

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TOYOTA MOTOR CORP. AND KIA CORPORATION,
Petitioners,

v.

EMERGING AUTOMOTIVE LLC,
Patent Owner

Case IPR2024-00981
U.S. Patent 9,365,188

**DECLARATION OF DR. SAM MALEK IN SUPPORT OF PATENT
OWNER'S RESPONSE**

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I, Dr. Sam Malek, declare under penalty of perjury as follows:

I. INTRODUCTION AND BACKGROUND

1. I have been retained as an expert witness on behalf of Emerging Automotive LLC (“Emerging Auto”) to provide information and assistance regarding U.S. Patent No. 9,365,188 (“the ’188 patent”). Specifically, I have been asked to consider the Petition for Inter Partes Review numbered IPR2024-00981 (“the Petition”) regarding the ’188 patent, and specifically the Declaration of Dr. Almeroth (EX1003) that accompanies the Petition, as well as the Board’s Institution Decision.

2. In this declaration I provide my independent analysis of the ’188 patent in light of the materials cited below and discussed herein and my knowledge and experience in this field during the relevant time frame. I have been asked to consider what one of ordinary skill in the art at the time of the invention of the ’188 patent (a “POSITA,” see Section V below) would have understood from the specification, including scientific and technical knowledge related to the patent. I have also been asked to consider whether certain references would have rendered obvious the inventions described in the claims of the ’188 patent.

3. My findings, as explained below, are based on my study, experience, and background in the fields discussed below, informed by my education and my extensive experience in the field of cloud-based processing systems. I have also

relied on my review and analysis of the references identified by Dr. Almeroth, information provided to me, and information that I have independently reviewed. I have personal knowledge of the facts and opinions set forth in this declaration, and, if called upon to do so, I would testify competently thereto.

4. I am being compensated for my independent analysis as an expert with respect to this inter partes review proceeding. My compensation is not contingent in any way on the content of my analysis, the opinions that I offer, or the outcome of this proceeding. I have no financial interest in either Petitioner (Toyota or Kia) or Patent Owner (Emerging Auto) and I have no financial interest in the '188 patent.

II. QUALIFICATIONS

5. My qualifications for forming the opinions given in this declaration are summarized here and are addressed more fully in my curriculum vitae, which was submitted as EX2002. That exhibit also includes a list of my publications.

6. I have approximately 25 years of experience in the general area of computer and software technology in a variety of roles, including as a software engineer, software architect, and programmer at a variety of companies, as well as a researcher and professor at several universities.

7. I am currently a Full Professor of Software Engineering with tenure in the Informatics Department within the School of Information and Computer Sciences at the University of California, Irvine. I am also the Director of the

Software Engineering and Analysis Laboratory (“SEAL”). My general research interests are in the field of software engineering, and to date my focus has spanned the areas of software analysis and testing, mobile computing, architecture and design, and software dependability and security. The underlying theme of my research has been to devise techniques and tools that aid with the construction, analysis, and maintenance of largescale software systems.

8. I received my Ph.D. and M.S. degrees in Computer Science from the University of Southern California and my B.S. degree in Information and Computer Science from the University of California, Irvine. I have received numerous awards for my research contributions, including the Test of Time Award from the Association for Computing Machinery Special Interest Group on Software Engineering (2020), National Science Foundation CAREER award (2013), GMU Emerging Researcher/Scholar/Creator award (2013), and the GMU Computer Science Department Outstanding Faculty Research Award (2011).

9. I have authored over 130 peer-reviewed research publications. These publications have been highly cited (more than 11,000 times according to scholar.google.com). Many of my publications have dealt with the topics that are related to this proceeding, including distributed software systems, cloud computing, client-server architecture, and software settings and configuration. I provide a few examples here.

10. My Ph.D. dissertation resulted in novel algorithms for optimizing the deployment architecture of a distributed software system. The deployment architecture of a distributed software system is the allocation of its software components to its hardware devices. There are many deployments of a software system possible, but some may be superior to others with respect to certain quality of service objectives (e.g., latency, availability, security). One application of my dissertation work was in the context of cloud computing, because in most cloud-based software systems there are many geographically distributed nodes (servers) available for the deployment of software components.

11. I have also worked on techniques to leverage cloud computing for software testing. For instance, in an article titled “A Whitebox Approach for Automated Security Testing of Android Applications on the Cloud,” I showed how the resources in the cloud can be effectively harnessed to facilitate security testing at scale.

12. In another article titled “GLIDE: A Grid-based Lightweight Infrastructure for Data-intensive Environments,” I described the results of my work with colleagues from NASA in the development of a new distributed software system for sharing large amounts of data generated by NASA. This capability was the first of its kind in the realm of Grid Computing, which is a precursor to Cloud Computing.

13. A significant focus of my work has been on computer security, including electronic forms of access control and management of privileges in software systems. For instance, I led a team of researchers in a project sponsored by the Defense Advanced Research Project Agency (DARPA) to develop a novel approach for protecting Android applications from various form of access control attacks. The project resulted in the development of a tool called COVERT. I have published extensively on this work, including a highly cited manuscript that appeared in the IEEE Transactions on Software Engineering in 2015. In another project, I developed DelDroid, which at the time was the first approach for automated determination and enforcement of least privilege architecture in Android. This work was published in the Journal of Systems and Software in 2019.

14. I have received numerous research grants from a variety of organizations, including the National Science Foundation (NSF), Federal Bureau of Investigation (FBI), Air Force Office of Scientific Research, Department of Homeland Security (DHS), National Security Agency (NSA), Defense Advanced Research Projects Agency (DARPA), Office of the Director of National Intelligence, and Army Research Office among others. Software systems and results produced in my research lab have been adopted for use by various organizations in both private (e.g., Boeing, Bosch) and public (e.g., NASA, DHS, FBI) organizations. Many of the above-mentioned projects and software systems involved analysis and design of

client-server software systems deployed on the cloud. For instance, in a project called “RASS: Resilient Autonomic Software Systems” funded by Air Force Office of Scientific Research, I led a team of researchers to develop a new method of automatically adapting Air Force’s software systems to fluctuations in communication networks, thereby making them resilient to network interruptions.

15. I also have several years of experience as a software engineer, software architect, and programmer at a variety of companies, namely the Boeing Company, PricewaterhouseCoopers Consulting (later acquired by International Business Machines (“IBM”) Corporation), FieldCentrix, and Neural Computing Systems Lab. During my tenure in the industry, I gained professional experience in the design, development, and management of largescale software engineering efforts. Among the software systems that I designed and developed were commercial ecommerce and enterprise software systems. Many of the software systems developed in the context of my professional experience were built according to the general client-server architectural style and deployed on the cloud or cloud-like environments. In most of these systems, the server held the state of the distributed application, allowing for that state, such as the preferred user settings, to be transferred to client at runtime.

16. I have taught software engineering and computer science courses on a regular basis at the B.S., M.S., and Ph.D. levels at the universities where I have been

employed. I cover concepts related to cloud computing, distributed software, client-server architectural style, authentication, encryption techniques, access control mechanisms, and protocols for exchange of electronics credentials (e.g., electronic keys, passwords, and tokens) in many of the courses that I teach at the university. Notably, I have regularly taught distributed software engineering courses at UC Irvine and previously at George Mason University (GMU). In these courses, I cover concepts such as the client-server architectural style, cloud computing principles, and server-side storage of user-defined preferences.

17. I have been a frequent speaker at scientific conferences, symposia, workshops, and gatherings of software engineering academics and professionals. I have served as chair, committee member, and reviewer for numerous software engineering journals, magazines, and conferences. I have served on the editorial board of the ACM Transactions on Software Engineering and Methodology, IEEE Transactions on Software Engineering, the ACM Transactions on Autonomous and Adaptive Systems, the Springer Journal of Automated Software Engineering, and the Springer Journal of Computing. I am a member of the Association for Computing Machinery (ACM), ACM Special Interest Group on Software Engineering (SIGSOFT), and the Institute of Electrical and Electronics Engineers (IEEE). I have testified at trial and deposition as an expert witness in numerous cases in the past five years.

III. MATERIALS CONSIDERED

18. In preparing this declaration and forming my opinions, I have considered: the claims, specification, and prosecution history of the '188 patent; the Petition and declaration by Dr. Almeroth (including all materials cited in each); and all materials cited and discussed in this declaration. In addition, I have considered the relevant legal standards, as they have been explained to me by counsel and as I understand them. I have also considered the knowledge and understanding of a person of ordinary skill at the time of the invention of the '188 patent, of which I am familiar. As part of my analysis for this matter, I have also considered my own knowledge and experience, including my work and experience with cloud-based processing systems.

IV. LEGAL PRINCIPLES

19. In forming my opinions here, I have applied the following understanding of certain legal concepts related to anticipation, obviousness, combinations of references, and knowledge of one of ordinary skill in the art. Counsel for Patent Owner has informed me of legal principles that apply in this proceeding.

20. It is my understanding that assessing the validity / patentability of a U.S. patent claim based on a prior art analysis requires two essential steps. First, one must analyze the terms of the patent claims to understand what meaning one of

ordinary skill in the art would give the terms. Second, one may then assess validity by comparing a patent claim to the “prior art.” I understand that the teaching of the prior art is viewed through the eyes of a person of ordinary skill in the art at the time the invention was made. My opinion as to what constitutes a relevant person of ordinary skill in the art is set forth below.

21. I have been informed that in order for a patent claim to be invalid as anticipated by a prior art reference under 35 U.S.C. § 102, each and every element of that patent claim must be found disclosed in that reference, explicitly or inherently, to a person of ordinary skill in the art. Inherent disclosure requires that the claimed element be the only possible option given the other disclosures of the reference, and that it would be so recognized by persons of ordinary skill in the art. I also understand that the missing descriptive material cannot merely be probably or possibly present. If any single element of a claim is not disclosed in the reference, the entire claim is not anticipated. I understand that a prior art reference merely capable of being modified so as to operate in the same manner as the patented device or system does not anticipate. I further understand that obviousness is not inherent anticipation, and that it is insufficient that a missing limitation is so similar to a limitation actually disclosed in the reference that one of ordinary skill in the art would see the substitution as obvious. I also understand that, if it is necessary to reach beyond the boundaries of a single reference to provide missing disclosure of

the claimed invention, the proper ground for asserting invalidity is not anticipation, but obviousness.

22. I understand that a claim is invalid as obvious under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art.

23. I understand that a person of ordinary skill in the art provides a reference point from which the prior art and the claimed invention should be viewed. This reference point prevents one from using his or her own insight or hindsight in deciding whether a claim is obvious.

24. I have been informed that the following factors are used to determine whether or not the claimed subject matter would have been obvious: (i) the scope and content of the prior art; (ii) the differences between the prior art and the claimed invention; (iii) the level of ordinary skill in the field of the invention; and (iv) any relevant objective considerations of non-obviousness, such as commercial success, long-felt but unresolved needs, failure of others, etc.

25. I also understand that in considering the scope and content of the prior art, references must be reasonably related (i.e., analogous) to the claimed invention of that patent. I understand that the test for determining whether a prior art reference constitutes analogous art to the claimed invention is (1) whether the reference is from

the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference is still reasonably pertinent to the particular problem the inventor is trying to solve.

26. I understand that a party asserting obviousness based on a combination of prior art references must demonstrate that one of ordinary skill in the art would have been motivated to combine the teachings of those references to achieve the claimed invention and that the skilled artisan would have had a reasonable expectation of success in doing so. It is my understanding that it is not enough to show that one skilled in the art could combine elements of multiple references, but instead there must be some reason that would have prompted a person of ordinary skill in the art to combine the elements in the way the claimed invention does. I understand that there must be some reasoned explanation as to why one of ordinary skill in the art would combine the references. The reason cannot come from hindsight.

27. I understand that in considering whether a claimed invention is obvious, one may but is not required to find obviousness if at the time of the claimed invention there was a reason that would have prompted a person having ordinary skill in the field of the invention to combine the known elements in a way the claimed invention does, taking into account such factors as: (1) whether the claimed invention was merely the predictable result of using prior art elements according to their known

function(s); (2) whether the claimed invention provides an obvious solution to a known problem in the relevant field; (3) whether the prior art teaches or suggests the desirability of combining elements claimed in the invention; (4) whether the prior art teaches away from combining elements in the claimed invention; (5) whether it would have been obvious to try the combinations of elements, such as when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions; and (6) whether the change resulted more from design incentives or other market forces. To find it rendered the invention obvious, the prior art must provide a reasonable expectation of success. Obvious to try is not sufficient in unpredictable technologies.

28. I understand that each claim must be evaluated separately for obviousness, and that it is improper to use hindsight. I understand that the disclosures in a patent or a prior art reference are viewed from the perspective of a person of ordinary skill in the art at the time of the invention. The obviousness analysis by a person of ordinary skill in the art must consider only what was known at the time of the invention.

29. It is my further understanding that obviousness cannot be based on a hindsight combination of components selected from one or more prior art references. I also understand that an invention would not have been obvious simply because all of the elements of the invention may have been known separately in the prior art.

30. I understand that a combination of disclosures or references would not have been obvious if the alleged modification(s) to be made to the reference(s) would have been inconsistent with the reference's stated goals or would have rendered the combination inoperable for its intended purpose. I further understand that for something to have been obvious, the party asserting obviousness must explain why a POSITA would have selected components or features for combination in the manner claimed.

31. I have been informed that a prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention.

32. I understand that with respect to claim construction, the proper construction is considered in the context of, and must be consistent with, the specification and that the claim language should be read in light of the specification and file history as it would be interpreted by one of ordinary skill in the art.

V. PERSON OF ORDINARY SKILL IN THE ART ("POSITA")

33. Counsel for Patent Owner has informed me that a person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. The '188 patent properly claims priority to the Provisional application No. 61/745,729 application, which was filed on December 24, 2012. As shown on its face, the '188 patent claims priority to "Provisional

application No. 61,745,729.” ’188 patent face page item 60; *see also id.* at 1:7-29 (listing the ’729 application in the “claim of priority”).

34. For the purpose of this Declaration, and based on my opinions herein, the time of invention for the ’188 patent is December 2012. However, I understand that Dr. Almeroth opines that the time of the invention is October 2013. Any invention date from the early 2010s to the mid-2010s would not alter my opinion regarding a person of ordinary skill in the art. Thus my opinion regarding a POSITA applies to either a date of invention in December 2012 or a date of invention in October 2013.

35. In my opinion, the relevant field of art for the ’188 patent is that of cloud-based processing systems.

36. I have been informed by counsel for Patent Owner that the person of ordinary skill is generally familiar with the type of problems encountered in the field and the prior art solutions to those problems and possesses an ordinary level of creativity.

37. I understand that Petitioners’ expert, Dr. Almeroth, opined that a person of ordinary skill in the art would have “had at least a four-year undergraduate degree in electrical engineering, automotive engineering, or a closely related field and at least two years of experience in the fields of access control systems, vehicle electronics, and/or cryptography. Additional education could substitute for

processional experience and vice versa. A person of ordinary skill in the art would also be able to understand and apply the prior art discussed herein.” EX1003, Almeroth Decl., ¶ 79.

38. For purposes of this declaration, I apply Dr. Almeroth’s definition. However, I note that the opinions I set forth below are applicable under any reasonable definition of a POSITA. I also note that I qualify as a POSITA under Dr. Almeroth’s proposed definition.

VI. BACKGROUND

A. Overview of the ’188 Patent

39. United States Patent Number 9,365,188 (the “’188 patent”) is titled “Methods and Systems for Using Cloud Services to Assign E-Keys to Access Vehicles.” EX1001, Face Page. The ’188 patent “relates to systems and methods for generating and sharing electronic keys (e-Keys) with users and cloud-based processing systems.” *Id.* at 1:33-35, 1:54-63.

40. The ’188 patent describes providing vehicle access to individuals, including an owner or “guest driver,” such as a friend, spouse, or valet, by an e-key, which allows the holder of the e-key to use the vehicle. *Id.* 8:40-54. An e-key may be sent from a vehicle owner to another person, such as a guest driver. *Id.* 8:54-63. In addition to allowing use of the vehicle, the e-key can further include conditions of use of the vehicle, which define one or more privileges associated to the use of

the e-key, including speed limits, geographic restrictions, amount of time, etc. *Id.*; *see also id.*, 2:27-31, 3:35-39. For example, with an e-key, “the vehicle can be loaned to a child of driving age ... and the child can be provided with restricted use of the vehicle.” *Id.* at 12:58-60. The ’188 patent describes creating profiles for users that have privileges set by an administrator. *Id.* at 15:11-24.

41. For example, accounts for a driver may be created with “defined roles,” which can “include a set of privileges,” such as speed limit or geographic privileges. *Id.* at 34:28-39. In this way, logins of user profiles can be dynamically controlled. For example, “[a]dministrators can decide which settings are locked for specific logins or roles, which are open for the login user to toggle and which settings are to be enforced.” *Id.* at 15:25-33. “[U]se of the vehicle can be restricted to predefined rules,” including those based on the user profile. *Id.* at 20:23-27.

42. As claimed, the owner or administrator’s request to generate an e-key is “receiv[ed], by a server ... from a user via a user account that has a vehicle associated therewith” and “the request includes a condition of use of the vehicle as set by the user by the user via the user account.” *Id.* at claims 1, 16 and 19. The e-key is then “generat[ed], by the server ... the e-key being assigned with the condition of use of the vehicle.” *Id.*

B. Prosecution History of the '188 Patent

43. As part of my analysis, I reviewed the file history of the '188 patent. The applicants filed the application for the '188 patent on June 12, 2014. EX1002, 254. The applicants submitted an information disclosure statement ("IDS") identifying the same *Zaid* reference asserted in the Petition and cited by Dr. Almeroth. EX1002, at 84. The Primary Examiner for the prosecution of the '188 patent, Yalkew Fantu, considered *Zaid*, and signed an IDS attesting to that fact. EX1002, at 52. Examiner Fantu also initiated and conducted an interview with the applicants. EX1002, 21. Examiner Fantu cited application number 14/063,638, patented as U.S. Patent No. 9,189,900 (the "'900 patent"), as presenting a potential obviousness double patenting issue. EX1002, 21. The applicants agreed to amend claim 1 and file a terminal disclaimer to overcome a potential obviousness double patenting rejection. EX1002, 21, 61. Examiner Fantu approved the applicants' amendments, the terminal disclaimer, and signed an IDS indicating he considered the *Zaid* reference. EX1002, 17, 52. The Examiner allowed the claims, identifying "two references, Teramura and Shiim, are the closest prior art of record." *Id.*

VII. SUMMARY OF KLEVE (EX1004)

44. Kleve discloses a system for a credential check and authorization solution for personal vehicle rental. EX1004, title. Kleve's system allows the parties to negotiate terms of a rental agreement, sign a rental contract, input identifying

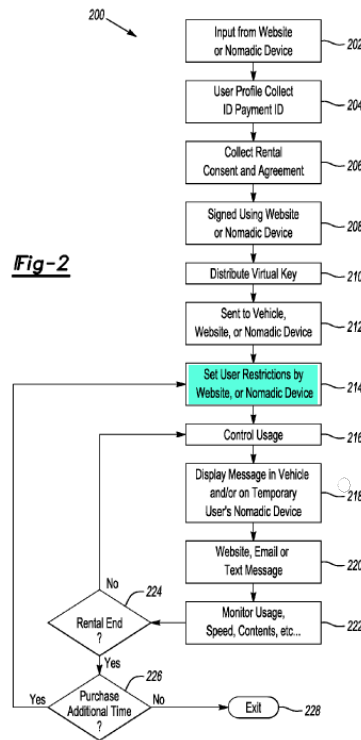
information for the Temporary User that is used as a credential virtual key, and at the beginning of the rental term, the Vehicle Owner has the option to set user restrictions which the vehicle's vehicle based computing system ("VCS") will use to monitor and control the usage of the vehicle. EX1004, ¶¶ 40-43, 51, 75.

45. Kleve generally discloses that the Owner and Temporary User will agree to terms and sign a rental agreement before a virtual key is distributed (e.g., Figure 2, ¶ 62), however Kleve's system also discloses that the virtual key may be already be distributed to the Temporary User, and the Temporary User does not "agree to rental terms" until they have already entered the vehicle. *Id.*, ¶ 65 (using vehicle hardware to agree to terms). Whether the rental agreement is formed before the virtual key is set up or distributed or the Temporary User agrees to terms at the vehicle after the virtual key has been requested and distributed, Kleve does not teach or suggest that the rental agreement terms are included in the set up of a virtual key or the virtual key itself. EX1004. Kleve does not teach or suggest that any rental agreement terms are included as any condition of use in the set up or distribution of a virtual key.

46. Kleve teaches a different solution for controlling vehicle usage. Kleve's system allows the Owner "control of the vehicle with the use of vehicle restrictions limits initially set by the Owner at the beginning of the rental term." *Id.*, ¶¶ 43, 75 ("the system may begin to download performance limitations and restrictions

assigned by the vehicle owner at the start of the rental period”), Figs. 2, 7A. “At the beginning of the rental term,” the vehicle owner may set restrictions that can include the very same restrictions the parties had agreed to as part of the rental agreement, i.e., to “enforce compliance with the rental agreement terms,” and the owner may set additional user restrictions for monitoring and control, such as speed, wherein those restrictions will be monitored and controlled by the vehicle’s VCS. *Id.*, ¶¶ 40-41, 43, 51, 75. By this solution, the Owner can enforce compliance with specific rental agreement terms, by inputting, for example, load weight restrictions, as well as set additional user restrictions that are not necessarily agreed or contemplated in the rental agreement. *Id.*

47. Kleve’s Figure 2, below, shows step 214, which is when the Owner first has access to control usage of the vehicle being rented by the user by inputting “user restrictions.” *Id.*, Fig. 2, *Id.*, ¶¶ 40, 43 (“restriction limits initially set by the Owner at the beginning of the rental term”). “At step 214, the Owner may have access to control usage of the vehicle being rented by the Temporary User. The Owner may set user restrictions by use of the website or nomadic device. The restrictions may be based on ... the owner’s selection of parameters including ... speed, global position coordinates, or load weight restrictions.” *Id.*, ¶ 40.



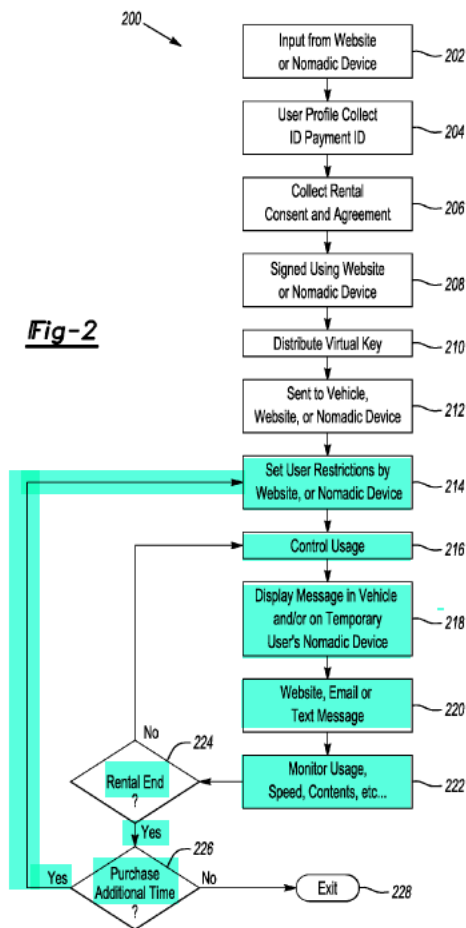
48. Kleve’s system allows the Owner access to set restrictions initially at step 214. *Id.*, ¶¶ 40, 43, Fig. 2. At step 210, the system distributes a virtual key. *Id.*, Fig. 2. Before the “Owner may have access to control usage of the vehicle being rented by the Temporary User,” i.e., to “set user restrictions” at step 214, the virtual key has already been created and distributed. *Id.*, ¶¶ 40, 43, Fig. 2.

49. Kleve explains that its solution allows only the Owner to set user restrictions that will be monitored and controlled by the vehicle’s VCS, because “[c]ontrolling usage to enforce compliance with rental agreement terms may be of more importance to a vehicle rental micro-business owner as this may be the only vehicle the Owner possesses.” *Id.*, ¶¶ 51, 40-43, 75. I note that it would not be

necessary for Kleve to have this solution to “enforce compliance with rental agreement terms” if the rental agreement terms were already included as “conditions of use” in Kleve’s “set up” or distribution of the virtual key. *Id.*

50. Kleve teaches that the very same restrictions that the parties had agreed to in the rental agreement, such as “load weight restrictions” (*id.*, ¶¶ 84-85, 89-90), must be input by the Owner as a “user restriction” at step 214, in order to “enforce” and “control” the agreed-upon “load weight restrictions” (*id.*, ¶¶ 40, 51) (“owner may set user restrictions” e.g., “load weight restrictions”).

51. As another example, “rental period end time” is one of the “user restrictions” which is set by the Owner at the beginning of the rental term, at step 214 (*id.*, ¶ 40), even if the rental period was already agreed-to by the parties in their rental agreement (*id.*, ¶¶ 38-39). “At step 226, if the Temporary User decides that he may need to purchase additional rental time, the system may update the new rental period end time restriction and continue to monitor usage of the vehicle.” *Id.*, ¶¶ 43, 54; *see id.*, Fig. 2. Figure 2 illustrates that the system will return to step 214, to “update the new rental period end time restriction” and the system will continue to monitor the vehicle usage, at steps 216, 218, 220, and 222. *Id.*



Id., Fig. 2 (annot.).

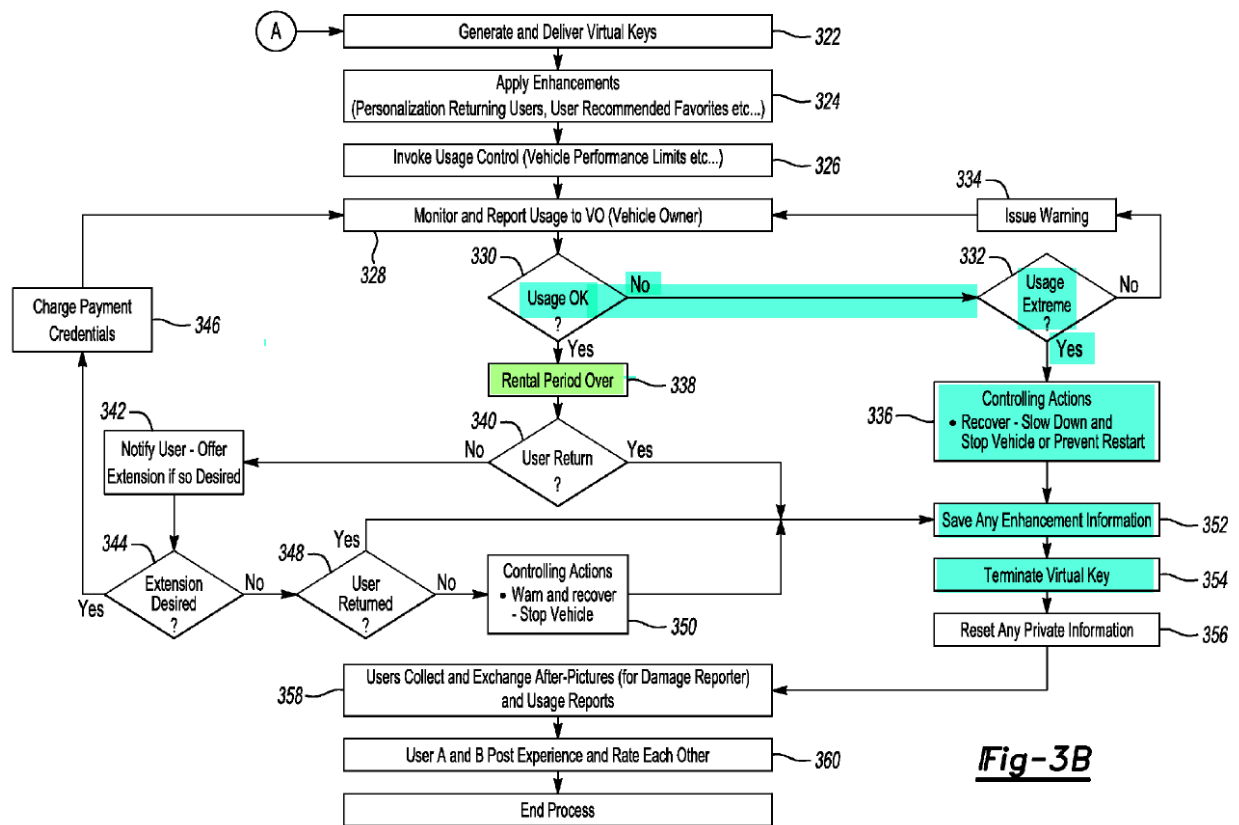
52. It would not be necessary for Kleve to require a discrete operation for the Owner to “set user restrictions” at step 214—restrictions that may include *the very same restrictions* the parties had agreed to in the rental agreement—if the rental agreement restrictions were already included as “conditions of use” in Kleve’s “set up” or distribution of the virtual key, at step 210. *Id.*, ¶¶ 84-85, 89-90, 40, 51.

53. Kleve’s system provides several examples in which the virtual key is not only operable during the agreed-upon rental period. That is, the virtual key may

be operable outside of the agreed-upon rental period, e.g., via a rental end time update, and the virtual key may be terminated before the agreed-upon rental period and after the end of the agreed-upon rental period.

54. Kleve's system teaches a vehicle rental "exit mode process," which involves several steps, including "terminating the virtual key" (*id.*, ¶ 80), and that "exit mode process" may be initiated before or after the agreed-upon rental period expiration (*id.*, ¶¶ 43, 53-55, 79-80).

55. For example, if "a restriction threshold has been violated," and the usage is "extreme," the VCS may "put the vehicle in a remedial action," such as engine shut down and immobilization. *Id.*, ¶ 53, Fig. 3B. Then the system will "save any enhancement information" and "terminate [the] virtual key." *Id.*, Fig 3B. In this example, the virtual key is terminated based on the user restriction violation, irrespective of whether an agreed-to rental period has ended. *Id.*



Id., Fig. 3B.

56. Kleve also teaches that if an accident is detected and the vehicle's condition is unsafe to drive, the virtual key will terminate, regardless of the "rental end" time. *Id.*, ¶¶ 79-80, 53, Fig. 7B.

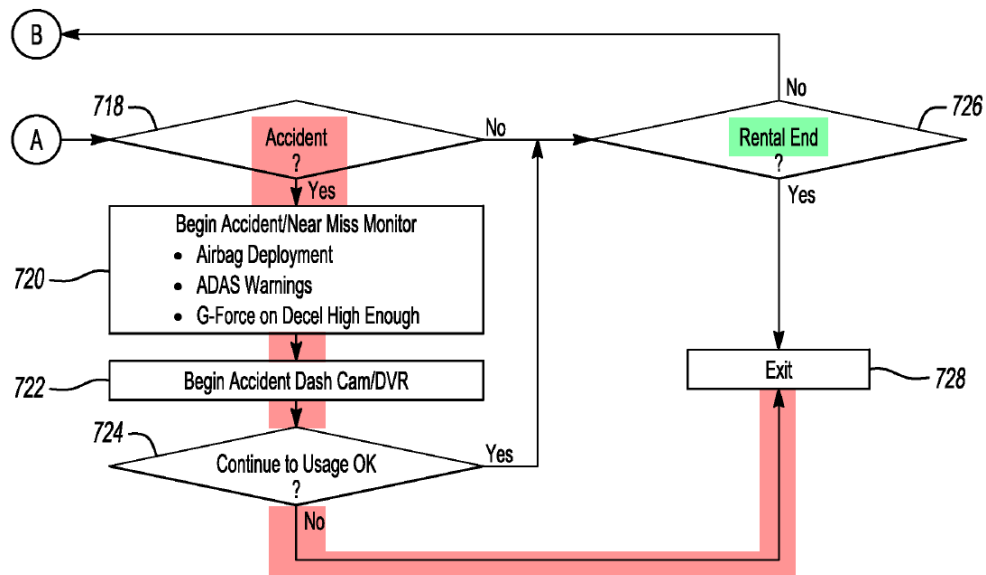
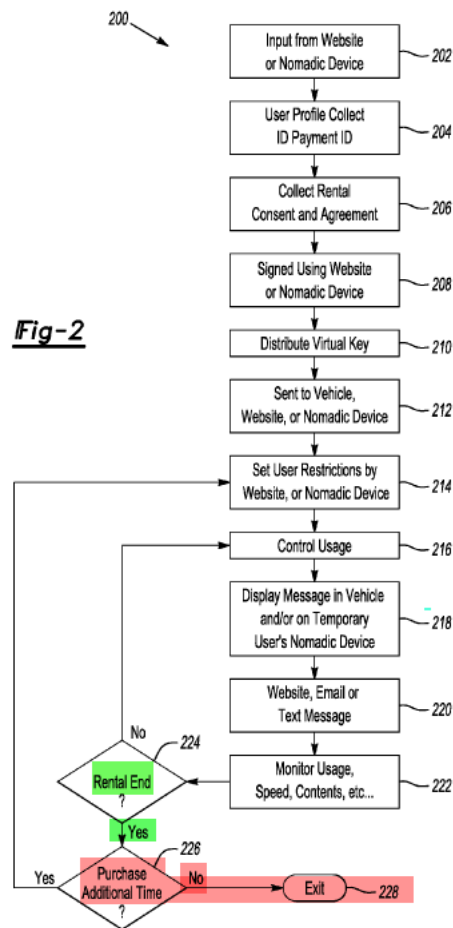


Fig-7B

Id., Fig. 7B.

57. Kleve teaches additional examples where the virtual key is operable after the rental term has ended and will not be terminated until the vehicle rental exit process, which is after the rental period is over. *E.g., id.*, ¶ 54. For example, “[i]f the rental term has ended, and no additional time is purchased, the system may begin the vehicle rental exit process within the VCS,” at step 228. *Id.*, ¶ 43, Fig. 2.

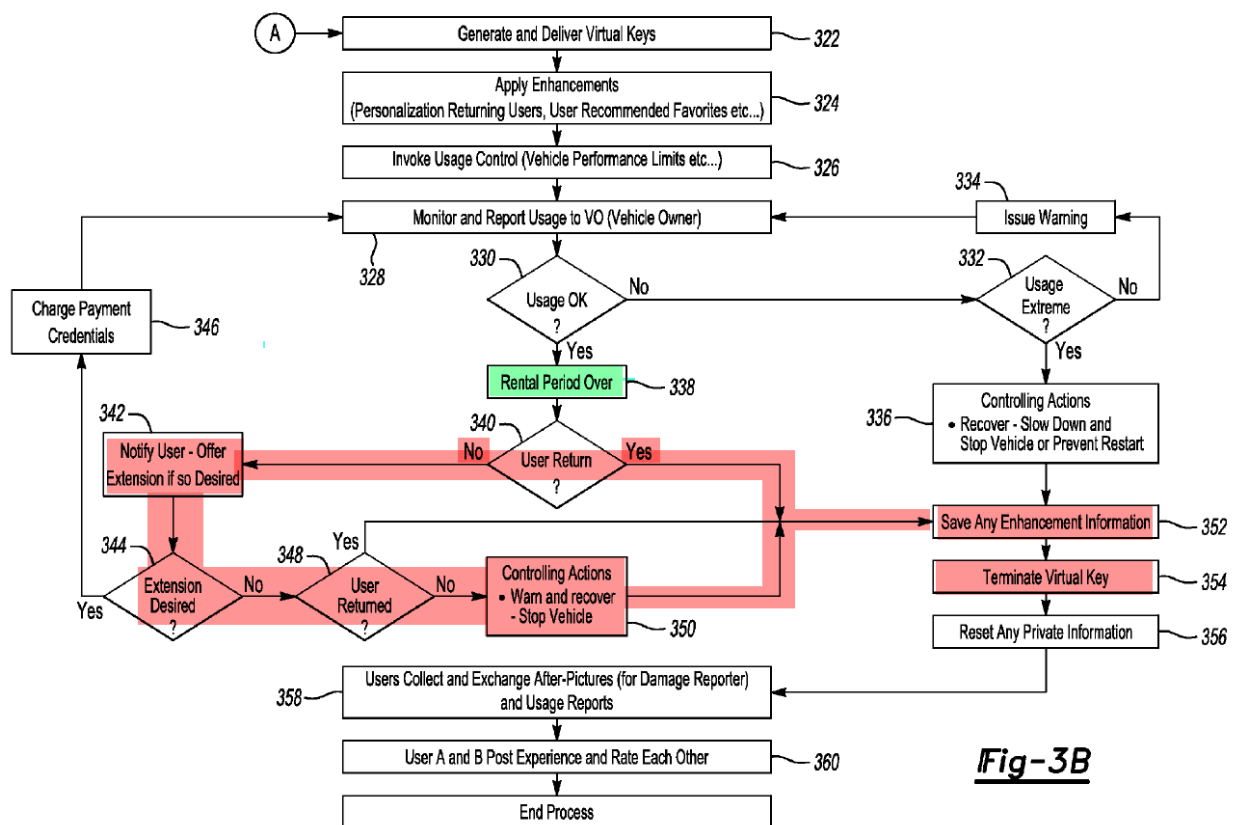


Id., Fig. 2.

58. As shown above at step 228, if no additional time is purchased, the system will proceed with a “vehicle exit mode process” after the rental period has ended. *Id.* Similarly, in the above example where an accident is detected by the VCS, but the vehicle is deemed safe to drive, the system will proceed with a “vehicle exit mode process” after the rental period has ended. *Id.*, ¶ 80 (“if the rental period has

ended, the monitoring and control system of the vehicle rental micro-business may begin to start its Temporary User vehicle rental exit mode process.”).

59. For example, after “the Temporary User has completed the rental period” and after the Temporary User “has returned the vehicle to the appropriate drop off, the virtual key may terminate.” *Id.*, ¶¶ 55, 49 (same), Fig. 3B.

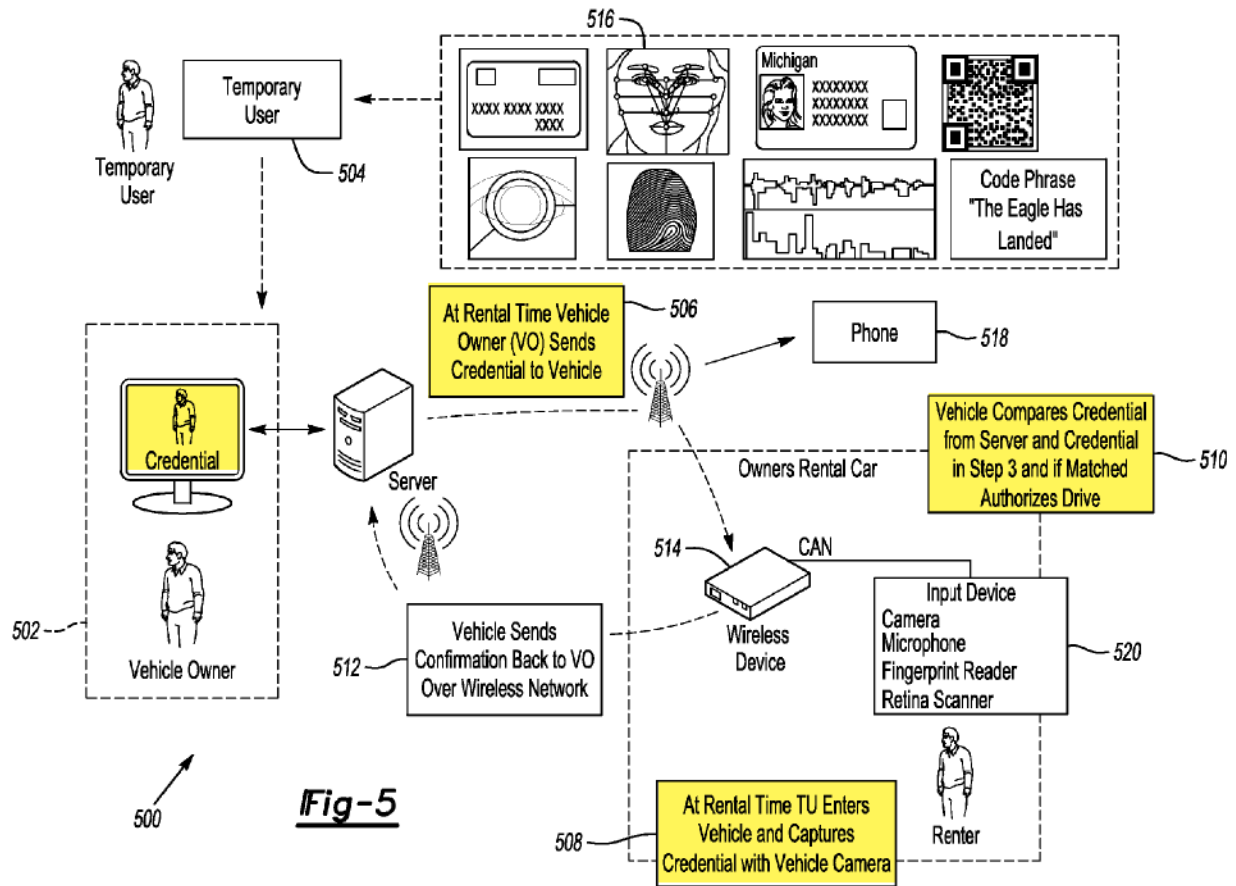


Id., Fig. 3B.

60. As another example, if “the rental period has expired,” but the Temporary User has not yet returned the vehicle, and the rental period end time is not extended, “the system may transmit controlling action to warn and induce

remedial actions at step 350.” *Id.*, ¶ 54, Fig. 3B. After terminating the virtual key at step 354, the system will reset any private information stored on the VCS at step 356. *Id.*, ¶¶ 80, 49, Fig. 3B.

61. I also note that Kleve’s disclosures regarding the set up of a virtual key do not involve the input or inclusion of any conditions of use. Kleve teaches that “to set up a virtual key,” the Vehicle Owner enters a vehicle authorization credential or “unique Temporary User identification” (*id.*, Fig. 5: 504, 516), which was received from the Temporary User (*id.*, ¶ 62, Fig. 5). Kleve instructs that the Vehicle Owner sends this same “credential” to the vehicle, e.g., via a server, and the Temporary User will provide this same credential to the vehicle, e.g., captured via camera, microphone, etc. *Id.*, Fig. 5. As shown in Figure 5 below, the vehicle compares the credential from the Owner and the credential captured from the Temporary User to authorize the Temporary User’s drive. *Id.*, Fig. 5, step 510.



Id., Fig. 5.

VIII. SUMMARY OF ZAID (EX1008)

62. United States Publication Number 2011/0112969 by Zaid et al. (EX1008, “Zaid”) is titled “Vehicle Access Control Services and Platform.”

63. The inapplicability of Zaid is manifest in the reference itself. Unlike the independent patent claims, Zaid does not involve any request to a server to generate an e-key. Instead, Zaid describes a “vehicle reservation,” which can be made after a Facebook or other social networking site account holder logs into their account and

views an advertisement of this vehicle available for rent. EX1008, ¶ 72. Once the renter makes the reservation, that reservation is relayed as an encrypted message. *Id.*, ¶ 70. Zaid does not suggest that this relayed reservation message is the generation of an e-key. Instead, the encryption disclosed by Zaid merely converts the message from one form to another. The vehicle reservation described by Zaid also does not suggest or teach a request to generate an e-key. EX1008. Zaid does not disclose or suggest any user account that has a vehicle associated therewith, wherein the user can set a condition of use of the vehicle via that user account nor any user account via which the user can submit a request to generate an e-key.

IX. DETAILED ANALYSIS OF PETITION GROUNDS

64. As I describe in detail below, it is my opinion that Dr. Almeroth and the Petition fail to demonstrate that any claim of the '188 patent is invalid.

A. Each of the Kleve-based grounds (grounds 1-3, 7) fails to establish obviousness of any challenged claim.

65. The independent claims require “a request from a user ... to generate an ... e-key ... [that] includes a condition of use of the vehicle” and “generating ... the e-key being assigned with the condition of use of the vehicle.” EX1001, claim 1[a-b], 19[a-b], claim 16[b] (“the e-key being associated with the condition of use of the vehicle”).

1. Each of the “restrictions” identified by Petitioners as allegedly “sent with the request to generate a virtual

key” are unavailable to be set until after the set up and distribution of the virtual key.

66. It is my opinion Kleve does not teach or suggest a request to generate an e-key that includes a condition of use of the vehicle, as required by the claims. Petitioners and Dr. Almeroth identify a number of “restrictions” alleged to be “conditions of use” “sent with the request to generate a virtual key,” but Kleve makes clear that none of these “restrictions” is available as a restriction to monitor or control vehicle usage until after the set up and distribution of the virtual key. Pet. 15 (citing EX1004, ¶¶ 38, 40, 51, 73, 75); EX1003, ¶¶ 119-120 (same). Kleve teaches a solution that gives the Owner “control of the vehicle with the use of vehicle restriction limits initially set by the Owner at the beginning of the rental term.” EX1004, ¶¶ 43, 75.

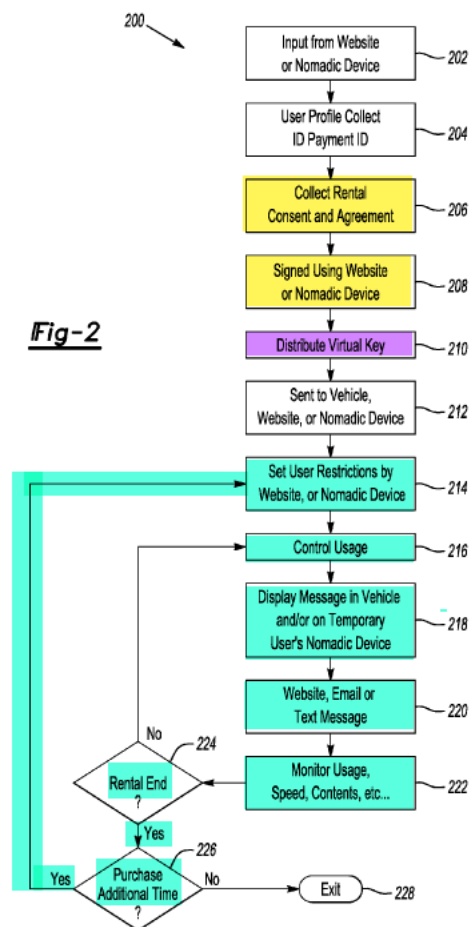
67. As the identified request to generate an e-key, Petitioners rely on Kleve’s disclosure that “the Vehicle Owner may enter in vehicle authorization credentials based on information received by the Temporary User to set up a virtual key.” Pet. 10-11 (citing EX1004, ¶ 62). Kleve teaches that the “distribution” of this virtual key credential occurs at step 210. EX1004, ¶¶ 62, 39, Fig. 2.

68. As the “restrictions” allegedly “sent with the request to generate a virtual key,” Dr. Almeroth first points to “the ‘rental period’ (¶ [0038]) [and] ‘what can and cannot be transported’ (*id.*)” (EX1003, ¶¶ 119-120). I disagree with this

opinion. At paragraph 38, Kleve describes steps 206 and 208 (EX1004, ¶ 38, Fig. 2), in which the “terms and conditions for the rental period” may be agreed to by the parties, and the rental agreement may even be “tailor[ed]” “to include what can and cannot be transported” (*id.*, ¶ 38). As I discuss above in Section VII, none of the rental agreement terms, including any “rental period” described in paragraph 38, is disclosed or suggested to be “sent with the request to generate a virtual key.” *Id.* I also note that there is no mention in paragraph 38 of any “virtual key.” *Id.* At paragraph 38, Kleve describes the Vehicle Owner and Temporary User formulating a rental agreement, at steps 206 and 208, and those steps precede the distribution of the virtual key (step 210). *Id.*; *id.*, Fig. 2. Kleve teaches that user restrictions for monitoring and controlling vehicle usage are “initially set at ... the beginning of the rental term.” EX1004, ¶¶ 43, 75 (“restrictions assigned ... at the start of the rental period”).

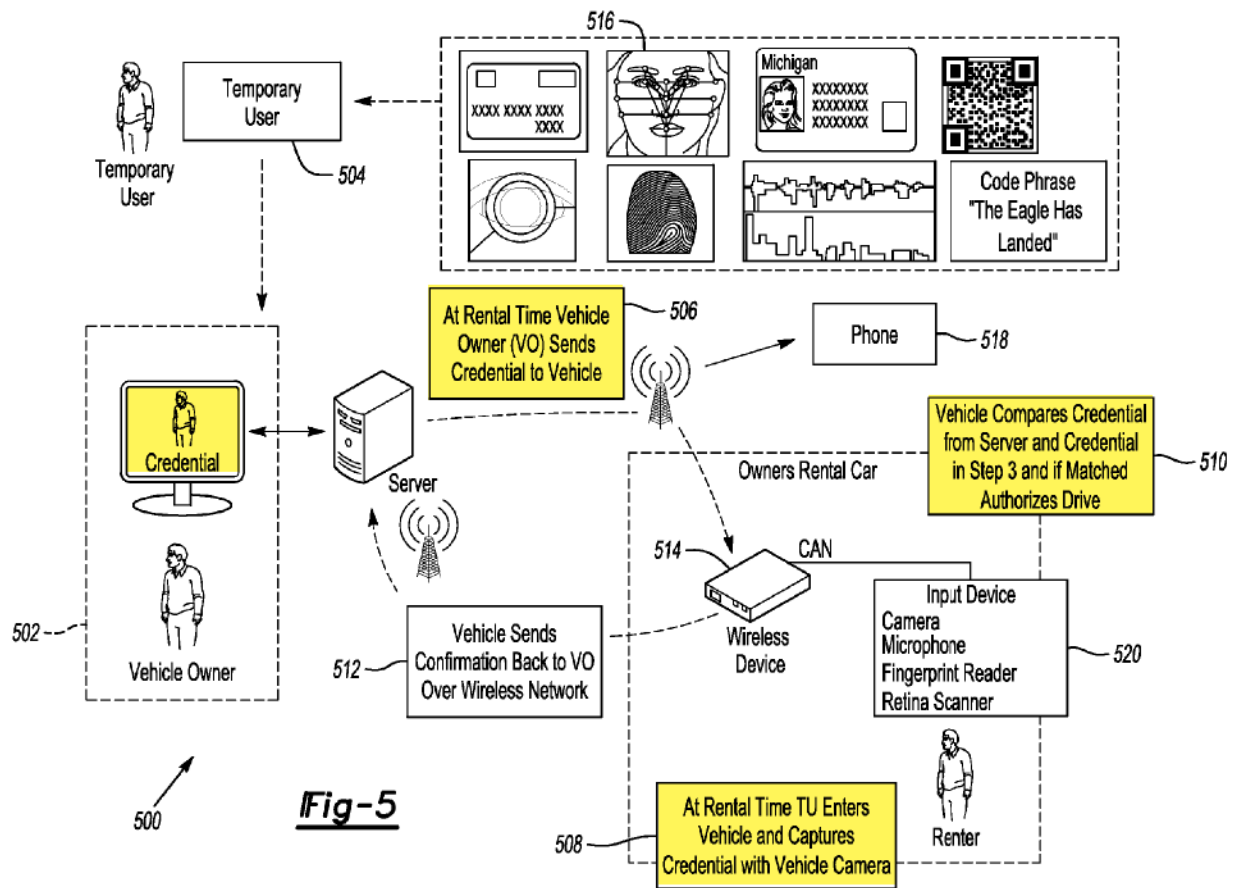
69. Also, as I describe above in Section VII, Kleve describes a solution to “enforce” any “rental end time restriction” which does not involve including any rental agreement terms, such as “rental period,” in the set up or distribution of the virtual key. EX1004, ¶ 43, Fig. 2. Regardless of what “rental period” may have been agreed to by the parties in their rental agreement, Kleve teaches that “rental period end time” is a “restriction” that may be set by the Owner, at 214, and, if extended, the “system may update the new rental period end time restriction”—in step 214—

and “continue to monitor usage of the vehicle.” *Id.*, ¶ 43, Fig. 2. If “rental period” was somehow included in the virtual key, at step 210 (or even earlier), as Dr. Almeroth opines, it would make no sense for Kleve to update only step 214, in order to “update the new rental period end time restriction,” at step 226 → 214 (Figure 2), but not at step 210 or steps 206 or 208. EX1003, ¶¶ 119-120; EX1004, ¶ 43, Fig. 2.



Id., Fig. 2.

70. I also note that Kleve teaches that the Owner sends the authorization “credential” to the vehicle “at Rental Time.” *Id.*, ¶ 66, Fig. 5. In this way, Kleve’s solution ensures that “the scheduled rental period of time begins” according to the agreed-upon rental period. *Id.*, ¶¶ 66, 62, Fig. 5. Kleve further teaches that “[a]t Rental Time” the Temporary User enters the vehicle, the vehicle captures the User’s credential, the vehicle compares the two credentials, and “if matched authorizes drive.” *Id.*, ¶ 66, Fig. 5. If the “rental time” was somehow included in the set up or distribution of the virtual key, as Dr. Almeroth opines, it would be unnecessary that the “Vehicle (VO) Owner sends [the] credential to [the] vehicle” (*id.*, Fig. 5, ¶ 66) “at rental time,” i.e., “[w]hen the scheduled rental period of time begins” (*id.*, ¶ 66, Fig. 5).



Id., Fig. 5.

71. Dr. Almeroth additionally identifies Kleve’s description of “speed, global position coordinates, or load weight restrictions,” at paragraph 40, as alleged “restrictions” “sent with the request to generate a virtual key.” EX1003, ¶¶ 119-120. I disagree with this opinion. At paragraph 40, Kleve describes steps 214, 216, 218 and 220. EX1004, ¶ 40. Kleve teaches that each of these steps proceed after the set up and distribution of the virtual key. *Id.*, ¶ 40, Fig. 2.

72. I note that at paragraph 40, Kleve describes step 214 as the first step in which “the Owner may have access to control usage of the vehicle being rented by the Temporary User,” Kleve describes how “the Owner may set user restrictions” for controlling usage of those restrictions, and Kleve teaches when those restrictions may be “initially set”—“at the beginning of the rental term,” but not at any time prior. *Id.*, ¶¶ 40-43.

73. Dr. Almeroth further cites to a “destination location” as a “restriction” allegedly “sent with the request to generate a virtual key.” EX1003, ¶¶ 119-120. I disagree with this opinion. This “destination location,” among other “set rental restrictions” set forth in Kleve paragraph 51, is set by the Owner, monitored by the vehicle and controlled via remedial actions, according to steps 214, 216, 218, and 220. EX1004, ¶¶ 51, 46, 40. Kleve teaches that these “set rental restrictions” are input by the Owner after the set up and distribution of the virtual key, since they are “initially set ... at the beginning of the rental term,” and therefore cannot be sent or “include[d]” as an alleged “condition of use” in any set up or distribution of that virtual key. *Id.*, ¶¶ 51, 43, Fig. 2; EX1001, claims 1[a], 16[a], 19[a].

74. I also disagree with Dr. Almeroth’s opinion that “prohibited areas where the owner does not want their vehicle to be used” is a “restriction[] sent with the request to generate a virtual key.” EX1003, ¶¶ 119-120. At paragraph 73, Kleve refers to “prohibited areas” as among the “parameters” that may be monitored during

the Temporary User's utilization of the vehicle—these are the same “parameters” used to set restrictions at step 214. EX1004 ¶ 73; *id.*, ¶ 40. Kleve teaches that these restrictions may “enforce compliance with the rental agreement terms,” but are not set by the Owner until step 214, at “the beginning of the rental term,” which is after the set up and distribution of a virtual key. *Id.*; *id.*, ¶¶ 51, 43, Figs. 2, 7A.

75. I disagree with Dr. Almeroth's allegation that “top vehicle speed, limiting the cargo load, and alerting the vehicle owner if the driver enters an area deemed to be prohibited by the owner” are “restrictions [that] are sent with the request to generate a virtual key.” EX1003, ¶¶ 119-120. At paragraph 75, Kleve describes the vehicle's “monitoring process,” in which the VCS uses the restrictions or limits that were already “chosen by VO [the Vehicle Owner]” at step 214, to monitor and report vehicle usage. EX1004, Figs. 7A, 2, ¶¶ 75, 40. At paragraph 75, Kleve reiterates that any restrictions which will be monitored or controlled by the VCS are “assigned by the Vehicle Owner at the start of the rental period.” *Id.*, ¶ 75. Specifically, Kleve teaches that it is only after the Temporary User has initiated the rental event with the virtual key, which is after the Temporary User has already accessed the vehicle, that the vehicle's VCS system will “download performance limitations and restrictions *assigned by the Vehicle Owner at the start of the rental period*, at step 708.” *Id.*, ¶ 75 (emphases added), Fig. 7A.

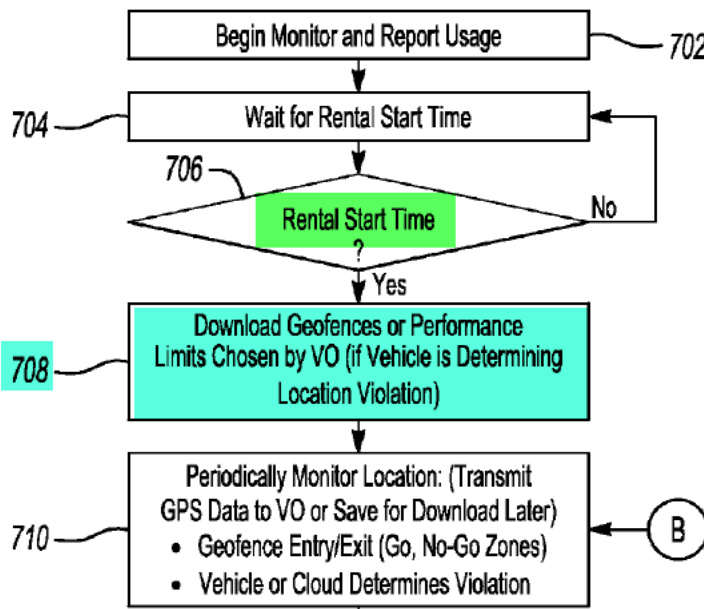


Fig-7A

71A

Id., Fig. 7A (annot.).

76. It is my opinion that none of the alleged “restrictions” identified by Petitioners and Dr. Almeroth “are sent with the request to generate a virtual key.” Pet. 15 (citing EX1004, ¶¶ 38, 40, 51, 73, 75); EX1003, ¶¶ 119-120 (same).

2. **Kleve’s disclosure that a virtual key credential may be “sent to the vehicle configuring the VCS to enable the keyless drive system for the appropriate Temporary User during a given rental period” does not suggest the “rental period” is included in the virtual key itself.**

77. It is my opinion that Kleve’s disclosure that a virtual key credential may be “sent to the vehicle configuring the VCS to enable the keyless drive system for the appropriate Temporary User during a given rental period” does not teach or suggest the “rental period” is included in the virtual key. *See* EX1004, ¶ 39. Instead, as I discussed in Section VII above, Kleve’s system includes solutions for the Owner

to allow access and/or a drive-away, during the rental period, without having “the rental period” included in the set up or distribution of a virtual key.

78. For example, as I noted in Section VII above, rental agreement terms may be agreed to after the virtual key has been created and distributed, and after the Temporary User has used the virtual key to access the vehicle to “agree to rental terms” in the vehicle. *Id.*, ¶ 65. Accordingly, rental agreement terms, such as the “rental period” cannot be a “condition of use” included in the set up or distribution of the virtual key if the Temporary User already had and used the virtual key before agreeing to rental terms. *Id.*, ¶¶ 65, 67.

79. Additionally, I note that Kleve is not suggesting that the virtual key itself enforces compliance with rental agreement terms where Kleve instructs that the Temporary User may “agree to rental terms” after the virtual key has already been created, already been distributed to the Temporary User, and already used by the Temporary User to access the Owner’s vehicle. *Id.*; *id.*, ¶¶ 43, 51, 75, Fig. 7A.

80. Instead, Kleve’s system will monitor and control usage—that is, enforce compliance with rental agreement terms—according to the “vehicle restriction limits initially set by the Owner at the beginning of the rental term.” *Id.*

81. I disagree with Dr. Almeroth’s statement that Kleve’s virtual key is “always generated after the rental agreement.” EX1003, ¶ 120. As I discussed above, Kleve teaches that a virtual key may be created and distributed to the Temporary

User, and used by the Temporary User to access the vehicle before the Temporary User agrees to rental terms. EX1004, ¶¶ 65, 67; Pet. 10-11.

82. I also described in Section VII above Kleve's teaching that the Vehicle Owner send the virtual key credential "at rental time." This would be unnecessary were the "rental period" itself already included as a condition of use in the request for, or distribution of, a virtual key. EX1004, Fig. 5, ¶¶ 48, 66-67.

83. Kleve's virtual key is not only operable during the agreed-to rental period because, as I discussed in Section VII above, Kleve provides several examples in which the VCS's monitoring and control of the Owner's set use restrictions wherein the system may terminate a virtual key either before or after an agreed-to rental period, and extend a rental end time by updating a rental end time restriction. These examples include, for instance, (1) the virtual key is terminated before a rental end time, e.g., due to extreme usage which exceeds a "user restriction" set after the set up and distribution of the virtual key (*id.*, ¶ 53, Fig. 3B) or due to a detected accident (*id.*, ¶¶ 79, 53, Fig. 7B), (2) the rental period end time may be updated where extended time is purchased and authorized (*id.*, ¶ 43, Fig. 2), and (3) the virtual key is terminated *after* the agreed upon rental period has expired (*id.*, ¶¶ 43, 53-55, 79-80). Kleve's solution enforces the end of the rental period, not by including the agreed upon period into the virtual key itself, but by the Owner's

input, at the beginning of a rental term, of a “rental period end time restriction.” *Id.*, ¶ 43.

3. Dr. Almeroth’s obviousness opinions are contradicted by Kleve’s disclosures.

84. I disagree with Dr. Almeroth’s opinion that “a POSITA would have understood that the rental agreement restrictions are also sent with the request so that the virtual key could be associated with said restrictions.” EX1003, ¶ 120. Kleve’s solution “associates” the “user restrictions”—initially set by the Vehicle Owner at the beginning of the rental term—with the system’s functions to control, monitor and update restrictions, via steps 214, 216, 218, 220, 224, and 226. EX1004, ¶¶ 40-43, Fig. 2. Kleve’s system already allows the Owner, by setting “user restrictions,” the discretion and control over when the virtual key will be terminated, regardless of any rental agreement terms, and regardless of the virtual key lacking any “conditions of use.” *Id.*, *id.*, ¶ 51.

85. Dr. Almeroth fails to offer any benefit that would be achieved by “associating” Kleve’s restrictions with its virtual key in addition to Kleve’s existing solution to control usage according to restrictions initially set at the beginning of the rental term. EX1003, ¶ 120.

86. Dr. Almeroth also fails to explain how his proposed modification to Kleve’s virtual key, to associate restrictions from the parties’ agreed-upon rental

agreement, would ensure the Owner retains the full discretion and control over vehicle usage, which is already taught by Kleve's solution. *See id.*

87. I disagree with Dr. Almeroth's opinion that "the rental agreement restrictions are also sent with the request in order that the generated virtual key can be associated with such restrictions, which allows the restrictions to be monitored and enforced." EX1003, ¶ 121. Kleve's system already "allows restrictions to be monitored and enforced;" for example, Kleve's system monitors and enforces the "user restrictions" that are initially set by the Owner at step 214. EX1004, ¶¶ 40-43, 51, Fig. 2.

88. I disagree with Dr. Almeroth's opinion that including restrictions with the virtual key request "allows the server to monitor and enforce the restrictions, which, as I mentioned above are important aspects of Kleve's system." EX1003, ¶ 122. Dr. Almeroth fails to explain any additional benefit achieved by this proposed modification, since Kleve already "allows" the monitoring and enforcement of the "user restrictions" initially set by the Vehicle Owner at the beginning of the rental term, and Kleve's solution further allows the Vehicle Owner to receive notifications regarding violations of those user restrictions. EX1004, ¶¶ 40-43, 51.

89. I also disagree with Dr. Almeroth's opinion that "a POSITA would have been motivated by the well-known benefits of monitoring and enforcement, including increased reliability and efficient [sic] of the rental system by encouraging

and inducing renters to comply with the restrictions or pay a penalty if the restrictions are violated.” EX1003, ¶ 122. Kleve’s system already provides an opportunity for the parties to sign a “rental contract” (EX1004, ¶¶ 85, 90), and Kleve further allows a Vehicle Owner to “enforce compliance with the rental agreement terms,” as well as additional restrictions, by inputting “user restrictions” that will be monitored and controlled by the VCS (*id.*, ¶¶ 51, 40-43, Fig. 2). Dr. Almeroth does not provide an explanation as to why, despite Kleve’s preexisting solution “to enforce compliance with the rental agreement terms,” in addition to monitoring and controlling other Owner-set restrictions, a POSITA would be motivated to “increase[] reliability and efficien[cy]” by adding a second means of “monitoring and enforcement” to Kleve’s solution.

90. I disagree with Dr. Almeroth proposed modification to “include the restrictions with the virtual key request,” “because that would provide the well-known benefits of associating the virtual key with the restrictions such that the central system knows which restrictions must be enforced with which virtual keys.” EX1003, ¶ 122. As I mentioned above, Kleve’s system enforces the restrictions input by the Owner, at step 214, and any “control parameters” on which those restrictions may be based. *E.g.*, EX1004, ¶¶ 40-41, 51, Figs. 2, 3B, 7A, 7B. Therefore, Kleve’s system already “knows which restrictions must be enforced,” according to each of the “user restrictions” input by the Vehicle Owner, such as the rental period end time

restriction input by the Vehicle Owner and any speed and load weight restrictions set by the Owner *Id.* Kleve’s system enforces these restrictions and parameters by “remedial actions” undertaken by the vehicle’s VCS. *Id.* Dr. Almeroth fails to point to any teaching in the reference or any other motivation to modify Kleve to include another means of enforcing restrictions, i.e., by including restrictions in the virtual key. EX1003, ¶ 122.

91. I also disagree with Dr. Almeroth’s proposed modification to include restrictions, such as rental agreement terms, in Kleve’s virtual key because such a modification would ignore Kleve’s intent and rationale to have the Vehicle Owner, but only the Vehicle Owner, set restrictions that will be monitored and controlled by the vehicle’s VCS.

92. By contrast to Kleve’s teachings that both the Vehicle Owner and the Temporary User may negotiate and agree to the terms of the rental agreement (EX1004, ¶¶ 38, 84, 89), Kleve is consistent in teaching that only the Vehicle Owner may utilize the control the “monitoring” and “control usage” features of Kleve’s system by inputting user restrictions (*id.*, ¶¶ 40-41, 51, Figs. 2, 7A). *Id.*, ¶¶ 51, 43 (restriction limits initially set *by the Owner* at the beginning of the rental term”), 75 (“restrictions assigned *by the Vehicle Owner* at the start of the rental period”). For example, Kleve teaches that “performance limits *chosen by the VO [Vehicle Owner]*” (*id.*, Fig. 7A) (emphasis added) are downloaded by the vehicle, and

monitored by the vehicle, “alerting the vehicle owner if the driver enters an area *deemed to be prohibited by the owner*” (*id.*, ¶ 75). Also as I discussed in Section VII above, Kleve provides a rationale for this design, explaining, “[c]ontrolling usage to enforce compliance with the rental agreement terms may be of more importance to a vehicle rental micro-business owner as this may be the only vehicle the Owner possesses.” *Id.*, ¶ 51. Kleve discloses that “the monitoring of the vehicle’s location may be done to reassure the Vehicle Owner that their asset is being driven in an approved manner and area.” *Id.*, ¶ 76.

B. Because Kleve fails to disclose or suggest the “condition of use” recited in claims 1[a], 16[a] and 19[a], the Petition fails to show the recited “the condition of use” of elements 1[b], 16[b] and 19[b].

93. It is my opinion that Kleve fails to teach or suggest “generating, by the server, the e-key, the e-key being assigned with the condition of use of the vehicle,” as required by elements 1[b] and 19[b] or “generating, by the server, the e-key, the e-key being associated with the condition of use of the vehicle,” as recited by element 16[b]. EX1001, claim elements 1[b], 16[b], 19[b]. I note that for both grounds 1 and 2, Petitioners rely on Kleve alone for alleged disclosure of the recited “condition of use of the vehicle” and Petitioners cite to the very same “restrictions” of Kleve, as discussed above with respect to elements 1[a], 16[a] and 19[a]. However, as I discussed above, Kleve teaches that its “user restrictions” on which monitoring and control of vehicle usage are based, are set “initially” at the beginning

of the rental term, which is after the creation and distribution of Kleve's virtual key. Accordingly, Petitioners fail to show that Kleve teaches or suggests the antecedent "the condition of use of the vehicle" for elements 1[b] / 16[b] / 19[b]. *Id.*

94. For ground 2, Petitioners propose to add the Sekiyama reference for alleged disclosure of a server's generation of an e-key, but even if Sekiyama did disclose that limitation, Petitioners still rely on Kleve alone for the recited "the e-key being assigned / associated with *the condition of use of the vehicle*." Pet. 16 (ground 1, element 1[b]), 36-37 (ground 2, element 1[b]); Pet. 35 ("[t]o the extent that PO argues Kleve's server does not generate e-keys..."), 37 ("Sekiyama discloses a server that generates an e-key").

95. As I discussed in Sections VII, IX above, Petitioners have failed to show that Kleve's "restrictions" are included in any virtual key, nor is the generated virtual key assigned with or associated with such restrictions. It is my opinion that Petitioners' addition of the Mottla and Patenaude references for grounds 3 and 7 do not cure Kleve's failure for this element, and I note that Petitioners offer no argument or analysis to the contrary.

C. Kleve fails to disclose or suggest a server examining inputs or settings to "identify patterns," nor any server "learning the patterns ... to provide recommendations to the recipient ...," as recited by Claim 17.

96. It is my opinion that the Petitioners and Dr. Almeroth have failed to show that Kleve teaches or suggests dependent claim 17. I note that Petitioners and

Dr. Almeroth point to *Kleve*'s "stored frequent destinations," along with "radio presets, and seat and mirror position" to argue that the recited limitations of claim 17 are met, but *Kleve*'s disclosures of "stored frequent destinations" are disclosed as the Temporary User's "vehicle preset settings," "preset" by the User and transferred directly from the User's phone. EX1004, ¶¶ 50, 72. Accordingly, these "preset settings" do not disclose or suggest that "inputs or settings" had been "examined to identify patterns," nor a server "learning the patterns" to provide recommendations ... for settings," as recited in claim 17. *Id.*, EX1001, 51:39-47.

97. I disagree with Dr. Almeroth opinion that *Kleve*'s "frequent destinations" (EX1004, ¶ 50) is "indicative of settings made during use with the e-key," (EX1003, ¶170). In fact, *Kleve* teaches the opposite. *Kleve* teaches that "frequent destination" are "preset settings" as opposed to settings "made during use with the e-key." EX1004, ¶ 50; EX1001, claim 17. I note that *Kleve*'s use of the term "preset" to describe "preset settings" indicates that these settings were "preset" when transferred to the vehicle. EX1004, ¶ 50.

98. *Kleve* does not teach or suggest any server operation involving the examining or learning or recommending of these "preset settings," such as "frequent destinations." *Id.*; *id.* ¶ 72. Instead, *Kleve* teaches that the Temporary User's settings are sent to the vehicle when the Temporary User pairs their nomadic device (e.g. mobile phone) with the VCS of the vehicle. *Id.* ¶ 72.

99. I disagree with Dr. Almeroth's opinion that "Kleve discloses that the server can provide stored frequent destinations sent to the [vehicle]." EX1003, ¶ 171. Kleve does not disclose or suggest the server "storing" the Temporary User's settings. Instead, Kleve instructs that these preset settings are transferred directly from the Temporary User's phone, by pairing the nomadic device to the vehicle's VCS. EX1004, ¶ 72.

100. I disagree with Dr. Almeroth's conclusion that "a POSITA would have considered it obvious for the server to identify patterns in the vehicle location data to learn frequent destinations." EX1003, ¶ 171. Kleve teaches away from this conclusion, and as I discussed above, Kleve relies instead on the Temporary User to already have "preset settings," which are stored to the nomadic device or phone, and directly transferred to the vehicle from that phone. EX1004, ¶¶ 50, 72. Moreover, Kleve teaches that the Temporary User's stored "navigation routes," saved to their phone, are to be sent to the vehicle when the Temporary User pairs their phone with the vehicle's VCS. EX1004, ¶ 72. This, too, supports the conclusion that the "stored frequent destinations" relied upon by Dr. Almeroth are stored on the Temporary User's phone, like stored "navigation routes," and then transferred as "preset settings" to the vehicle upon pairing the phone with the vehicle.

D. The Additional References Do Not Cure the Deficiencies of Kleve.

101. For Grounds 2-3 and 7, Dr. Almeroth proposes adding different references in combination with Kleve. However, Dr. Almeroth only proposes doing so as related to other limitations of the independent claims, rather than those discussed above, or as related to the dependent claims of the '188 patent. The added references do not cure any deficiencies of Kleve (or Sekiyama) discussed above, and Dr. Almeroth offers no opinion to the contrary.

X. DR. ALMEROOTH AND THE PETITION FAIL TO SHOW THAT ZAID, ALONE OR IN COMBINATION, DISCLOSES OR SUGGESTS A “REQUEST FROM A USER VIA A USER ACCOUNT ... TO GENERATE AN ELECTRONIC KEY.”

102. In my opinion, Dr. Almeroth does not demonstrate that a POSITA would have understood Zaid, alone or in combination with Harris, to disclose or suggest a server receiving “a request from a user via a user account ... to generate an electronic key (e-key),” as recited by the independent claims. EX1001, claims 1, 16, 19.

103. Dr. Almeroth identifies Zaid’s server’s receipt of a vehicle reservation as the claimed “request ... to generate an electronic (e-key),” but, as described above, Zaid’s “reservation” is just that—it reserves a vehicle, authorizing a user to thereafter control the vehicle. EX1008, ¶ 124.

104. As I described above, Zaid discloses that a user may book a reservation for a vehicle at a central server, and because the central server does not have direct communication with the vehicle, the reservation information is passed to a wireless communication device through an encrypted message. EX1008, ¶¶ 70, 125. Zaid instructs that first, “a reservation for a vehicle is received from a wireless communication device,” then, “vehicle access is provided based on the reservation.” *Id.*, ¶ 124.

105. A POSITA would understand that the functionality of the server passing along a message regarding a reservation for a vehicle does not suggest or teach a request received by a server to generate an electronic key for use by the mobile device.

106. Dr. Almeroth contends that “Zaid discloses that the encrypted reservation is an e-key that is sent to the recipient to allow use of the vehicle.” EX1003, ¶ 213. I disagree with Dr. Almeroth’s conclusion. First, Zaid passes along a rental reservation as a “verified communication” to a user, but does not disclose generating an e-key. EX1008, ¶¶ 125-127. Zaid actually confirms that instructions for car entry, such as unlocking doors, are received through direct commands, not just passing through reservation requests. EX1008, ¶ 100. For example, Zaid discloses that after the vehicle receives the reservation, the wireless communication device may send commands to unlock the car. *Id.*

107. Additionally, Dr. Almeroth and the Petition do not demonstrate that Zaid's use of an encrypted message, relayed by a server, discloses or suggests the generation of an e-key. Instead, Zaid teaches that the encrypting and decrypting of data is for "verified communication"—e.g., using encryption to convert a reservation from one form to another.

108. In asymmetric cryptography, such as that discussed in Zaid, an entity has two keys: a private key and a public key. EX1008, ¶¶ 65-66. Any information encrypted using the private key can be decrypted only using the corresponding public key, and conversely, any information encrypted using the public key can be decrypted only using the private key. As the names suggest, private keys are intended to be kept secret, while public keys are intended to be shared openly. Asymmetric cryptography can be used to achieve confidentiality or authentication. A message encrypted using an entity's public key is only readable by that entity, since only that entity has the private key to decrypt the message, ensuring confidentiality of that message. A message encrypted using an entity's private key can be read by anyone that has the entity's public key, but ensures the authenticity of that message, because only that entity has the private key to create such a message.

109. Zaid discloses that after receiving a message, the wireless communication device decrypts the first layer of encryption using the public key of the wireless communication device using a locally stored private key of the wireless

communication device. In various embodiments, decryption is used to ensure and authenticate that the intended wireless communication device is receiving the vehicle reservation rather than one that intercepts the vehicle reservation. EX1008, ¶ 126. Zaid is disclosing the wireless device decrypting a received message using its private key, thus ensuring that only the wireless device can read the message and further protecting against a situation in which the message is intercepted by another device. As I discussed above, a POSITA would not understand this to disclose or suggest a server generating an e-key to use the vehicle, as required by the claims.

XI. DR. ALMEROTH AND THE PETITION FAIL TO SHOW THAT Zaid, ALONE OR IN COMBINATION, DISCLOSES OR SUGGESTS A SERVER RECEIVING “A REQUEST FROM A USER VIA A USER ACCOUNT THAT HAS A VEHICLE ASSOCIATED THEREWITH ... TO GENERATE AN ELECTRONIC KEY ... THE REQUEST INCLUDES A CONDITION OF USE OF THE VEHICLE AS SET BY THE USER VIA THE USER ACCOUNT.”

110. Each of the independent claims of the '188 patent require a server receiving a request that is not only “*from* a user via a user account that has a vehicle associated therewith” but also that the request’s inclusion of “a condition of use of the vehicle” must be “set by *the user*” who made the request to generate the e-key and the condition of use must also be set via “*the user account*” from which the request was made. EX1001, claims 1, 16, 19. Therefore, even if Zaid’s reservation could suggest the recited request to generate an e-key (in my opinion, it does not, for the reasons stated above), each of the grounds relying on Zaid (grounds 4-6) still fail

because Zaid fails to teach any “request from a user via a user account that has a vehicle associated therewith ... to generate an electronic key” or a “request [that] includes a condition of use of the vehicle as set by the user via the user account,” as required by the claims. EX1001, claims 1, 16, 19.

A. Zaid does not disclose or suggest any “user account” via which a user requests a server to generate an e-key.

111. Dr. Almeroth contends that “Zaid discloses or renders obvious a vehicle owner (*user*) that can use a *user account* (such as through [F]acebook) to facilitate a vehicle rental reservation that causes the server to generate an encrypted reservation (*e-key*) to allow an identified user (*identified recipient*) to use the owner’s vehicle.” EX1003, ¶ 204 (emphases in original).

112. Dr. Almeroth alleges Zaid’s “vehicle rental reservation” is alleged to be the claims’ recited “request ... to generate an [] e-key,” and he concludes that this request is made via a “user account” “such as through Facebook,” but Dr. Almeroth fails to identify any disclosure or otherwise show that the alleged server receives a request to generate an e-key (1) via that “user account,” nor (2) “via a user account that has a vehicle associated therewith.” And, in any event, the “Facebook” account described by Zaid is that of the renter, not the vehicle owner, as Dr. Almeroth claims. EX1008, ¶ 72; EX1003, ¶¶ 206-210.

113. Dr. Almeroth contends that “a POSITA would understand that the vehicle reservation request is sent to the server from the owner’s user account. It is the owner who advertises when the vehicle is available for reservation, and it is the owner who has ‘control over the type of user the owner is lending/sharing/renting vehicle to.’” EX1003, ¶ 210 (citing EX1008, ¶¶ 72, 77). Dr. Almeroth further concludes, “a POSITA would therefore understand that the reservation request to the server comes from the owner through the owner’s account.” EX1003, ¶ 210. I disagree with these conclusions for several reasons.

114. First, Zaid instructs that a vehicle owner can advertise their vehicle on social networking sites, such as Facebook, but here Zaid describes a renter of the vehicle—not the vehicle owner—that “must first log into the social networking website before he/she can view the advertisement and make [sic, a] reservation.” EX1008, ¶72. For example, Zaid describes logging into an account, such as Facebook, to view an advertisement and “make [a] reservation.” EX1008, ¶ 72. *Advertising* on social networking sites, such as Facebook, was common at the time of the invention, and a POSITA would understand that social networking sites allowed advertisers to track data of account users who, e.g., “view the advertisement” and click on such an ad, e.g., to “make [a] reservation.” *See* EX1008, ¶72. Therefore, contrary to Dr. Almeroth’s conclusions, a POSITA would understand from these disclosures that a vehicle owner may have an advertisement

of their vehicle on others' Facebook accounts, and may even obtain data to maintain some "control over the type of user the owner is lending/sharing/renting [a] vehicle to," but when a user clicks on that ad to "make a reservation," there is no reason to conclude this reservation is *from the owner via the owner's account*, the alleged "user account." EX1003, ¶¶ 206-212. Dr. Almeroth draws the conclusion that "because the owner advertises when the vehicle is available for reservation, and the owner has 'control over the type of user the owner is lending/sharing/renting [a] vehicle to'" "[a] POSITA would understand that the vehicle reservation request is sent to the server from the owner's user account." EX1003, ¶ 210. But, as shown above, Zaid discloses the opposite.

115. A POSITA would not understand Zaid as teaching or suggesting that *an advertiser/owner*—whether or not they obtain tracking data for the account user who clicks on the ad—"must first log into the social networking website before he/she can view the advertisement" of their own vehicle, or require an advertiser/owner to "first log into" their own Facebook account to "make [a] reservation" of their own advertised vehicle. EX1008, ¶ 72.

116. Dr. Almeroth presents an alternative theory that "a POSITA would have found it obvious that the reservation request is sent by the owner through the owner's account ... [s]ince both the renter and the owner accounts are involved in making the reservation[.]" EX1003, ¶ 211. But the identified disclosures of Zaid do not refer

to an “owner account,” nor any “user account that has a vehicle associated therewith,” and instead describe *a renter* who “must first log into the social networking website before he/she can view the advertisement and make [a] reservation.” EX1008, ¶ 72. I also disagree with Dr. Almeroth’s conclusion that Zaid presents “a mere design choice” of “whether the reservation request is sent by the renter or the owner.” EX1003, ¶ 211. In fact, Zaid never mentions or suggests any *owner account* from which such a reservation request can be made, let alone any “user account that has a vehicle associated therewith” from which such a reservation can be made. EX1008; EX1001.

117. Dr. Almeroth incorrectly states that “Zaid already discloses that the vehicle reservation application can be accessed ‘through one or more social networking websites, such as FourSquare and Facebook,’ where the ‘user must first log into the social networking website.’” EX1003, ¶ 206 (citing EX1008, ¶ 72). However, paragraph 72 of Zaid makes no such disclosure. EX1008, ¶ 72. Zaid does not disclose any “vehicle reservation application” that can be accessed through such social networking websites,” but instead describes a person being able to view an advertisement and make a reservation after logging into such social networking websites. *Id.*

118. Dr. Almeroth presents another theory that “[a] POSITA would consider it obvious for an owner to access the rental application through a user account to

associate their vehicle with the account.” EX1003, ¶ 206. Again, the relied on “user account” of Zaid refers to the renter’s Facebook account or other social networking website account, not the owner’s. EX1008, ¶ 72. And regardless, Dr. Almeroth identified the “reservation” made via social networking websites, not any “reservation” via a “vehicle rental application” as the alleged “request ... to generate an electronic key” and Zaid’s disclosed *rental application* offers no means by which to “make [any] reservation,” let alone make a request to a server to generate an e-key. EX1008, ¶ 77; EX1001, claims 1, 16, 19. Zaid instructs that its rental application enables updates to be “announce[d]” and “advertise[d],” such as the location of the vehicle or when it will be available for sharing, but does not offer any disclosure or suggest that this is a user account via which a user can make a request to generate an e-key. *Id.*

B. Dr. Almeroth and the Petition fail to show that Zaid discloses or suggests “the request includes a condition of use of the vehicle as set by the user via the user account.”

119. Claim elements 1[a] / 16[a] / 19[a] each recite that *the same request* to generate an e-key also “includes” a condition of use (“a request ... the request includes...”), *the same user* makes the request and sets the condition of use (“request from a user ... set by the user”), and it is *the same user account* via which the request is made and the condition is set (“via a user account ... as set ... via the user account”). EX1001, claims 1, 16, 19. However, Dr. Almeroth points to different

“user accounts,” different “users,” and different “requests,” as alleged disclosures rendering this limitation obvious.

120. For example, as explained above, as a “user account” via which the claimed request is made, Dr. Almeroth points to Zaid’s disclosure of a renter logging into their Facebook account to view an advertisement and “make [a] reservation.” EX1008, ¶ 72. However, for the claims’ recited “condition of use is set by the user *via the user account*,” Dr. Almeroth contends this is set “when the owner ‘announces when the vehicle is available for sharing.’” EX1003, ¶ 210 (citing EX1008, ¶ 77). Paragraph 77 describes an application in which an owner or renter can advertise or announce updated information, such as a location or when the vehicle is returned, but Zaid does not suggest that this “application” is the Facebook or social networking account that Dr. Almeroth identified as allegedly satisfying “a user account,” and therefore cannot be “*the user account*” via which the user sets a condition of use for the vehicle. EX1008, ¶ 77; EX1001. Here, Dr. Almeroth points to a reservation made via Facebook advertisements or those on similar social networking sites, but for the same “user account” via which a condition for use is set by the user, Dr. Almeroth points to an unrelated “vehicle rental application” where announcements, updates and other advertisements can be made. *E.g.*, EX1003, ¶¶ 206, 210, 219. Zaid does not suggest that this “application” has the reservation feature pointed to by Dr. Almeroth as the alleged “request ... to generate an [] e-

key,” nor does this application suggest any functionality wherein a user can make “a request ... to generate an [] e-key” to a server. EX1008, ¶ 77; EX1001.

121. Additionally, Dr. Almeroth fails to offer any teaching or suggestion in Zaid that an owner making an “announcement” via a “vehicle reservation application” can enable a user to “set a condition of use for a vehicle” which can be included in a request to generate an e-key. EX1008, ¶ 77.

122. Dr. Almeroth also points to different “users” as involved in making the same request, e.g. *the renter* who *makes a reservation* (alleged to be the “request [to the server] ... to generate an [] e-key”) and *the “owner* [who] ‘announces when the vehicle is available for sharing’” (alleged to be “the request includes a condition of use as set by the user via the user account”). EX1003, ¶¶ 206, 219. These two different individuals cannot be the same “a user” and “the user” recited by claim elements 1[a] / 16[a] / 19[a]. In any event, Zaid offers no teaching or suggestion that any user can utilize either a social networking website or a vehicle rental application to set a condition for use of the vehicle to both request that a server “generate an [] e-key,” and to “set a condition of use of the vehicle,” as the claims require. EX1001.

XII. THE ADDITIONAL REFERENCES DO NOT CURE THE DEFICIENCIES OF ZAID.

123. For grounds 4-6, Dr. Almeroth proposes adding different references in combination with Zaid. However, Dr. Almeroth only proposes doing so as related to

different limitations of the independent claims than those discussed above, or as related to dependent claims of the '188 patent. The added references do not cure any deficiencies of Zaid discussed above, and Dr. Almeroth offers no opinion to the contrary.

XIII. **CONCLUSION**

124. This declaration reflects my opinions as currently held. However, my analysis may continue such that I may consider additional information that may result in additional observations.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed this 14th day of April, 2025, at Irvine, California .

A handwritten signature in black ink, appearing to read "Sam Malek", is written over a horizontal line.

Dr. Sam Malek