IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

Carrum Technologies, LLC Plaintiff, v. FCA US LLC, Defendant.	C.A. No. _____ **DEMAND FOR JURY TRIAL**

COMPLAINT

Plaintiff Carrum Technologies, LLC ("Carrum") hereby asserts the following claims for patent infringement against Fiat Chrysler Automobiles' U.S.-based subsidiary, FCA US LLC ("FCA").

NATURE OF THE ACTION

1. This is an action for infringement of U.S. Patent Nos. 7,512,475 and 7,925,416 (collectively, "the Asserted Patents").

2. This action arises under the Patent Laws of the United States, 35 U.S.C. § 1 et seq.

PARTIES

3. Plaintiff Carrum is a limited liability company organized under the laws of this state, with its principal place of business at 221 River Street Floor 9, Hoboken, NJ 07030.

4. Defendant FCA is a limited liability company organized under the laws of this state, with its principal place of business at 1000 Chrysler Drive, Auburn Hills, Michigan 48326.

JURISDICTION AND VENUE

5. This action arises under the patent laws of the United States of America. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a).

6. This Court has personal jurisdiction over FCA because FCA is a corporation incorporated in this state. In addition, on information and belief, FCA routinely engages in the marketing and sale in Delaware of its products that infringe the Asserted Patents.

7. Venue is proper in this judicial district under 28 U.S.C. §§ 1391(b) and (c), and 1400(b) for at least the reasons set forth above.

BACKGROUND

8. Adaptive cruise control (also known as "ACC") is an increasingly common feature on newer vehicles and represents a significant advance in cruise control technology. ACC allows the vehicle to maintain a set speed when appropriate, while automatically reducing the speed when traffic conditions make the set speed unsafe. The Asserted Patents address a critical deficiency in previous iterations of ACC technology, namely, the ability of ACC systems to operate safely and comfortably in a curve.

9. In basic cruise control systems, the driver activates cruise control at a desired speed. The vehicle will maintain the set speed indefinitely, even if upcoming traffic or road conditions render the set speed unsafe. If the vehicle is about to encounter slower traffic, or a curve that cannot be safely handled at the cruising speed, the driver must manually disengage the cruise control and apply the brakes. As a result, basic cruise control systems are of limited use to the driver except when the road is straight and lightly trafficked.

10. ACC attempts to overcome these limitations of basic cruise control. It uses sensors to detect cars that are in the path of the host vehicle. If another car is in the same lane as the host vehicle, but traveling at a slower speed, the ACC will detect the obstacle. Then, the ACC will automatically release the throttle and/or apply the brake, to slow down the host vehicle to an appropriate speed. The ACC will then cause the host vehicle to follow behind the target vehicle at a set distance until the target speeds up, at which point the ACC will accelerate the host vehicle and (if appropriate) resume the cruising speed. The most advanced ACC systems can function safely even in highway stop-and-go traffic conditions, without the need for the driver to manually accelerate or brake.

11. However, like basic cruise control, early ACC systems struggled to perform well when the road curves. This was for two basic reasons.

12. First, early ACC systems did not brake as the vehicle entered a curve. If the vehicle entered the curve too fast, the driver and passengers would experience

uncomfortable lateral acceleration (causing the feeling of being jerked to the outside edge of the car as it is turning). In a particularly tight curve, a host vehicle utilizing an early ACC system may lose traction, veer into other lanes, or run off the road altogether. Thus, with early ACC systems, the driver had to determine whether the set speed was too fast for an upcoming curve and, if so, manually brake or disengage the ACC system.

13. Second, in a curve, early ACC systems had difficulty determining whether an object detected by the sensor was in the vehicle's path. On a straight road, if a sensor detects an object directly in front of the host vehicle, the object necessarily presents a potential obstacle. Not so if the road is curved. The object might be a roadside street sign that presents no threat but that appears to be directly in front of the host vehicle as the road curves. Or, the object might be a car or truck in an adjacent lane of traffic, which briefly appears to be in front of the host vehicle due to the curvature of the road. Early ACC systems would incorrectly determine that these objects were within the path of the host vehicle, resulting in unnecessary, uncomfortable, and potentially dangerous braking.

14. Plaintiff Carrum owns the Asserted Patents—U.S. Patent Nos. 7,512,475 (" '475 patent") and 7,925,416 (" '416 patent") —which were designed to solve these

problems. True and correct copies of the '475 patent and the '416 patent are attached to this Complaint as Exhibits 1 and 2, respectively.[1]

15. The Asserted Patents disclose "a system and method for enabling a vehicle having adaptive cruise control to reduce its speed in a turn according to the vehicle's position within the turn as well as ignoring objects detected during the turn that are not in the vehicle's path." Ex. 1, at 1; Ex. 2, at 1. The described ACC system "determin[es] whether the vehicle is in a turn in the vehicle's path by detecting change in the vehicle's lateral acceleration." *Ibid.* Lateral acceleration is the sideways acceleration generated by the centrifugal force acting on the car when it turns. Excessive lateral acceleration can create discomfort or even cause the vehicle to lose control in a curve.

16. Lateral acceleration is a function of the vehicle's speed and the curvature of the road.[2] Thus, if an ACC system knows both the vehicle speed and the rate of change of lateral acceleration, it can better detect when the vehicle is entering a curve and predict the upcoming curvature of the road.

17. For example, assume the vehicle travels on a highway at a constant speed. The vehicle should experience no lateral acceleration when the vehicle is traveling in its lane on a straight highway. If lateral acceleration increases, the ACC system can infer that the vehicle is starting to enter a curve. If lateral acceleration

[1] The '416 patent is based on a divisional application relating to the '475 patent.
[2] Lateral acceleration also depends on the forces of friction between the vehicle's tires and the road.

continues to increase (assuming the vehicle maintains a constant speed), that suggests the curve is tightening further. Eventually, lateral acceleration should reach a peak and then begin to decrease. The point at which lateral acceleration starts to decrease (keeping speed constant) reflects the moment that the curve begins to straighten out.

18. The various claims of the Asserted Patents disclose systems and methods which use lateral acceleration data to improve an ACC system's performance in a curve. For instance, the Asserted Patents disclose methods for using lateral acceleration data to determine that the vehicle is in a turn and/or to predict the vehicle's path within the turn. By combining the lateral acceleration information with other data (for instance, the vehicle's speed or yaw rate), an ACC system can determine whether the vehicle has entered a curve at an excessive speed, and if so, to reduce the speed to a safe and comfortable level. Additionally, the lateral acceleration data allows an ACC system to better predict the host vehicle's path on a curved road, which allows an ACC system to determine whether a detected object falls within or outside of the lane of travel. The Asserted Patents thus solve the twin problems that plagued early ACC systems relating to performance in a curve.

19. FCA offers for sale vehicles that have ACC systems as either a standard or optional feature. This includes (but is not limited to) certain model years of the Chrysler 200 and 300, the Chrysler Pacifica, the Jeep Cherokee, Grand Cherokee, Compass and Renegade, the Dodge Charger, Challenger and Durango, and the Ram 1500.

20. As explained in more detail below, the FCA vehicles that come equipped with ACC fall within the scope of one or more claims of each of the Asserted Patents. Despite utilizing the inventions disclosed in the Asserted Patents, FCA has never had (and does not currently have) a license to practice the Asserted Patents. The Accused Products in this case encompass all FCA vehicles (model year 2013-Present) with ACC systems.

CLAIMS FOR RELIEF

21. Carrum has not obtained discovery about FCA's infringement. Nor has the Court construed the meaning of any claims or terms in the Asserted Patents. The allegations provided below are illustrative and without prejudice to Carrum's final infringement contentions provided under the Court's scheduling order and local rules. In providing these allegations, Carrum does not imply any particular claim constructions or otherwise limit the precise scope of the claims. Carrum's claim construction contentions regarding the meaning and scope of the claim terms will be provided under the Court's scheduling order and local rules.

COUNT ONE: Infringement of the '475 patent

22. Carrum incorporates all of the preceding paragraphs of this Complaint as if fully set forth herein.

23. On March 31, 2009, the United States Patent and Trademark Office lawfully issued the '475 patent, entitled "Automatic Lateral Acceleration Limiting and

NonThreat Target Rejection." Carrum is the sole owner and assignee of the '475 patent.

24. FCA has directly, literally under 35 U.S.C. § 271(a), and/or equivalently under the doctrine of equivalents, infringed the '475 patent by practicing the patented method and by making, using, selling, offering for sale, and/or importing in or into the United States, without authority, the Accused Products. The Accused Products meet each and every element of one or more claims of the '475 patent.

25. By way of illustration only, the ACC-equipped 2018 Jeep Grand Cherokee practices every step in the method described by claim 1 of the '475 patent. On information and belief, the ACC systems available in other FCA models (and vehicles of other model years) function in materially the same manner, and so those vehicles also infringe claim 1 of the '475 patent.

26. The 2018 Grand Cherokee has "an adaptive cruise control system capable of controlling a vehicle speed and obtaining a vehicle lateral acceleration." Ex. 1, col. 8. The Grand Cherokee's ACC system will "maintain a fixed set speed" unless an object is detected in an upcoming lane, in which case "ACC will apply limited braking or accelerate . . . automatically to maintain a preset following distance."[3] The Grand Cherokee's ACC system obtains vehicle dynamics data from

[3] 2018 Grand Cherokee Owner's Manual, at 290.

the anti-lock brake system ("ABS"), which contains a sensor measuring lateral acceleration.[4]

27. The 2018 Grand Cherokee "measur[es] a lateral acceleration from a lateral acceleration sensor," and "detect[s] a change in vehicle lateral acceleration based on a change in the measured lateral acceleration." Ex. 1, col. 8. The Grand Cherokee contains a "dynamics sensor," which includes "yaw rate, lateral acceleration and longitudinal acceleration sensors . . . housed into one unit."[5] A lateral acceleration sensor capable of measuring lateral acceleration will also necessarily detect any change in the measured lateral acceleration.

28. The 2018 Grand Cherokee can also "determin[e] when the vehicle is in a turn based on the detected change in the vehicle lateral acceleration." Ex. 1, col. 8. Various systems of the Grand Cherokee, such as the stability control system, use data provided by the ABS's dynamics sensor (including lateral acceleration data) to monitor whether the vehicle is in a curve and the path of the vehicle in the curve.[6]

29. Finally, "if [the] vehicle is in a turn," the 2018 Grand Cherokee can "reduc[e] the vehicle speed according to the determination that the vehicle is in the turn and the detected change in the vehicle lateral acceleration." Ex. 1, col. 8. "When

[4] Jeep Grand Cherokee 2018, Electrical/8E - Electronic Control Modules/MODULE, Adaptive Cruise Control (ACCM)/Operation, available at https://www.techauthority.com/; Jeep Grand Cherokee 2018, Brakes/05 – Brakes, ABS/Electrical/SENSOR, Dynamics/Description, available at https://www.techauthority.com/.
[5] Jeep Grand Cherokee 2018, Brakes/05 – Brakes, ABS/Electrical/SENSOR, Dynamics/Description, available at https://www.techauthority.com/.
[6] *See, e.g.,* 2018 Grand Cherokee Owner's Manual, at 169; Jeep Grand Cherokee 2018, Brakes/05 – Brakes, ABS/Description, available at https://www.techauthority.com/; "Chrysler Technologies Safety & Security Features Guide," available at https://www.winnipegdodge.com/chrysler-technologies-safty-features-guide.htm.

driving on a curve with ACC engaged," the Grand Cherokee's system "may decrease the vehicle speed and acceleration for stability reasons."[7] On information and belief, the ACC system determines whether the vehicle is in a curve based on the detected change in lateral acceleration. The stability control system uses data from the ABS system, including lateral acceleration data, to determine whether the vehicle is in a curve. The ACC system also relies on data received from the ABS system to determine whether to reduce the vehicle speed.[8] It can be inferred that the ACC system, like the stability control system, uses lateral acceleration data to determine when the vehicle is in a curve.

30. FCA has directly infringed the '475 patent by using the method described therein. For instance, on information and belief, FCA extensively tests its ACC systems prior to installing them on new vehicle models. Without practicing the patented method during vehicle tests, FCA would not have had the confidence in the safety or reliability of the system needed to install it on the vehicles it sells to the public.

31. Additionally, FCA has actively induced infringement of the patent under 35 U.S.C. § 271(b). On information and belief, at least as of the date upon which it learned of the '475 patent (which was no later than the date this Complaint was served), FCA induced, with specific intent, infringement of the '475 patent by its

[7] 2018 Jeep Grand Cherokee Owner's Manual, at 305.
[8] *See, e.g.,* Jeep Grand Cherokee 2018, Electrical/8E - Electronic Control Modules/MODULE, Adaptive Cruise Control (ACCM)/Operation, available at https://www.techauthority.com/.

customers under 35 U.S.C. § 271(b). FCA encouraged and facilitated infringing uses of the Accused Products through the creation and dissemination of promotional and marketing materials, instructional materials, product manuals, and/or technical materials to its customers.

COUNT TWO: Infringement of the '416 patent

32. Carrum incorporates all of the preceding paragraphs of this Complaint as if fully set forth herein.

33. On April 12, 2011, the United States Patent and Trademark Office lawfully issued the '416 patent, entitled "Automatic Lateral Acceleration Limiting and Non-Threat Target Rejection." The '416 patent is based on a divisional application relating to the '475 patent. Carrum is the sole owner and assignee of the '416 patent.

34. FCA has directly, literally under 35 U.S.C. § 271(a), and/or equivalently under the doctrine of equivalents, infringed the '416 patent by practicing the patented method and by making, using, selling, offering for sale, and/or importing in or into the United States, without authority, the Accused Products. The Accused Products meet each and every element of one or more claims of the '416 patent.

35. By way of illustration only, the 2018 Jeep Grand Cherokee comes equipped with an ACC system that meets every element of claim 10 of the '416 patent. On information and belief, the ACC systems available in other FCA models (and vehicles of other model years) function in materially the same manner, and so those vehicles also infringe claim 10 of the '416 patent.

36. The 2018 Grand Cherokee has "an adaptive cruise control system" for "use in controlling a vehicle at a vehicle speed." Ex. 2, col. 8. The Grand Cherokee has an ACC system which controls the vehicle speed.[9]

37. The 2018 Grand Cherokee has "a controller in communication with said adaptive cruise control system and capable of determining when the vehicle is in a turn, said controller operative to reduce the vehicle speed according to a vehicle position in the turn." Ex. 2, col. 8-9. The vehicle controller communicates with the ACC system by, *inter alia*, providing data from the ABS system, which is capable of determining when the vehicle is in a curve.[10] Then, "[w]hen driving on a curve with ACC engaged," the Grand Cherokee's system "may decrease the vehicle speed and acceleration for stability reasons."[11]

38. The 2018 Grand Cherokee has "at least one lateral acceleration sensor for generating a signal corresponding to a vehicle lateral acceleration, said lateral acceleration sensor in electrical communication with said controller and operative to detect a change in the vehicle lateral acceleration." Ex. 2, col. 9. The Grand Cherokee contains a lateral acceleration sensor, which is inherently operative to detect

[9] 2018 Jeep Grand Cherokee Owner's Manual, at 290.
[10] *See, e.g.,* Jeep Grand Cherokee 2018, Electrical/8E - Electronic Control Modules/MODULE, Adaptive Cruise Control (ACCM)/Operation, available at https://www.techauthority.com/; Jeep Grand Cherokee 2018, Brakes/05 – Brakes, ABS/Electrical/SENSOR, Dynamics/Description, available at https://www.techauthority.com/.
[11] 2018 Jeep Grand Cherokee Owner's Manual, at 305.

a change in the vehicle lateral acceleration.[12] This lateral acceleration sensor is in electrical communication with the controller.[13]

39. The 2018 Grand Cherokee has "at least one object detection sensor for detecting an object in a vehicle path of the vehicle during the turn, said object detection sensor in electrical communication with said controller, wherein said controller includes control logic operative to determine whether the object is in the vehicle path during the turn and ignoring the object for braking purposes when the object is not determined to be in the vehicle path." Ex. 2, col. 9. The Grand Cherokee's ACC system uses a radar-based object detection sensor.[14] The controller "receives and interprets the returned signals to detect any objects in the path of the vehicle as well as their speed and direction."[15] On information and belief, this control logic operates to determine whether the object is in the vehicle path during a turn. The Grand Cherokee slows down if the detected object is determined to be in the vehicle's path.[16] On information and belief, the Grand Cherokee ignores the detected object for braking purposes if the object is not determined to be in the vehicle's path.

[12] Jeep Grand Cherokee 2018, Brakes/05 – Brakes, ABS/Electrical/SENSOR, Dynamics/Description, available at https://www.techauthority.com/.
[13] *See, e.g.,* 2018 Grand Cherokee Owner's Manual, at 169; Jeep Grand Cherokee 2018, Brakes/05 – Brakes, ABS/Description, available at https://www.techauthority.com/; "Chrysler Technologies Safety & Security Features Guide," available at https://www.winnipegdodge.com/chrysler-technologies-safty-features-guide.htm.
[14] Jeep Grand Cherokee 2018, Electrical/8E - Electronic Control Modules/MODULE, Adaptive Cruise Control (ACCM)/Operation, available at https://www.techauthority.com/.
[15] *Id.*
[16] *See, e.g., id.* (ACC system "processes" inputs, including from the radar sensor, "to control and maintain the separation setting selected by the vehicle operator between the vehicle and any preceding vehicles").

40. FCA has directly infringed the '416 patent, including by making, selling, and offering for sale vehicles that contain the system disclosed in the '416 patent. Further, FCA uses the patented system, as it extensively tests its ACC systems prior to installing them on new vehicle models. Without practicing the patented method during vehicle tests, FCA would not have had the confidence in the safety or reliability of the system needed to install it on the vehicles it sells to the public.

41. Additionally, FCA has actively induced infringement of the patent under 35 U.S.C. § 271(b). On information and belief, at least as of the date upon which it learned of the '416 patent (which was no later than the date this Complaint was served), FCA induced, with specific intent, infringement of the '416 patent by its customers under 35 U.S.C. § 271(b). FCA encouraged and facilitated infringing uses of the Accused Products through the creation and dissemination of promotional and marketing materials, instructional materials, product manuals, and/or technical materials to its customers.

PRAYER FOR RELIEF

42. Carrum respectfully requests the following relief:

A. A judgment that FCA has infringed and continues to infringe one or more claims of the Asserted Patents, either literally or under the doctrine of equivalents;

B. A judgment and order awarding Carrum damages in accordance with 35 U.S.C. § 284;

C. A judgment and order requiring FCA to pay Carrum pre-judgment and post-judgment interest on the damages awarded;

D. A judgment and order finding this case to be exceptional and awarding Carrum costs, expenses, reasonable attorney's fees, and such other relief as the Court deems just and proper pursuant to 35 U.S.C. § 285;

E. A permanent injunction against FCA's direct infringement and/or FCA's active inducement of infringement of the Asserted patents, as well as against each of FCA's agents, employees, representatives, successors, and assigns, and those acting in privity or in concert with FCA; and

F. Any other relief as the Court may deem just and proper.

JURY DEMAND

Carrum demands a trial by jury of all issues so triable.

Dated: October 23, 2018

Respectfully submitted,

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