage to Torchlight, and Torchlight is entitled to recover the damages sustained as a result of the infringement.

## VII. COUNT IV -- INFRINGEMENT OF THE ‘551 PATENT BY VW AG, VW AMERICA, AUDI AG, AND AUDI AMERICA

68. Torchlight realleges the preceding paragraphs as though set forth fully herein.

69. VW AG, VW America, Audi AG, and Audi America (collectively “VW/Audi”) have infringed one or more claims of the ’551 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

70. Such infringement is described below based on publicly available information with respect to example claim 1 as to the example Audi Matrix system having 25 separately controllable LEDs (referred to herein as the “Audi Matrix system”). On information and belief, VW/Audi has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

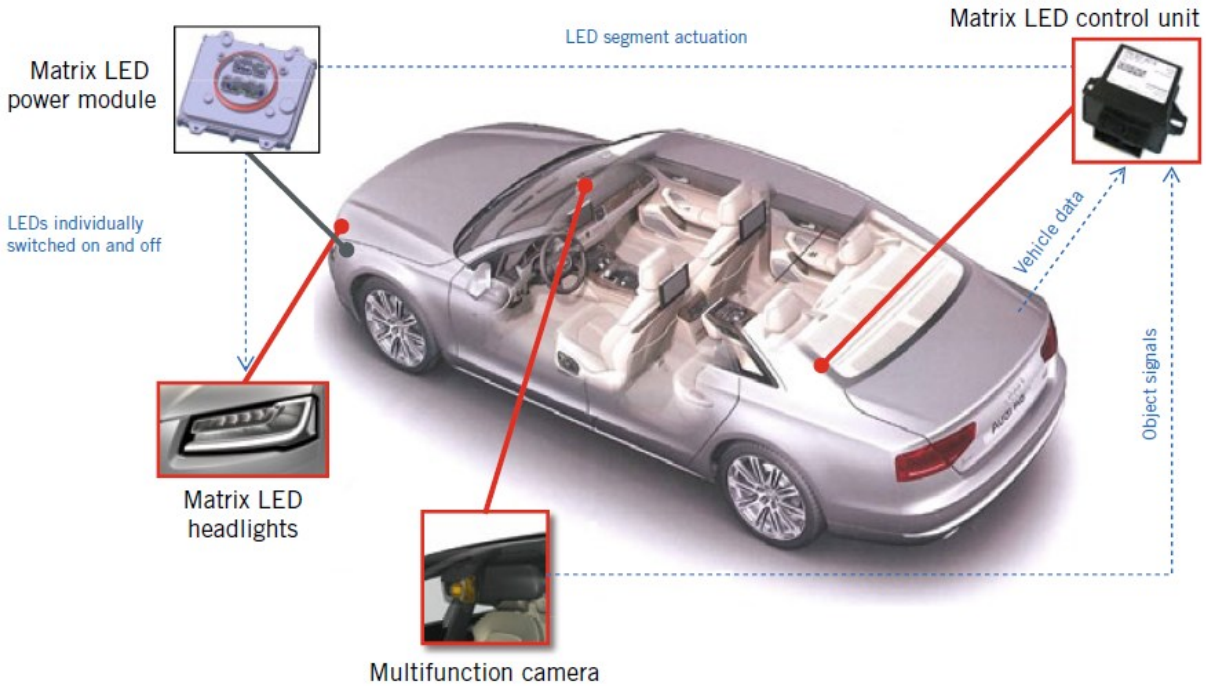
71. The preamble of Claim 1 refers to a device "for illuminating an area to be lit capable of automatically meeting specific illumination requirements of different sub-areas within the area to be lit. . . ." On information and belief, VW/Audi vehicles equipped with the Audi Matrix system include a device for illuminating an area to be lit and the system automatically meets the specific illumination requirements of different sub-areas within the area to be lit. This is evidenced, for example by the sources attached as Exhibits A1-A4. More specifically for example, Exhibit A1 provides the following:

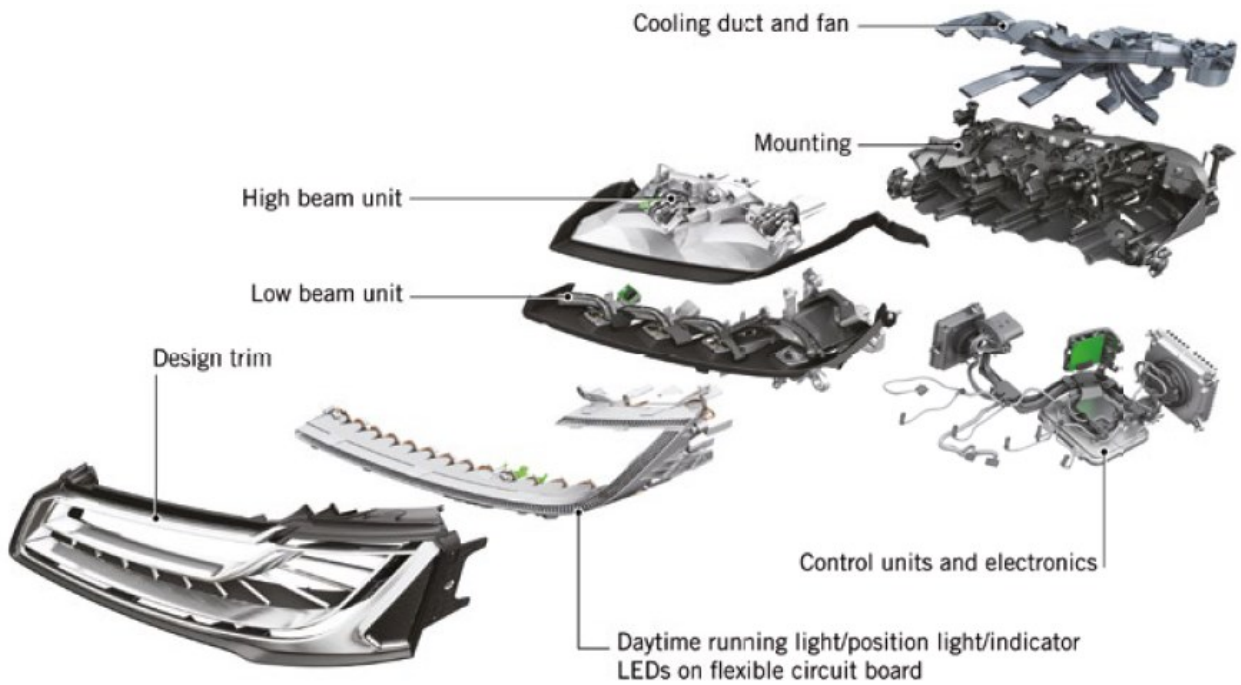
> Each of the matrix LED headlights in the new top-class sedan Audi A8 houses 25 main beam light-emitting diodes which can be individually dimmed according to the situation. As soon as the camera registers a vehicle, either oncoming or driving in front, the light that would shine on them is blinded out. All other areas in between and to the sides remain fully illuminated by the main beam headlights.

72. Claim 1 then requires "a multiplicity of independently controllable light sources, including at least two light sources of directional light output, such that each said source substantially illuminates a different sub-area within the area to be lit, the light sources having at least one of controllable light intensity and spectral light distribution. . . ." On information and belief, the Audi Matrix system has a multiplicity of independently controllable light sources, those being the 25 independently controllable LEDs. Further, on information and belief, the Audi Matrix system includes at least two of those LED light sources arranged to provide directional light output, such that each of those LED light sources substantially illuminates a different sub-area within the area to be lit, the light sources having at least one of controllable light intensity and spectral light distribution. . . ." This is evidenced, for example, by the sources attached as Exhibits A1-A4, and also https://www.autoevolution.com/news/real-world-test-audi-a8-s8-matrix-led-on-highway-video-87709.html.

73. Claim 1 further requires "a controller for adjusting at least one of a light intensity and light spectrum of the light sources. . . ." On information and belief, the Audi Matrix system has a controller for adjusting at least the light intensity of the LED light sources. This is evidenced, for example by the sources attached as Exhibits A1, A2, and A4. Exhibit A1, for example, provides and shows the following:

> The overall system . . . comprises three main components:
> : the matrix LED headlights with the matrix LED power module
> : the multifunction camera
> : the matrix LED control unit as the "brain" of the system.
>
> The camera system for detecting other road users is accommodated behind the windscreen in the base of the mirror. If this camera detects another road user ahead, this will be registered by the image processor and classified as a relevant object. The camera uses an object list to tell the control unit where the other road users are. This list essentially contains the distances in the form of distance classes and the vertical and horizontal angles to the object. The image processor is integrated into the camera, allowing object lists with the necessary characteristics to be made directly available to other vehicle systems. . . .
>
> The function software in the control unit acts as a link between the camera (as the sensor) and the headlight (as the actuator in the overall system). It performs the alignment between the objects in the camera and the matrix LED segments. The camera supplies the function software with the angle coordinates of the other road users in the camera coordinates system relative to the dynamic driving axis. The function software features a data record which contains the position of every single matrix LED segment in the headlight coordinates system relative to the dynamic driving axis. The origin of the headlight coordinates system is in the headlight – in the geometrical centre of the matrix LED optics. The control unit computes which matrix LED segments are dimmed in the fi elds in which the other road users are located. The LEDs in the segments concerned are deactivated to prevent glare.
>
> ***
>
> The camera sensors detect road users who are to be shielded from glare, and transmit the position of such objects to the actuation electronics. The actuation electronics compare the transmitted position of the detected objects with the light segment. They then switch the LEDs off, or selectively dim them, in the light segments in which there are objects which would be exposed to glare. The remaining main beam light segments remain available to the driver, enhancing his view without dazzling other road users

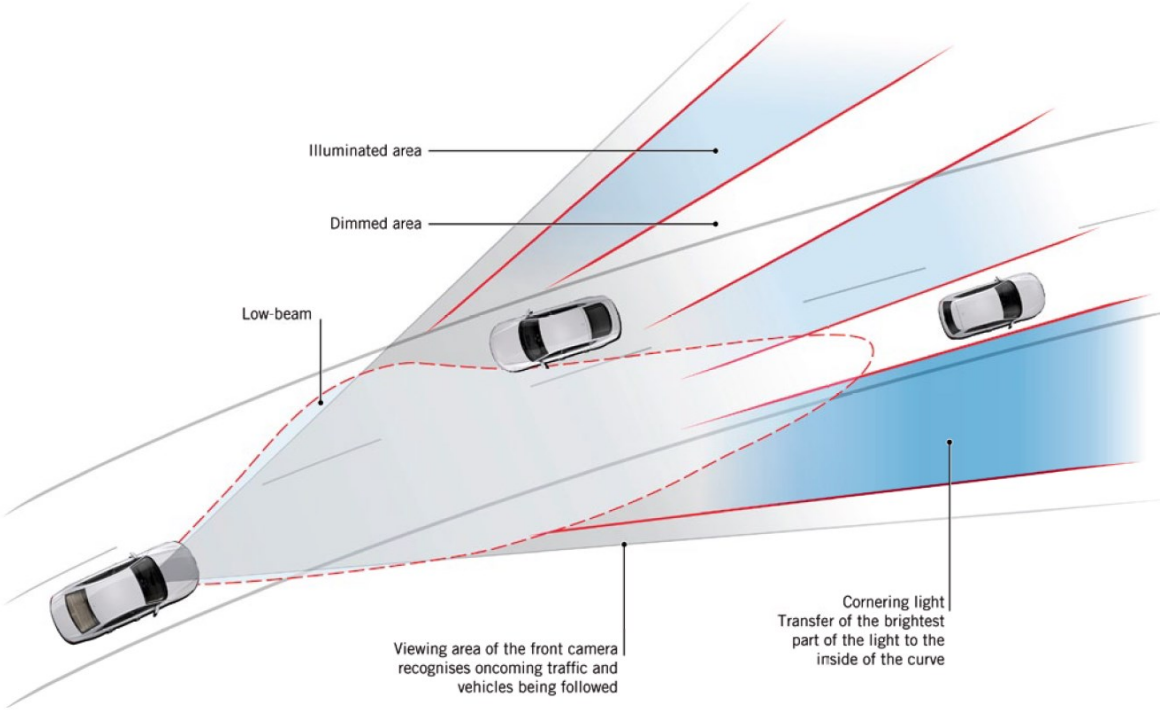



74. Claim 1 further requires "one or more detectors for sensing at least one of objects, surfaces and beings within the area to be lit including the specific sub-area location information and of passing the sensed information to the controller. . . ." On information and belief, the Audi Matrix system includes at least a camera detector for sensing traffic and other road users within

the area to be lit, including specific sub-area location information, and passes that information to a controller. This is evidenced, for example by the sources attached as Exhibits A1-A4. More specifically for example, Exhibit A1 is quoted in the preceding paragraph of this complaint.

75. Claim 1 ends by requiring "a processor for processing the sensed information and determining illumination requirements of the at least one of objects, surfaces and beings using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables and for directing the controller to adjust the light source for that sub-area to meet the specific illumination requirement." On information and belief, the Audi Matrix system includes a processor that processes the sensed information for determining the illumination requirements of an object (such as another vehicle), surface, or being using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables and for directing the controller to adjust the light source for that sub-area to meet a specific illumination requirement. This is evidenced, for example by the sources attached as Exhibits A1 and A4, and also https://www.autoevolution.com/news/real-world-test-audi-a8-s8-matrix-led-on-highway-video-87709.html. Exhibit A1 shows such illumination as follows:




76. This infringement of the ’551 patent has caused damage to Torchlight, and Torchlight is entitled to recover damage sustained as a result of the infringement.

## VIII. COUNT V – INFRINGEMENT OF THE ‘503 PATENT BY VW AG, VW AMERICA, AUDI AG AND AUDI AMERICA

77. Torchlight realleges the preceding paragraphs as though set forth fully herein.

78. VW AG, VW America, Audi AG, and Audi America (collectively “VW/Audi”) have infringed one or more claims of the ’503 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

79. Such infringement is described below based on publicly available information with respect to example claim 59 as to the example Audi Matrix system having 25 separately controllable LEDs (“Audi Matrix system”). On information and belief, VW/Audi has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

80. The preamble of Claim 59 refers to "A vehicle headlight system. . . ." VW/Audi vehicles equipped with the Audi system include a vehicle headlight system. This is evidenced, for example by at least the sources attached as Exhibit A1-A4.

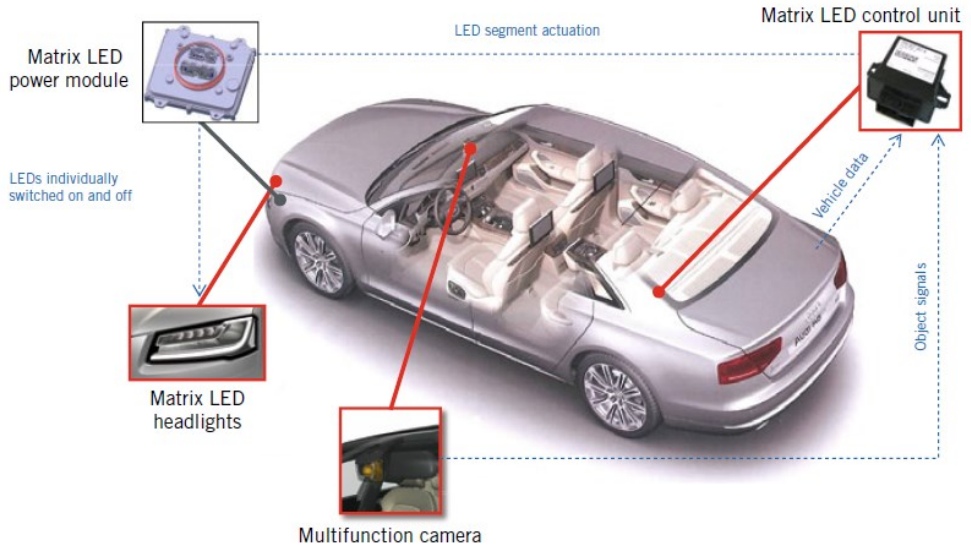
81. Claim 59 then requires, "one or more headlamps affixed to a first vehicle, each headlamp including at least three directional light sources having different aimings relative to the first vehicle. . . ." On information and belief, the Audi Matrix system includes headlamps affixed to a vehicle with each headlamp including at least three light sources, such as three or more of the 25 LEDs, the light from which is aimed at different angles relative to the vehicle such that, for example, light sources including one or more LEDs whose lights would otherwise shine directly on an oncoming car and potentially glare its driver can be turned off while the rest of the LEDs continue to illuminate the surrounding areas. This is evidenced, for example by at least the sources attached as Exhibits A1-A4.

82. Claim 59 further requires "the light sources having one or more controllable illumination characteristics. . . ." On information and belief, the Audi Matrix system includes light sources including one or more LEDs that can be controllably switched on or off or that can be dimmed so as to control the illumination characteristics of the light sources. This is evidenced, for example by at least the sources attached as Exhibits A1-A4.

83. Claim 59 further requires "one or more sensors configured to sense information, at least a portion of the sensed information indicating a second vehicle, and communicate sensor data reflecting the sensed information to at least one processor. . . ." On information and belief, the Audi Matrix system includes at least a camera sensor configured to sense information indicating a second vehicle and to communicate that information to at least one processor. This is evidenced,

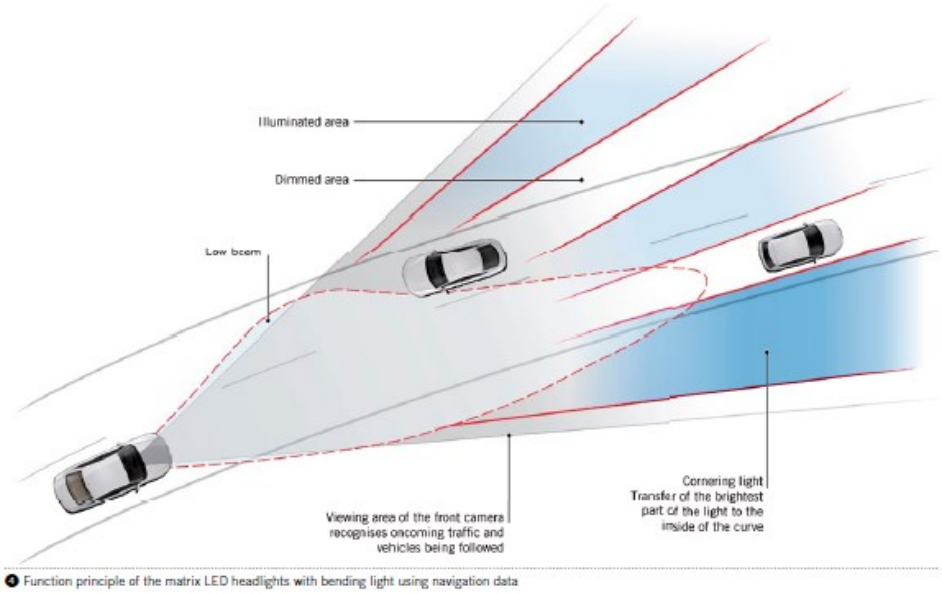
for example by the sources attached as Exhibits A1-A4. More specifically for example, Exhibit A1 provides and shows the following:

> The overall system,, comprises three main components:
> : the matrix LED headlights with the matrix LED power module
> : the multifunction camera
> : the matrix LED control unit as the "brain" of the system.
>
> The camera system for detecting other road users is accommodated behind the windscreen in the base of the mirror. If this camera detects another road user ahead, this will be registered by the image processor and classified as a relevant object. The camera uses an object list to tell the control unit where the other road users are. This list essentially contains the distances in the form of distance classes and the vertical and horizontal angles to the object. The image processor is integrated into the camera, allowing object lists with the necessary characteristics to be made directly available to other vehicle systems. Modern day multifunction cameras perform a wide range of different functions such as Audi lane assist and traffic sign recognition. The vehicle camera and headlights are calibrated to each other during the production process.
>
> The function software in the control unit acts as a link between the camera (as the sensor) and the headlight (as the actuator in the overall system). It performs the alignment between the objects in the camera and the matrix LED segments. The camera supplies the function software with the angle coordinates of the other road users in the camera coordinates system relative to the dynamic packs of five in five reflectors. Each LED chip generates a main beam segment in the form of a vertical strip.




❷ Linking three main components to an overall system

84. Claim 59 further requires "wherein the at least one processor is configured to: process the sensor data to identify a first subsection, of a field of view, that includes at least a portion of the second vehicle; determine light output for the headlight system that aims illumination at the first subsection, the illumination aimed at the first subsection substantially resulting in light below a first predefined illuminance in the first subsection, and that aims illumination at one or more second subsections of the field of view to either side of the first subsection, the illumination aimed at the one or more second subsections substantially resulting in light above the first predefined illuminance in the one or more second subsections; and instruct adjustment of one or more of the light sources to achieve the determined output." On information and belief, the Audi Matrix system includes at least one processor configured to process the sensor data to identify a first subsection of a field of view that includes at least a portion of the second vehicle and to determine and instruct a light output such that illumination aimed at the first subsection results in light below a first predefined illuminance, and that aims illumination to either side of the first subsection resulting in light above the first predefined illuminance. This is evidenced, for example by at least the sources attached as Exhibits A1-A4. More specifically for example, see Exhibit A1 quoted in the preceding paragraph of this complaint. Exhibit A1 illustrates the illumination as follows:



Function principle of the matrix LED headlights with bending light using navigation data

85. This infringement of the ’503 patent has caused damage to Torchlight, and Torchlight is entitled to recover damages sustained as a result of the infringement.

## IX. COUNT VI – INFRINGEMENT OF THE ‘029 PATENT BY VW AG, VW AMERICA, AUD AG, AND AUDI AMERICA

86. Torchlight realleges the preceding paragraphs as though set forth fully herein.

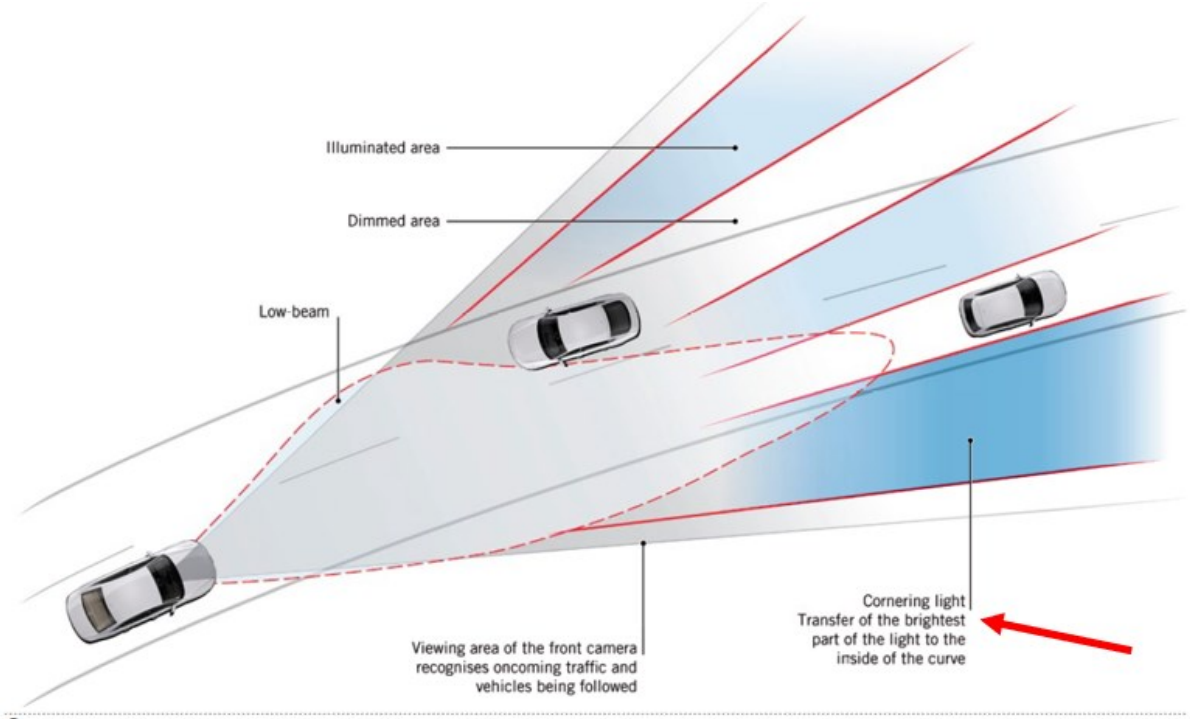
87. VW AG, VW America, Audi AG, and Audi America Audi have infringed one or more claims of the ‘029 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

88. Such infringement is described below based on publicly available information with respect to example claim 1 as to the example Audi Matrix system having 25 separately controllable LEDs (“Audi Matrix system”). On information and belief, VW/Audi has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

89. The preamble of Claim 1 refers to "A system, for a motor vehicle. . . ." The Audi Matrix system is system for a motor vehicle. This is evidenced, for example by at least the sources attached as Exhibit A1-A4.

90. Claim 1 then requires, "a plurality of headlamps, each comprising a plurality of LED light sources. . . ." On information and belief, the Audi Matrix system includes at least two headlamps, each comprising a number of LED light sources. This is evidenced, for example by at least the sources attached as Exhibits A1-A4.

91. Claim 1 further requires "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 . . . ." On information and belief, the Audi Matrix system includes one or more control units having one or more processors and a memory storing instructions. The instructions enable the one or more processors to receive first data, including navigation system data, i.e., map data, indicating an upcoming road curve. The instructions enable to processor to determine a light change of at least intensity or spatial distribution so as to brighten parts of road lying around a coming curve before the driver arrives there. This is evidenced, for example by at least the sources attached as Exhibits A1 (in addition to text, see illustration excerpted and reproduced below), A2, A3, and A4.




4 Function principle of the matrix LED headlights with bending light using navigation data

92. This infringement of the ’029 patent has caused damage to Torchlight, and Torchlight is entitled to recover damages sustained as a result of the infringement.

## X. COUNT VII – INFRINGEMENT OF THE ‘551 PATENT BY VW AG, PORSCH AG, AND PORSCHE AMERICA

93. Torchlight realleges the preceding paragraphs as though set forth fully herein.

94. VW AG, VW America, Porsche AG, and Porsche America (collectively “VW/Porsche”) have infringed one or more claims of the ’551 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

95. Such infringement is described below based on publicly available information with respect to example claim 1 as to the example Porsche Matrix system having 84 separately

controllable LEDs (referred to herein as the "Porsche Matrix system"). On information and belief, VW/Porsche has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

96. The preamble of Claim 1 refers to a device "for illuminating an area to be lit capable of automatically meeting specific illumination requirements of different sub-areas within the area to be lit. . . ." On information and belief, VW/Porsche vehicles equipped with the Porsche Matrix system include a device for illuminating an area to be lit and the system automatically meets the specific illumination requirements of different sub-areas within the area to be lit. This is evidenced, for example by the sources attached as Exhibits P1-P3. More specifically, for example, Exhibit P1provides the following:

> The matrix beam strategically deactivates specific segments of the permanent main-beam cone. Eighty-four individually controlled LEDs adapt to the situation ahead by switching off or dimming accordingly. Vehicles in front or in the oncoming lane are no longer dazzled, while the areas in between and to the side continue to receive full illumination. To optimise target fixation, not only are the lights selectively dimmed to fade out oncoming vehicles, the area to the right of the light void is lit more brightly for better guidance of the driver's visual attention. What's more, segment-specific dimming of highly reflective traffic signs also acts to avoid driver dazzle. LED main headlights with matrix beam including PDLS Plus: bright, homogeneous, safe.

97. Claim 1 then requires "a multiplicity of independently controllable light sources, including at least two light sources of directional light output, such that each said source substantially illuminates a different sub-area within the area to be lit, the light sources having at least one of controllable light intensity and spectral light distribution. . . ." On information and belief, the Porsche Matrix system has a multiplicity of independently controllable light sources, those being the 84 independently controllable LEDs. Further, on information and belief, the Multi-Row Headlamp system includes at least two of those LED light sources arranged to provide

directional light output, such that each of those LED light sources substantially illuminates a different sub-area within the area to be lit, the light sources having at least one of controllable light intensity and spectral light distribution. . . ." This is evidenced, for example by the sources attached as Exhibits P1-P3. More specifically for example, Exhibit P1 provides the language quoted in the preceding paragraph of this complaint.

98. Claim 1 further requires "a controller for adjusting at least one of a light intensity and light spectrum of the light sources. . . ." On information and belief, the Porsche Matrix system has a controller for adjusting at least the light intensity of the LED light sources. This is evidenced, for example, by the sources attached as Exhibits P1-P3. More specifically, for example, Exhibit P2 provides the following:

> The brightness of each individual diode is electronically controlled. If the camera on the rearview mirror detects an oncoming car or one up ahead, the control unit switches off the LED units that could blind those drivers.
>
> The control unit for the matrix LED headlights always takes into account the human factor, explains Dr. Sebastian Söhner, who is in charge of automatic headlight settings. "Drivers' eyes are drawn to the brightest point in their field of vision, which is generally the headlights of an oncoming car. That can prevent them from seeing what is happening in places like the edges of their own lane. So matrix LED headlights not only suppress their glare for other drivers but also increase the intensity of light to the sides—for example toward the lane divider—in order to provide visual support for remaining on course." The boost in power for the LEDs directed at the edges of the lane comes from the diodes that have been switched off.

99. Claim 1 further requires "one or more detectors for sensing at least one of objects, surfaces and beings within the area to be lit including the specific sub-area location information and of passing the sensed information to the controller. . . ." On information and belief, the Porsche Matrix system includes at least a camera detector for sensing traffic and other road users within the area to be lit, including specific sub-area location information, and passes that information to

a controller. This is evidenced, for example by the sources attached as Exhibits P1-P3. More specifically for example, see Exhibit P2 quoted in the preceding paragraph of this complaint.

100. Claim 1 ends by requiring "a processor for processing the sensed information and determining illumination requirements of the at least one of objects, surfaces and beings using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables and for directing the controller to adjust the light source for that sub-area to meet the specific illumination requirement." On information and belief, the Porsche Matrix system includes a processor that processes the sensed information for determining the illumination requirements of an object (such as another vehicle), surface, or being using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables and for directing the controller to adjust the light source for that sub-area to meet a specific illumination requirement. This is evidenced, for example by the sources attached as Exhibits P1-P3.

101. This infringement of the '551 patent has caused damage to Torchlight, and Torchlight is entitled to recover damages sustained as a result of the infringement.

## XI. COUNT VIII – INFRINGEMENT OF THE '503 PATENT BY VW AG, PORSCHE AG, AND PORSCHE AMERICA

102. Torchlight realleges the preceding paragraphs as though set forth fully herein.

103. VW AG, VW America, Porsche AG, and Porsche America (collectively "VW/Porsche") have infringed one or more claims of the '503 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

104. Such infringement is described below based on publicly available information with respect to example claim 59 as to the example Porsche Matrix system having 84 separately

controllable LEDs ("Porsche Matrix system"). On information and belief, VW/Porsche has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

105. The preamble of Claim 59 refers to "A vehicle headlight system. . . ." VW/Porsche vehicles equipped with the Porsche Matrix system include a vehicle headlight system. This is evidenced, for example by at least the sources attached as Exhibits P1-P3.

106. Claim 59 then requires, "one or more headlamps affixed to a first vehicle, each headlamp including at least three directional light sources having different aimings relative to the first vehicle. . . ." On information and belief, the Porsche Matrix system includes headlamps affixed to a vehicle with each headlamp including at least three light source, each including one or more of the 84 LEDs, the light from which is aimed at different angles relative to the vehicle such that, for example, light sources including one or more LEDs whose lights would otherwise shine directly on an oncoming car and potentially glare its driver can be turned off or dimmed while the rest of the LEDs continue to illuminate the surrounding areas. This is evidenced, for example by at least the sources attached as Exhibits P1-P3.

107. Claim 59 further requires "the light sources having one or more controllable illumination characteristics. . . ." On information and belief, Porsche Matrix system LED light sources can be dimmed or turned off so as to control the illumination characteristics of the light sources. This is evidenced, for example by at least the sources attached as Exhibits P1-P3.

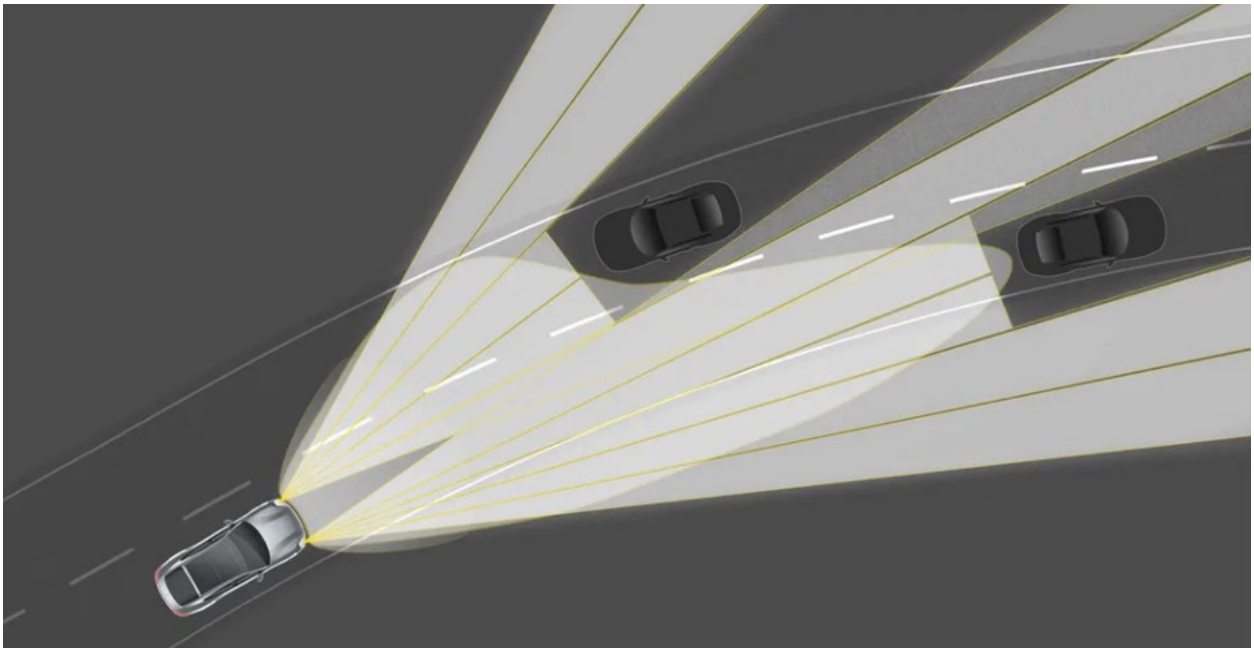
108. Claim 59 further requires "one or more sensors configured to sense information, at least a portion of the sensed information indicating a second vehicle, and communicate sensor data reflecting the sensed information to at least one processor. . . ." On information and belief, the Porsche Matrix system includes at least a camera sensor configured to sense information indicating

a second and to communicate that information to at least one processor. This is evidenced, for example, by the sources attached as Exhibits P1-P3. More specifically, for example, Exhibit P2 provides the following:

> The brightness of each individual diode is electronically controlled. If the camera on the rearview mirror detects an oncoming car or one up ahead, the control unit switches off the LED units that could blind those drivers.
>
> The control unit for the matrix LED headlights always takes into account the human factor, explains Dr. Sebastian Söhner, who is in charge of automatic headlight settings. "Drivers' eyes are drawn to the brightest point in their field of vision, which is generally the headlights of an oncoming car. That can prevent them from seeing what is happening in places like the edges of their own lane. So matrix LED headlights not only suppress their glare for other drivers but also increase the intensity of light to the sides—for example toward the lane divider—in order to provide visual support for remaining on course." The boost in power for the LEDs directed at the edges of the lane comes from the diodes that have been switched off. An adaptive thermal management system prevents overheating and extends the service life of the lights.

109. Claim 59 then requires "wherein the at least one processor is configured to: process the sensor data to identify a first subsection, of a field of view, that includes at least a portion of the second vehicle; determine light output for the headlight system that aims illumination at the first subsection, the illumination aimed at the first subsection substantially resulting in light below a first predefined illuminance in the first subsection, and that aims illumination at one or more second subsections of the field of view to either side of the first subsection, the illumination aimed at the one or more second subsections substantially resulting in light above the first predefined illuminance in the one or more second subsections; and instruct adjustment of one or more of the light sources to achieve the determined output." On information and belief, the Porsche Matrix system includes at least one processor configured to process the sensor data to identify a first subsection of a field of view that includes at least a portion of the second vehicle and to determine and instruct a light output such that illumination aimed at the first subsection results in light below

a first predefined illuminance, and that aims illumination to either side of the first subsection resulting in light above the first predefined illuminance. This is evidenced, for example by the sources attached as Exhibits P1-P3. Exhibit P1 illustrates such illumination as follows:



110. This infringement of the ’503 patent has caused damage to Torchlight, and Torchlight is entitled to recover damages sustained as a result of the infringement.

## XII. COUNT IX – INFRINGEMENT OF THE ‘029 PATENT BY VW AG, PORSCHE AG, AND PORSCHE AMERICA

111. Torchlight realleges the preceding paragraphs as though set forth fully herein.

112. VW AG, VW America, Porsche AG, and Porsche America (collectively “VW/Porsche”) have infringed one or more claims of the ‘029 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, certain motor vehicle illuminating devices including multiple light sources.

113. Such infringement is described below based on publicly available information with respect to example claim 1 as to the example Porsche Matrix system having 84 separately controllable LEDs ("Porsche Matrix system"). On information and belief, VW/Porsche has installed these devices in its vehicles and sold the vehicles to or through dealers throughout the U.S.

114. The preamble of Claim 1 refers to "A system, for a motor vehicle. . . ." The Porsche Matrix system is system for a motor vehicle. This is evidenced, for example by at least the sources attached as Exhibits P1-P3.

115. Claim 1 then requires, "a plurality of headlamps, each comprising a plurality of LED light sources. . . ." On information and belief, the Audi Matrix system includes at least two headlamps, each comprising a number of LED light sources. This is evidenced, for example by at least the sources attached as Exhibits P1-P3.

116. Claim 1 further requires "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 . . . ." On information and belief, the Porsche Matrix system includes one or more processors and a memory storing instructions. The instructions enable the one or more processors to receive first data, including navigation system

data, i.e., map data, indicating an upcoming road curve. The instructions enable to processor to determine a light change of at least intensity or spatial distribution so as to increase light in a direction of the road curvature ahead of the motor vehicle and shape light based at least in part on the road curvature increase to light on parts of the road lying around a coming curve prior to the motor vehicle reaching the road curvature. This is evidenced, for example by at least the sources attached as Exhibits P1-P3. More specifically for example, Exhibit P2 provides, "The middle row of 28 forms the synthetic curve light . . . which always adapts to the radius of the curve, shines dynamically to the right or left by switching through the row, so it doesn't need to use a servomotor or settle for a rigid cone of light," while Exhibit P3 provides, "The complex headlight module consists of several components that can be controlled very flexibly, and independently of each other, on the basis of camera data, navigation data and vehicle conditions."

117. This infringement of the '029 patent has caused damage to Torchlight, and Torchlight is entitled to recover damages sustained as a result of the infringement.

## XIII. DEMAND FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that this Court enter judgment against Defendants as follows:

A. Declaring that Defendants have infringed United States Patent Nos. 9,955,551 B2 and C1, United States Patent No. 10,894,503, and U.S. Patent No. 11,208,029 in violation of 35 U.S.C. § 271;

B. Awarding damages to Torchlight arising out of this infringement, including enhanced damages pursuant to 35 U.S.C. § 284 and prejudgment and post-judgment interest;

C. Awarding Torchlight its costs and expenses in this action;

D. Declaring that this case is exceptional, and that Torchlight is entitled to its

reasonable attorneys' fees pursuant to 35 U.S.C. § 285; and

E. Awarding such other and further relief the Court deems just and proper, including any relief that the Court may deem appropriate under 35 U.S.C. § 285.

## XIV. DEMAND FOR JURY TRIAL

Plaintiff, Torchlight, respectfully demands a trial by jury of all issues triable of right by a jury in this action.

Respectfully submitted,

Dated: August 26, 2022

*/s/ Kenneth L. Dorsney*

Kenneth L. Dorsney (#3726)
Cortlan S. Hitch (#6720)
MORRIS JAMES LLP
500 Delaware Avenue, Suite 1500
Wilmington, DE 19801
(302) 888-6800
kdorsney@morrisjames.com
chitch@morrisjames.com

*Attorneys for Plaintiff*

OF COUNSEL:

**BROOKS KUSHMAN P.C.**
John Halan
1000 Town Center, Twenty-Second Floor
Southfield, Michigan 48075
Tel. (248) 358-4400/ Fax: (248) 358-3351
Email: jhalan@brookskushman.com
tlewry@brookskushman.com
sshah@brookskushman.com
resfahani@brookskushman.com